

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Réception des soumissions - TPSGC / Bid
Receiving - PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet Joint intelligence and information		
Solicitation No. - N° de l'invitation W7701-125076/A	Date 2013-03-08	
Client Reference No. - N° de référence du client W7701-12-5076		
GETS Reference No. - N° de référence de SEAG PW-\$QCL-018-15280		
File No. - N° de dossier QCL-1-34958 (018)	CCC No./N° CCC - FMS No./N° VME	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-05-01		Time Zone Fuseau horaire Heure Avancée de l'Est HAE
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>		
Address Enquiries to: - Adresser toutes questions à: Piras, Gabriel		Buyer Id - Id de l'acheteur qcl018
Telephone No. - N° de téléphone (418) 649-2870 ()		FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: R & D POUR LA DEFENSE CANADA VALCARTIER BATIMENT 53 2459 BLVD PIE XI NORD QUEBEC Québec G3J1X5 Canada		

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Issuing Office - Bureau de distribution

TPSGC/PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

TITLE : DEVELOPMENT OF A JOINT INTELLIGENCE AND INFORMATION S&T CAPABILITY**TABLE OF CONTENTS****PART 1 - GENERAL INFORMATION**

1. Introduction
2. Summary
3. Debriefings

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions
2. Submission of Bids
3. Enquiries - Bid Solicitation
4. Applicable Laws
5. Basis for Canada's Ownership of Intellectual Property

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions:
 - Section I : Technical Bid
 - Section II : Financial Bid
 - Section III : Certifications

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures
2. Basis of Selection

PART 5 - CERTIFICATIONS

1. Mandatory Certifications Required Precedent to Contract Award
2. Certifications Precedent to Contract Award

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement
2. Financial Capability
3. Controlled Goods Requirement

PART 7 - RESULTING CONTRACT CLAUSES

1. Requirement
2. Standard Clauses and Conditions
3. Security Requirement
4. Term of Contract
5. Authorities
6. Payment

7. Invoicing Instructions
8. Certifications
9. Applicable Laws
10. Priority of Documents
11. Defence Contract
12. Foreign Nationals (Canadian Contractor)
13. Insurance
14. Controlled Goods Program
15. Joint Venture Contractor
16. Progress Reports
17. Site Regulations
18. Identification Badge
19. Representations and Warranties
20. Access to Canada's Property and Facilities

List of Annexes:

- | | |
|---------|---|
| Annex A | Statement of Work or Requirement |
| Annex B | Basis of Payment |
| Annex C | Contractor Disclosure of Foreground Information |
| Annex D | Non-disclosure Agreement |
| Annex E | Security Requirements Check List |
| Annex F | DND 626, Task Authorization Form |

List of Attachments:

- | | |
|--------------|--|
| Attachment 1 | Evaluation of Price |
| Attachment 2 | Mandatory and Point Rated Technical Criteria |

PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation and resulting contract document is divided into seven parts plus attachments and annexes as follows:

Part 1 General Information: provides a general description of the requirement;

Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation and states that the Bidder agrees to be bound by the clauses and conditions contained in all parts of the bid solicitation;

Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;

Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, if applicable, and the basis of selection;

Part 5 Certifications: includes the certifications to be provided;

Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by bidders; and

Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include :

Annex A	Statement of Work
Annex B	Basis of Payment
Annex C	Contractor Disclosure of Foreground Information
Annex D	Non-disclosure Agreement
Annex E	Security Requirements Check List
Annex F	DND 626, Task Authorization Form

The Attachments include :

Attachment 1	Evaluation of Price
Attachment 2	Mandatory and Point Rated Technical Criteria

2. Summary

IMPORTANT NOTICE: New measures related to Code of Conduct and certifications included in the solicitation documents require attention.

Defence R&D Canada (DRDC) is working with the Department of National defence (DND) to develop the Strategic Capability Roadmap which will outline the capabilities the Canadian Forces (CF) will require over the next 20 years to be able to carry out their anticipated missions. The Command, Control and Intelligence (C2I) Section at DRDC Valcartier is seeking industry support for a long-term R&D effort for its Future Intelligence Analysis Capability (FIAC) R&D Program. FIAC seeks to address the exacting demands of intelligence in the modern operating terrain and the expanding uncertainties that the CF are

facing, as exemplified in the Joint, Interagency, Multinational, Public (JIMP)¹. To demonstrate future concepts for 'Intelligence Analysis', it will be necessary to exploit and develop expertise in a broad range of science and technology areas – within government, industry and academia.

The work to be performed is the provision of S&T services to DRDC on an as and when requested basis to extend the scientific background and knowledge base related to Intelligence, and to analyse, design, develop, exploit, and support FIAC- related components. The primary objective of the Contract is to develop a Joint Intelligence and Information S&T Capability (FIAC – Spiral 1).

DRDC Valcartier seeks a Contractor - or Consortium - to contribute to the C2I Section's S&T capability development and management in all four (4) capability dimensions:

- infrastructure, equipment, and tools to conduct the S&T research;
- quality of the expertise and knowledge of the scientific staff;
- management of the S&T Capability and its R&D programs, namely Research, Technology and Analysis Program (RTA) and Development, Engineering and Evaluation Program (DEE); and,
- internal and external partnerships and collaborations.

In the context of this requirement, the Contractor will have to contribute to the full range of S&T programs within the C2I Section by conducting activities under any one of these S&T programs and defined under the following groups of Tasks:

- FIAC Integration and Project Management, intended to contribute to the FIAC Integration and the management of Contracts projects;
- Infrastructure Development and Maintenance, which relies on the implementation of an appropriate IM/IT environment into a coherent ecosystem and promoting collaboration;
- The Research, Technology and Analysis Program (RTA), which provides focused research activities addressing knowledge generation needs across all departmental core processes, explores and advances emerging technologies at the early to mid-Technology Readiness Levels (TRL 1-6), including technology demonstration, and conducts targeted operational research and analysis to provide support to decision makers across the CF and DND;
- The Development, Engineering and Evaluation Program (DEE), which addresses technologies at the mature end of the TRL spectrum: TRL 6-9 with activities intended to contribute to the full range of DEE initiatives related to "intelligence analysis".

The Contractor will be required to provide resources having expertise in the domains of Science & Technology, System/Software Development, Military Expertise and Project Management.

Typical deliverables to be produced under this Contract concern the areas of Research/Analysis, Project Management, Collaboration, Enterprise Architecture, Performance Evaluation Infrastructure, Domain Analysis, System/Software Development, System / Software Transition/Exploitation, Quality Assessment/Performance Evaluation.

Additional information

The organization for which the services are to be rendered is Defence Research and Development Canada - Valcartier (DRDC - Valcartier).

The period of the Contract is from date of Contract to March 31st, 2018, inclusive.

¹ Mr. Peter Gizewski and Lieutenant-Colonel Michael Rostek, Toward a JIMP-Capable Land Force, Canadian Army Journal Vol. 10.1 Spring 200, http://www.army.forces.gc.ca/caj/documents/vol_10/iss_1/CAJ_vol10.1_09_e.pdf, accessed June 2012, p.12

Estimated amount of available funding for this contract : \$17,350,000.00, Goods and Services Tax and Quebec Sales Tax or Harmonized Sales Tax is extra, if applicable..

Defence Research and Development Canada - Valcartier has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada.

There are no restrictions on the location of the work. Bidders are advised that the scientific team of the C2I S&T capability is situated primarily in Quebec City and the client community in Ottawa. The Contractor could be required to conduct work in either of these geographic locations. Although it is expected that the majority of the work will be conducted at the Contractor's facility, some work must be performed at DND facilities - in particular, work to support existing infrastructure, experimentation and work requiring access to CLASSIFIED material.

There is a security requirement associated with this requirement. For additional information, consult Part 6 - Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses. Bidders should consult the "Security Requirements for PWGSC Bid Solicitations - Instructions for Bidders" (<http://www.tpsgc-pwgsc.gc.ca/app-acq/lc-pl/lc-pl-eng.html#a31>) document on the Departmental Standard Procurement Documents Web site.

Bidders must provide a list of names, or other related information as needed, pursuant to section 01 of Standard Instructions 2003 and 2004.

The requirement is subject to the provisions of the Agreement on Internal Trade (AIT).

The requirement is limited to Canadian goods and/or services.

This procurement is subject to the Controlled Goods Program.

3. Debriefings

After contract award, bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual*

(<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada (PWGSC).

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2012-11-19) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation. If there is a conflict between the provisions of 2003 and this document, this document prevails.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days

Insert: one hundred twenty (120) days

1.1 SACC Manual Clauses

A7035T (2007-05-25), List of Proposed Subcontractors

2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

Due to the nature of the bid solicitation, bids transmitted by facsimile or electronic mail to PWGSC will not be accepted.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority, preferably via email at gabriel.piras@tpsgc-pwgsc.gc.ca, **no later than seven (7) calendar days before the bid closing date**. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is

eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Quebec.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

5. Basis for Canada's Ownership of Intellectual Property

Canada has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada on the following grounds:

The Treasury Board, granted Defence Research and Development Canada exemption from the Treasury Board Policy on "Title to Intellectual Property Arising Under Crown Procurement Contracts"

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

- (a) **Copies of Bid :** Canada requests that bidders provide their bid in separately bound sections as follows:

Section I : Technical Bid (**5** hard copies)
 Section II : Financial Bid (**2** hard copies)
 Section III : Certifications (**1** hard copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

- (b) **Format for Bid :** Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.
- (c) include a title page at the front of each volume of the bid that includes the title, date, bid solicitation number, bidder's name and address and contact information of its representative; and
- (d) include a table of contents.

- (c) **Canada's Policy on Green Procurement :** In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders are encouraged to:

- (1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and
- (2) use an environmentally-preferable format including black and white printing instead of colour printing, print double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

- (d) **Submission of Only One Bid from a Bidding Group:**

- (i) The submission of more than one bid from members of the same bidding group is not permitted in response to this bid solicitation. If members of a bidding group participate in more than one bid, Canada will choose in its discretion which bid to consider.
- (ii) For the purposes of this article, "**bidding group**" means all entities (whether those entities include one or more natural persons, corporations, partnerships, limited liability partnerships, etc.) that are related to one another. Regardless of the jurisdiction where any of the entities concerned is incorporated or otherwise formed as a matter of law, entities are considered "**related**" for the purposes of this bid solicitation if:
 - (A) they are the same legal entity (i.e., the same natural person, corporation, partnership, limited liability partnership, etc.);

- (B) they are "related persons" or "affiliated persons" according to the *Canada Income Tax Act*;
- (C) the entities have now or in the two years before bid closing had a fiduciary relationship with one another (either as a result of an agency arrangement or any other form of fiduciary relationship); or
- (D) the entities otherwise do not deal with one another at arm's length, or each of them does not deal at arm's length with the same third party.

1.1 Section I : Technical Bid

- a) In their technical bid, bidders must demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability in a thorough, concise and clear manner for carrying out the work. The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.
- b) The technical bid consists of the following:
 - (i) **All the information required to demonstrate its conformity with the Mandatory and Point Rated Technical Criteria** described in Sections 1.1.1 and 1.1.2, Part 4, of this document.
 - (ii) **Résumés for Proposed Resources** : The technical bid must include résumés for the "Core Team Resources" identified in the Mandatory Technical Criteria of the bid solicitation that demonstrate that each proposed individual meets the qualification requirements described in Annex A - Statement of Work, Appendix 2 - Category of Resources (including any educational requirements, work experience requirements, and professional designation or membership requirements). With respect to résumés and resources:
 - (A) Proposed resources may be employees of the Bidder or employees of a subcontractor, or these individuals may be independent contractors to whom the Bidder would subcontract a portion of the Work.
 - (B) For educational requirements for a particular degree, designation or certificate, PWGSC will only consider educational programmes that were successfully completed by the resource by the time of bid closing.
 - (C) For requirements relating to professional designation or membership, the resource must have the required designation or membership by the time of bid closing and must continue, where applicable, to be a member in good standing of the profession's governing body throughout the evaluation and Contract Period.
 - (D) For work experience, PWGSC will not consider experience gained as part of an educational programme, except for experience gained through a formal co-operative programme at a post-secondary institution.
 - (E) For any requirements that specify a particular time period (e.g., 2 years) of work experience, PWGSC will disregard any information about

experience if the individual's résumé does not include the relevant dates for the experience claimed (i.e., the start date and end date). Canada will evaluate only the duration that the resource actually worked on a project or projects (from his or her start date to end date), instead of the overall start and end date of a project or a combination of projects in which a resource has participated.

- (F) For work experience to be considered by PWGSC, the résumé must not simply indicate the title of the individual's position, but must demonstrate that the resource has the required work experience by explaining the responsibilities and work performed by the individual while in that position. In situations in which a proposed resource worked at the same time on more than one project, only one project will be counted toward any requirements that relate to the individual's length of experience.

1.2 Section II : Financial Bid

Bidders must submit their financial bid in accordance with the following :

- (a) **Pricing** : Bidders must submit their financial bid in accordance with the Basis of Payment in Annex B. The total amount of Goods and Services Tax or Harmonized Sales Tax must be shown separately, if applicable. Unless otherwise indicated, bidders must include a single, firm, all-inclusive price quoted in Canadian dollars in each cell requiring an entry in the Basis of Payment.
- (b) No travel and living expenses will be paid for services provided within the Quebec Region (including DRDC Valcartier facilities.) Further, Canada will not accept any travel and living expenses for travel between the contractor's place of business and the Quebec region (including DRDC Valcartier facilities). All these cost must be included in the firm all-inclusive hourly rates.
- (c) **Variation in Professional Services Resource Rates:** For any given resource category, where the financial tables provided by Canada allow different firm rates to be charged for a resource category during different time periods:
 - i. the rate bid must not increase by more than 5% from one time period to the next, and
 - ii. the rate bid for the same resource category during any subsequent time period must not be lower than the rate bid for the time period that includes the first month of the Initial Contract Period.
- (d) **All Costs to be Included:** The financial bid must include all costs for the requirement described in the bid solicitation for the entire Contract Period, including any option years. The identification of all necessary equipment, software, peripherals, cabling and components required to meet the requirements of the bid solicitation and the associated costs of these items is the sole responsibility of the Bidder.
- (e) **Blank Prices:** Bidders are requested to insert "\$0.00" for any item for which it does not intend to charge or for items that are already included in other prices set out in the tables. If the Bidder leaves any price blank, Canada will treat the price as "\$0.00" for evaluation purposes and may request that the Bidder confirm that the price is, in fact, \$0.00. No bidder will be permitted to add or change a price as part of this confirmation. Any bidder who does not confirm that the price for a blank item is \$0.00 will be declared non-responsive.

1.2.1 SACC Manual Clauses

C3011T (2010-01-11), Exchange Rate Fluctuation

1.3 Section III : Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.
- (c) In addition to any other time periods established in the bid solicitation:
 - (i) **Requests for Clarification:** If Canada seeks clarification or verification from the Bidder about its bid, the Bidder will have 2 working days (or a longer period if specified in writing by the Contracting Authority) to provide the necessary information to Canada. Failure to meet this deadline will result in the bid being declared non-responsive.
 - (ii) **Extension of Time:** If additional time is required by the Bidder, the Contracting Authority may grant an extension in his or her sole discretion.

1.1 Technical Evaluation

Except where expressly provided otherwise, the experience described in the bid must be the experience of the Bidder itself (which includes the experience of any companies that formed the Bidder by way of a merger but does not include any experience acquired through a purchase of assets or an assignment of contract). The experience of the Bidder's affiliates (i.e. parent, subsidiary or sister corporations), subcontractors, or suppliers will not be considered.

1.1.1 Mandatory Technical Criteria

(a) Each bid will be reviewed for compliance with the mandatory requirements of the bid solicitation. All elements of the bid solicitation that are mandatory requirements are identified specifically with the words "must" or "mandatory". Bids that do not comply with each and every mandatory requirement will be considered non-responsive and be disqualified.

(b) The mandatory requirements are described in :

Attachment 2, Mandatory and Point Rated Technical Criteria.

1.1.2 Point Rated Technical Criteria

(a) Each bid will be rated by assigning a score to the rated requirements, which are identified in the bid solicitation by the word "rated" or by reference to a score. Bidders who fail to submit complete bids with all the information requested by this bid solicitation will be rated accordingly.

(b) The rated requirements are described in :

Attachment 2, Mandatory and Point Rated Technical Criteria.

1.1.3 Customer Reference Checks:

- (i) For reference checks, Canada will conduct the reference check in writing by email. Canada will send all email reference check requests to contacts supplied by all the Bidders on the same day using the email address provided in the bid. Canada will not award any points unless the response is received within 5 working days of the date that Canada's email was sent.
- (ii) On the third working day after sending out the reference check request, if Canada has not received a response, Canada will notify the Bidder by email, to allow the Bidder to contact its reference directly to ensure that it responds to Canada within 5 working days. If the individual named by a Bidder is unavailable when required during the evaluation period, the Bidder may provide the name and email address of an alternate contact person from the same customer. Bidders will only be provided with this opportunity once for each customer, and only if the originally named individual is unavailable to respond (i.e., the Bidder will not be provided with an opportunity to submit the name of an alternate contact person if the original contact person indicates that he or she is unwilling or unable to respond). *The Bidder will have 24 hours to submit the name of a new contact. That contact will again be given 5 working days to respond once Canada sends its reference check request.*
- (iii) Wherever information provided by a reference differs from the information supplied by the Bidder, the information supplied by the reference will be the information evaluated.
- (iv) Points will not be allocated and/or a bidder will not meet the mandatory experience requirement (as applicable) if the reference customer is not a customer of the Bidder itself (for example, the customer cannot be the customer of an affiliate of the Bidder instead of being a customer of the Bidder itself). Nor will points be allocated if the customer is itself an affiliate or other entity that does not deal at arm's length with the Bidder.
- (v) Whether or not to conduct reference checks is discretionary. However, if PWGSC chooses to conduct reference checks for any given rated or mandatory requirement, it will check the references for that requirement for all bidders to be recommended for contract award.

1.2 Financial Evaluation

1.2.1 Mandatory Financial Criteria

Bidders must submit their financial bid in accordance with **Annex B, Basis of Payment**.

1.2.2 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, the Goods and Services Tax or the Harmonized Sales Tax excluded, FOB destination, Canadian customs duties and excise taxes included.

The financial evaluation will be conducted by calculating the Total Bid Price using Annex B, Basis of Payment, completed by the bidders.

The financial evaluation process is described in Attachment 1, Evaluation of Price.

1.2.3 Substantiation of Professional Services Rates

In Canada's experience, bidders will from time to time propose rates at the time of bidding for one or more categories of resources that they later refuse to honour, on the basis that these rates do not allow them to recover their own costs and/or make a profit. When evaluating the rates bid for professional services, Canada may, but will have no obligation to, require price support in accordance with this Article. If Canada requests price support, it will be requested from all otherwise responsive bidders who have proposed a rate that is at least 20% lower than the median rate bid by all responsive bidders for the relevant resource category or categories. If Canada requests price support, the following information is required:

- (i) an invoice (referencing a contract serial number or other unique contract identifier) that shows that the Bidder has provided and invoiced a customer (with whom the Bidder deals at arm's length) for services performed for that customer similar to the services that would be provided in the relevant resource category, where those services were provided for at least three months within the twelve months before the bid solicitation closing date, and the fees charged were equal to or less than the rate offered to Canada;
- (ii) in relation to the invoice in (i), evidence from the bidder's customer that the services identified in the invoice include at least 50% of the tasks listed in the Statement of Work for the category of resource being assessed for an unreasonably low rate. This evidence must consist of either a copy of the contract (which must describe the services to be provided and demonstrate that at least 50% of the tasks to be performed are the same as those to be performed under the Statement of Work in this bid solicitation) or the customer's signed certification that the services subject to the charges in the invoice included at least 50% of the same tasks to be performed under the Statement of Work in this bid solicitation);
- (iii) in respect of each contract for which an invoice is submitted as substantiation, a résumé for the resource that provided the services under that contract that demonstrates that, in relation to the resource category for which the rates are being substantiated, the resource would meet the mandatory requirements and achieve any required pass mark for any rated criteria; and
- (iv) the name, telephone number and, if available, email address of a contact person at the customer who received each invoice submitted under (i), so that Canada may verify any information provided by the Bidder.

Once Canada requests substantiation of the rates bid for any resource category, it is the sole responsibility of the Bidder to submit information (as described above and as otherwise may be requested by Canada, including information that would allow Canada to verify information with the resource proposed) that will allow Canada to determine whether it can rely, with confidence, on the Bidder's ability to provide the required services at the rates bid. If Canada determines that the information provided by the Bidder does not adequately substantiate the unreasonably low rates, the bid will be declared non-responsive.

2. Basis of Selection

2.1 Basis of Selection - Lowest Evaluated Price Per Point

1. To be declared responsive, a bid must:
 - (a) comply with all the requirements of the bid solicitation;
 - (b) meet all mandatory technical evaluation criteria;
 - (c) obtain the required minimum points for each criterion and each group of criteria with a pass mark; and
 - (d) obtain the required minimum of 60% percent overall of the points for the technical evaluation criteria which are subject to point rating.
2. Bids not meeting (a) or (b) or (c) or (d) will be declared non-responsive. Neither the responsive bid that receives the highest number of points nor the one that proposed the lowest price will necessarily be accepted. The responsive bid with the lowest evaluated price per point will be recommended for award of a contract.
3. Bidders should note that all contract awards are subject to Canada's internal approvals process, which includes a requirement to approve funding in the amount of any proposed contract. Despite the fact that the Bidder may have been recommended for contract award, a contract will only be awarded if internal approval is granted according to Canada's internal policies. If approval is not granted, no contract will be awarded.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications to be awarded a contract. Canada will declare a bid non-responsive if the required certifications are not completed and submitted in accordance with the articles below.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify the bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies as per section 01 of Standard Instructions 2003, for himself and his affiliates, to be in compliance with the Code of Conduct and Certifications clause of the Standard instructions. The related documentation therein required will help Canada in confirming that the certifications are true.

2. Certifications Precedent to Contract Award

The certifications listed below should be completed and submitted with the bid but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

2.1 Federal Contractors Program for Employment Equity - Certification

2.1.1 Federal Contractors Program - \$200,000 or more

1. The Federal Contractors Program for Employment Equity (FCP) requires that some suppliers, including a supplier who is a member of a joint venture, bidding for federal government contracts, valued at \$200,000 or more (including all applicable taxes), make a formal commitment to implement employment equity. This is a condition precedent to contract award. If the Bidder, or, if the Bidder is a joint venture and if any member of the joint venture, is subject to the FCP, evidence of its commitment must be provided before the award of the Contract.

Suppliers who have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive government contracts over the threshold for solicitation of bids as set out in the *Government Contracts Regulations*. Suppliers may be declared ineligible contractors either as a result of a finding of non-compliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible

contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

2. If the Bidder does not fall within the exceptions enumerated in 3.(a) or (b) below, or does not have a valid certificate number confirming its adherence to the FCP, the Bidder must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity, to the Labour Branch of HRSDC.
3. The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- (a) ☐ is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;
- (b) ☐ is not subject to the FCP, being a regulated employer under the *Employment Equity Act*, S.C. 1995, c. 44;
- (c) ☐ is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC (having not bid on requirements of \$200,000 or more), in which case a duly signed certificate of commitment is attached;
- (d) ☐ is subject to the FCP, and has a valid certificate number as follows: _____ (e.g. has not been declared an ineligible contractor by HRSDC.)

Further information on the FCP is available on the HRSDC Web site (<http://www.hrsdc.gc.ca/eng/labour/equality/fcp/index.shtml>).

2.2 Former Public Servant Certification

Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

Definitions

For the purposes of this clause,

"former public servant" is any former member of a department as defined in the *Financial Administration Act*, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police and includes:

- (a) an individual;

- (b) an individual who has incorporated;
- (c) a partnership made of former public servants; or
- (d) a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, in the context of the fee abatement formula, a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c. C-17, the *Defence Services Pension Continuation Act*, 1970, c. D-3, the *Royal Canadian Mounted Police Pension Continuation Act*, 1970, c. R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c. R-11, the *Members of Parliament Retiring Allowances Act*, R.S., 1985, c. M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c. C-8.

Former Public Servant in Receipt of a Pension

Is the Bidder a FPS in receipt of a pension as defined above?

YES () NO ()

If so, the Bidder must provide the following information:

- (a) name of former public servant;
- (b) date of termination of employment or retirement from the Public Service.

Work Force Reduction Program

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program?

YES () NO ()

If so, the Bidder must provide the following information:

- (a) name of former public servant;
- (b) conditions of the lump sum payment incentive;
- (c) date of termination of employment;
- (d) amount of lump sum payment;
- (e) rate of pay on which lump sum payment is based;
- (f) period of lump sum payment including start date, end date and number of weeks;
- (g) number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

2.3 Canadian Content Certification

This procurement is limited to Canadian services.

The Bidder certifies that:

- () the service(s) offered is(are) a Canadian service as defined in paragraph 2 of clause A3050T.

2.3.1 SACC Manual clause A3050T (2010-01-11), Canadian Content Definition

2.4 Status and Availability of Resources

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, by submitting a bid, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

2.5 Education and Experience

The Bidder certifies that all the information provided in the résumés and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.

2.6 Language Capability

The Bidder certifies that it has the language capability required to perform the Work, as stipulated in the Statement of Work.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement

1. Before award of a contract, the following conditions must be met:
 - (a) the Bidder must hold a valid organization security clearance as indicated in Part 7 - Resulting Contract Clauses;
 - (b) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work site(s) must meet the security requirement as indicated in Part 7 - Resulting Contract Clauses;
 - (c) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites.
 - (d) the Bidder's proposed location of work performance or document safeguarding must meet the security requirement as indicated in Part 7 - Resulting Contract Clauses;
 - (e) the Bidder must provide the address(es) of proposed location(s) of work performance or document safeguarding.
2. Bidders are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful bidder to obtain the required clearance will be at the entire discretion of the Contracting Authority.
3. For additional information on security requirements, bidders should consult the "Security Requirements for PWGSC Bid Solicitations - Instructions for Bidders" (<http://www.tpsgc-pwgsc.gc.ca/app-acq/lc-pl/lc-pl-eng.html#a31>) document on the Departmental Standard Procurement Documents Web site.
4. In the case of a joint venture bidder, each member of the joint venture must meet the security requirements.

2. Financial Capability

- (a) SACC Manual clause A9033T (2011-05-16), Financial Capability
- (b) In the case of a joint venture bidder, each member of the joint venture must meet the financial capability requirements.

3. Controlled Goods Requirement

- (a) SACC Manual clause A9130T (2011-05-16), Controlled Goods Program
- (b) In the case of a joint venture bidder, each member of the joint venture must meet the financial capability requirements.

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

1. Requirement

- (a) _____ (the "**Contractor**") agrees to supply to the Client the services described in the Contract, including the Statement of Work and the Contractor's technical bid entitled _____ *(to be completed at Contract award)*, dated _____ *(to be completed at Contract award)*, in accordance with, and at the prices set out in, the Contract. This includes:
- (i) providing professional services, as and when requested by Canada.
- (b) **Client:** Under the Contract, the "**Client**" is the Department of National Defense.
- (c) **Reorganization of Client:** The Contractor's obligation to perform the Work will not be affected by (and no additional fees will be payable as a result of) the renaming, reorganization, reconfiguration, or restructuring of any Client. The reorganization, reconfiguration and restructuring of the Client includes the privatization of the Client, its merger with another entity, or its dissolution, where that dissolution is followed by the creation of another entity or entities with mandates similar to the original Client.
- (d) **Defined Terms:** Words and expressions defined in the General Conditions or Supplemental General Conditions and used in the Contract have the meanings given to them in the General Conditions or Supplemental General Conditions.

1.1 Task Authorization

1.1.1 Task Authorization - Department of National Defence

The administration of the Task Authorization process will be carried out by **The Procurement and Payment group at Defence Research and Development Canada - Valcartier, represented by the DND Procurement Authority**. This process includes monitoring, controlling and reporting on expenditures of the contract with task authorizations to the Contracting Authority.

1.1.2 Task Authorization Process

Task Authorization:

The Work to be performed under the Contract will be on an "as and when requested basis" using a Task Authorization (TA). The Work described in the TA must be in accordance with the scope of the Contract.

Task Authorization Process:

- The DND Procurement Authority will provide the Contractor with a description of the task using the DND 626, Task Authorization Form specified in Annex F.

2. The Task Authorization (TA) will contain the details of the activities to be performed, a description of the deliverables, and a schedule indicating completion dates for the major activities or submission dates for the deliverables. The TA will also include the applicable basis(bases) and methods of payment as specified in the Contract.
3. The Contractor must provide the DND Procurement Authority, **within five (5) calendar days** of its receipt, the proposed total estimated cost for performing the task and a breakdown of that cost, established in accordance with the Basis of Payment specified in the Contract.
4. The Contractor must not commence work until a TA authorized by the DND Procurement Authority has been received by the Contractor. The Contractor acknowledges that any work performed before a TA has been received will be done at the Contractor's own risk.

1.1.3 Task Authorization Limit

The DND Procurement Authority may authorize individual task authorizations up to a limit of **\$250,000.00**, Goods and Services Tax or Harmonized Sales Tax included, inclusive of any revisions. **The total amount for the purchase of goods (including hardware, materials, equipment, etc.) for each individual task authorization authorized by DND Procurement Authority cannot exceed \$20,000.00**, Goods and Services Tax or Harmonized Sales Tax included, inclusive of any revisions.

Any TA to be issued with a value in excess of these limits must be authorized by the Contracting Authority before issuance.

1.2 Disclosure Certification

On completion of the Work, the Contractor must submit to the Technical Authority and to the Contracting Authority a copy of the Contractor Disclosure of Foreground Information attached as Annex C stating that all applicable disclosures were submitted.

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2040 (2012-11-19), General Conditions - Research & Development, apply to and form part of the Contract.

2.2 Supplemental General Conditions

The following supplemental general conditions apply to and form part of the Contract:

4002 (2010-08-16), Software Development or Modification Services

2.3 SACC Manual Clauses

K3410C (2008-12-12), Canada to Own Intellectual Property Rights in Foreground Information

K3305C (2008-05-12), License to Intellectual Property Rights in Foreground Information

2.4 Non-disclosure Agreement

The Contractor must obtain from each proposed resource the completed and signed non-disclosure agreement, attached at Annex D, and provide it to the Technical Authority before they are given access to information by or on behalf of Canada in connection with the Work.

3. Security Requirement

SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:
PWGSC FILE # W7701-125076

1. The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, hold a valid Facility Security Clearance at the level of NATO SECRET, with approved Document safeguarding at the level of NATO SECRET, issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).
2. The Contractor/Offeror personnel requiring access to PROTECTED/CLASSIFIED information, assets or sensitive work site(s) must EACH hold a valid personnel security screening at the level of NATO SECRET, granted or approved by the CISD, PWGSC.
3. The Contractor/Offeror personnel requiring access to FOREIGN information, assets or sensitive work site(s) must EACH hold a valid personnel security screening at the level of NATO SECRET, granted or approved by the CISD, PWGSC.
4. The Contractor/Offeror personnel requiring access to NATO UNCLASSIFIED information or assets do not require to hold a personnel security clearance; however, the Contractor must ensure that the NATO Unclassified information is not releasable to third parties and that the "need to know" principle is applied to personnel accessing this information
5. The Contractor/Offeror personnel requiring access to NATO information, assets or sensitive work site(s) must be permanent residents of Canada or citizens of a NATO member country and EACH hold a valid personnel security screening at the level of NATO SECRET, granted or approved by the appropriate delegated Nato Security Authority.
6. The Processing of PROTECTED/CLASSIFIED information electronically at the Contractor/Offeror's site is NOT permitted under this Contract/Standing Offer.
7. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of CISD/PWGSC.
8. The Contractor/Offeror must comply with the provisions of the:
 - (a) Security Requirements Check List and security guide (if applicable), attached at Annex E;
 - (b) Industrial Security Manual (Latest Edition).

NOTE :

Until the security screening of the Contractor/Offeror personnel required by this Contract/Standing Offer has been completed satisfactorily by the Canadian Industrial Security Directorate, Public Works and Government Services Canada, the Contractor/Offeror personnel MAY NOT HAVE ACCESS to CLASSIFIED/PROTECTED information or assets, and MAY NOT ENTER sites where such information or assets are kept, without an escort.

4. Term of Contract**4.1 Contract Period**

The Contract Period is the entire period of time during which the Contractor is obliged to do the Work, which begins on the date the Contract is awarded and ends on March 31st, 2018.

5. Authorities**5.1 Contracting Authority**

The Contracting Authority for the Contract is:

Gabriel Piras
Public Works and Government Services Canada
601-1550 D'Estimauville
Québec, QC.
G1J 0C7

Telephone: 418-649-2870
Facsimile: 418-649-2209
E-mail address: Gabriel.Piras@tpsgc.pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

5.2 Technical Authority (to be completed at Contract award)

The Technical Authority for the Contract is:

Name :
Organization:
Telephone:
Facsimile:
E-mail address:

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical

Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.3 Contractor's Representative (to be completed at Contract award)

Administrative representative :

Name :
Telephone :
Facsimile :
Email :

Technical representative :

Name :
Telephone :
Facsimile :
Email :

5.4 DND Procurement Authority (to be completed at Contract award)

The DND Procurement Authority for the Contract is:

Name :
Organization :
Telephone:
Facsimile:
E-mail address:

The DND Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The DND Procurement Authority is responsible for the implementation of tools and processes required for the administration of the Task Authorizations. The Contractor may discuss administrative matters identified in Task Authorizations with the DND Procurement Authority however the DND Procurement Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

6. Payment

6.1 Basis of Payment

(i) Professional Services provided under a Task Authorization subject to a Firm Price:

In consideration of the Contractor satisfactorily completing all of its obligations under the authorized Task Authorization (TA), the Contractor will be paid a firm price in accordance with the basis of payment, in Annex B, as specified in the authorized TA. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been authorized, in writing, by the Contracting Authority before their incorporation into the Work.

(ii) Professional Services provided under a Task Authorization subject to a Ceiling Price :

The Contractor will be reimbursed its costs reasonably and properly incurred in the performance of the Work, plus a profit, as determined in accordance with the Basis of Payment in Annex B, to the ceiling price specified in the approved TA. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

The ceiling price is subject to downward adjustment so as not to exceed the actual costs reasonably incurred in the performance of the Work and computed in accordance with the Basis of Payment.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority, before their incorporation into the Work.

(iii) Professional Services provided under a Task Authorization subject to a Limitation of Expenditure :

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work specified in the authorized Task Authorization (TA), as determined in accordance with the Basis of Payment in Annex B, to the limitation of expenditure specified in the authorized TA.

Canada's liability to the Contractor under the authorized TA must not exceed the limitation of expenditure specified in the authorized TA. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

No increase in the liability of Canada or in the price of the Work specified in the authorized TA resulting from any design changes, modifications or interpretations of the Work will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been authorized, in writing, by the Contracting Authority before their incorporation into the Work.

(iv) Travel and Living Expenses :

There will be no travel time or travel and living expenses payable for services rendered within 50 kilometres from Defence Research and Development Canada - Valcartier, located at 2459 Pie-XI Blvd North, Quebec City, Quebec.

For services rendered further than 50 kilometres from Defence Research and Development Canada - Valcartier, the Contractor will be paid its actual travel time in accordance with the hourly rates detailed in Annex B, Basis of Payment.

The Contractor will be reimbursed for the authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for overhead or profit, in accordance with the meal, private vehicle and incidental expense allowances specified in Appendices B, C and D of the Travel Directive, and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Technical Authority.

- (v) **Competitive Award** : The Contractor acknowledges that the Contract has been awarded as a result of a competitive process. No additional charges will be allowed to compensate for errors, oversights, misconceptions or underestimates made by the Contractor when bidding for the Contract.
- (vi) **Professional Services Rates** : In Canada's experience, bidders from time to time propose rates at the time of bidding for one or more categories of resources that they later refuse to honour, on the basis that these rates do not allow them to recover their own costs and/or make a profit. This denies Canada of the benefit of the awarded contract. If the Contractor does not respond or refuses to provide an individual with the qualifications described in the Contract within the time described in the Contract (or proposes instead to provide someone from an alternate category at a different rate), whether or not Canada terminates the Contract as a whole or in part, Canada may impose sanctions or take other measures in accordance with the PWGSC Vendor Performance Corrective Measure Policy (or equivalent) then in effect, which measures may include an assessment that results in conditions applied against the Contractor to be fulfilled before doing further business with Canada, or full debarment of the Contractor from bidding on future requirements.
- (vii) **Purpose of Estimates** : All estimated costs contained in the Contract are included solely for the administrative purposes of Canada and do not represent a commitment on the part of Canada to purchase goods or services in these amounts. Any commitment to purchase specific amounts or values of goods or services is described elsewhere in the Contract.

6.2 Minimum Work Guarantee - All the Work - Task Authorizations

1. In this clause,

"Maximum Contract Value" means the amount specified in the "Limitation of Expenditure" clause set out in the Contract; and

"Minimum Contract Value" means 10%.

2. Canada's obligation under the Contract is to request Work in the amount of the Minimum Contract Value or, at Canada's option, to pay the Contractor at the end of the Contract in accordance with paragraph 3. In consideration of such obligation, the Contractor agrees to stand in readiness throughout the Contract period to perform the Work described in the Contract. Canada's maximum liability for work performed under the Contract must not exceed the Maximum Contract Value, unless an increase is authorized in writing by the Contracting Authority.
3. In the event that Canada does not request work in the amount of the Minimum Contract Value during the period of the Contract, Canada must pay the Contractor the difference between the Minimum Contract Value and the total cost of the Work requested.
4. Canada will have no obligation to the Contractor under this clause if Canada terminates the Contract in whole or in part for default.

6.3 Limitation of Expenditure - Cumulative Total of all Task Authorizations

1. Canada's total liability to the Contractor under the Contract for all authorized Task Authorizations (TAs), inclusive of any revisions, must not exceed the sum of **\$17,350,000.00**. Customs duties are included and the Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work.
3. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority.
4. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:
 - (a) when it is 75 percent committed, or
 - (b) four (4) months before the contract expiry date, or
 - (c) as soon as the Contractor considers that the sum is inadequate for the completion of the Work required in all authorized TAs, inclusive of any revisions,

whichever comes first.
5. If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority, a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

6.4 Method of Payment

6.4.1 Payments will be made not more frequently than once a month.

6.4.2 Depending on the method of payment specified in the applicable TA, one of the following methods of payment clauses will apply.

6.4.2.1 Single Payment (For a Firm Price TA, for a TA subject to a Limitation of Expenditure or a Ceiling Price)

Canada will pay the Contractor upon completion and delivery of the Work associated with the Task Authorization in accordance with the payment provisions of the Contract if:

- (a) an accurate and complete claim for payment using PWGSC-TPSGC 1111, Claim for Progress Payment, and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- (b) all such documents have been verified by Canada;
- (c) the Work delivered has been accepted by Canada.

6.4.2.2 Milestone Payments (For a Firm Price TA)

For any task authorization issued under the Contract that includes a schedule of milestone payments to be made once specific portions of the work have been completed and accepted, Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Task Authorization and the payment provisions of the Contract if:

- (a) an accurate and complete claim for milestone payment using PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- (b) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- (c) all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

6.4.2.3 Progress Payments (For a TA subject to a Limitation of Expenditure or a Ceiling Price)

- (a) Canada will make progress payments in accordance with the payment provisions of the Task Authorization and the Contract, no more than once a month, for costs incurred in the performance of the Work up to 90 percent of the amount claimed and approved by Canada if:
 - (i) an accurate and complete claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
 - (ii) the amount claimed is in accordance with the Basis of Payment and the Task Authorization;
 - (iii) the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Task Authorization.
 - (iv) all certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives.
- (b) The balance of the amount payable will be paid in accordance with the payment provisions of the Task Authorization and the Contract upon completion and delivery of all work required under the Task Authorization if the Work has been accepted by Canada and a final claim for the payment is submitted.
- (c) Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the right to make adjustments to the Contract from time to time during

the performance of the Work. Any overpayment resulting from progress payments or otherwise must be refunded promptly to Canada.

6.5 SACC Manual Clauses

A9117C (2007-11-30), T1204 - Direct Request by Customer Department
C0305C (2008-05-12), Cost Submission

6.6 Discretionary Audit

SACC Manual Clause C0705C (2010-01-11), Discretionary Audit

7. Invoicing Instructions

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111. Form PWGSC-TPSGC 1111 is available at the following Website_____ <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>

Each claim must show:

- (a) all information required on form PWGSC-TPSGC 1111;
 - (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
 - (c) the Task Authorization (TA) number;
 - (d) the description of the milestone invoiced, as applicable.
2. For TAs subject to a Limitation of Expenditure or a Ceiling Price, each invoice must be supported by:
 - (a) a list of all expenses, in accordance with the TA;
 - (b) a copy of time sheets to support the time claimed;
 - (c) a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses;
 - (d) a copy of the monthly progress report.
3. Goods and Services Tax (GST) or Harmonized Sales Tax (HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.
4. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Contracting Authority for certification.

ATTN: Mrs Suzanne Larrivée

Public Works and Government Services Canada
601-1550 D'Estimauville
Québec, QC.
G1J 0C7
Email: Suzanne.Larrivee@tpsgc-pwgsc.gc.ca

The Contracting Authority will then forward the original and two (2) copies of the claim to the Technical Authority for appropriate certification after inspection and acceptance of the Work takes place, and onward submission to the Payment Office for the remaining certification and payment.

5. The Contractor must not submit claims until all work identified in the claim is completed.

8. Certifications

Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the entire contract period. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

8.1 SACC Manual Clauses

A3060C (2008-05-12), Canadian Content Certification

9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____ **(to be inserted at contract award)**.

10. Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the supplemental general conditions 4002 (2010-08-16), Software Development or Modification Services;
- (c) the SACC Manual Clause K3410C (2008-12-12), Canada to Own Intellectual Property Rights in Foreground Information;
- (d) the general conditions 2040 (2012-11-19), General Conditions - Research & Development, apply to and form part of the Contract;
- (e) Annex A, Statement of Work;
- (f) Annex B, Basis of Payment;
- (g) Annex C, Contractor Disclosure of Foreground Information;
- (h) Annex D, Non-disclosure Agreement
- (i) Annex E, Security Requirements Check List
- (j) Annex F, DND 626, Task Authorization Form;
- (k) the signed Task Authorizations (including all of its annexes, if any);
- (l) the Contractor's bid dated _____ **(to be inserted at contract award)**.

11. Defence Contract

SACC Manual clause A9006C (2008-05-12), Defence Contract

12. Foreign Nationals (Canadian Contractor)

SACC Manual clause A2000C (2006-06-16), Foreign Nationals (Canadian Contractor)

13. Insurance

SACC Manual clause G1005C (2008-05-12), Insurance

14. Controlled Goods Program

14.1 SACC Manual clause A9131C (2011-05-16), Controlled Goods Program

14.2 ACC Manual clause B4060C (2011-05-16), Controlled Goods

15. Joint Venture Contractor

- (a) The Contractor confirms that the name of the joint venture is _____ and that it is comprised of the following members: _____.
- (b) With respect to the relationship among the members of the joint venture Contractor, each member agrees, represents and warrants (as applicable) that:
 - (i) _____ has been appointed as the "representative member" of the joint venture Contractor and has fully authority to act as agent for each member regarding all matters relating to the Contract;
 - (ii) by giving notice to the representative member, Canada will be considered to have given notice to all the members of the joint venture Contractor; and
 - (iii) all payments made by Canada to the representative member will act as a release by all the members.
- (c) All the members agree that Canada may terminate the Contract in its discretion if there is a dispute among the members that, in Canada's opinion, affects the performance of the Work in any way.
- (d) All the members are jointly and severally or solidarily liable for the performance of the entire Contract.
- (e) The Contractor acknowledges that any change in the membership of the joint venture (i.e., a change in the number of members or the substitution of another legal entity for an existing member) constitutes an assignment and is subject to the assignment provisions of the General Conditions.
- (f) The Contractor acknowledges that all security and controlled goods requirements in the Contract, if any, apply to each member of the joint venture Contractor.

Note to Bidders: This Article will be deleted if the bidder awarded the contract is not a joint venture. If the contractor is a joint venture, this clause will be completed with information provided in its bid.

16. Progress Reports

1. The Contractor must submit monthly reports, on the first business day of each month, in electronic format, on the progress of the Work, to both the Technical Authority and the Contracting Authority.
2. The progress report must contain two parts:

(a) PART 1 : The Contractor must answer the following three questions:

- (i) Is the project on schedule?
- (ii) Is the project within budget?
- (iii) Is the project free of any areas of concern in which the assistance or guidance of Canada may be required?

Each negative response must be supported with an explanation.

(b) PART 2 : A narrative report, brief, yet sufficiently detailed to enable both the Technical Authority and the Contracting Authority to evaluate the progress of the Work, containing as a minimum:

- (i) A description of the progress of each task and of the Work as a whole during the period of the report. Sufficient sketches, diagrams, photographs, etc., must be included, if necessary, to describe the progress accomplished.
- (ii) An explanation of any variation from the work plan.
- (iii) A description of trips or conferences connected with the Contract during the period of the report.
- (iv) A description of any major equipment purchased or constructed during the period of the report.

17. Site Regulations

The Contractor must comply with all standing orders or other regulations, instructions and directives in force on the site where the Work is performed.

18. Identification Badge

SACC Manual clause A9065C (2006-06-16), Identification Badge

19. Representations and Warranties

The Contractor made statements regarding its and its proposed resources' experience and expertise in its bid that resulted in the award of the Contract. The Contractor represents and warrants that all those

statements are true and acknowledges that Canada relied on those statements in awarding the Contract. The Contractor also represents and warrants that it has, and all its resources and subcontractors that perform the Work have, and at all times during the Contract Period they will have, the skills, qualifications, expertise and experience necessary to perform and manage the Work in accordance with the Contract, and that the Contractor (and any resources or subcontractors it uses) has previously performed similar services for other customers.

20. Access to Canada's Property and Facilities

Canada's property, facilities, equipment, documentation, and personnel are not automatically available to the Contractor. If the Contractor would like access to any of these, it is responsible for making a request to the Technical Authority. Unless expressly stated in the Contract, Canada has no obligation to provide any of these to the Contractor. If Canada chooses, in its discretion, to make its property, facilities, equipment, documentation or personnel available to the Contractor to perform the Work, Canada may require an adjustment to the Basis of Payment and additional security requirements may apply.

Solicitation No. - N° de l'invitation

W7701-125076/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

qcl018

Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

W7701-12-5076

QCL-1-34958

ANNEX A

STATEMENT OF WORK

The Statement of Work is to be inserted at this point and forms part of this document.

ANNEX B**BASIS OF PAYMENT****1. LABOUR :**

The Contractor agrees to provide the following resources as and when requested by Canada at the following firm all inclusive rates (in accordance with the Payment provisions of the Contract) :

Note : The categories of resources are divided according to the following three groups:

- Group 1 : Core Resources
- Group 2 : Regular Use
- Group 3 : Unpredictable use and/or ad hoc

Refer to section 2.4 - Resources - of Annex A - Statement of Work - for a description of each group.

Group 1 : Core Resources

Proposed Resources	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
System Engineering						
A.2 – Enterprise Architect, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
A.3 – Systems Architect, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
Management						
M.1 – Project Manager, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
Science & Technology						
S.1 – Sensemaking Specialist, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
S.4 – IKM Specialist, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0

Solicitation No. - N° de l'invitation

W7701-125076/A

Client Ref. No. - N° de réf. du client

W7701-12-5076

Amd. No. - N° de la modif.

File No. - N° du dossier

QCL-1-34958

Buyer ID - Id de l'acheteur

qcl018

CCC No./N° CCC - FMS No/ N° VME

Proposed Resources	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
S.7 – HCI and Visualisation Specialist, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
S.10 – Cognitive Specialist, Level 3 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0
Military Expertise						
E.1 – Intelligence SME, Level 2 1. _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	1.0

Group 2 : Regular Use

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
System Engineering						
A.1 – Software Architect, Level 1	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.1 – Software Architect, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.30
A.2 – Enterprise Architect, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.3 – Systems Architect, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.25
A.4 – Data Architect, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.5 – Software Analyst, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.6 – Business Analyst, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.7 – Data Modeling Analyst, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.12 – Geomatics Analyst, Level 3	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.10
A.13 – Software Lead Developer, Level 2	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.50
A.13 – Software Lead Developer, Level 3	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	0.25

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
A.14 – Geomatics Lead Developer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
A.15 – Software Programmer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	4.0
A.15 – Software Programmer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	4.0
A.17 – Tester Programmer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.40
A.18 – System Administration Programmer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
Management						
M.1 – Project Manager, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.33
M.2 – Project Assistant , Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.5 – Quality Assurance Specialist/Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.6 – Technical Writer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.7 – Group Facilitator, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
Science & Technology						
S.2 – Sensemaking Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.2 – Sensemaking Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.3 – Sensemaking Lead Developer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.5 – IKM Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
S.6 – IKM Lead Developer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
S.9 – HCI and Visualisation Lead Developer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	1.50
S.9 – HCI and Visualisation Lead Developer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.11 – Operations Research Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.12 – Operations Research Lead Developer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
Military Expertise						
E.2 – C2 SME, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.25

Group 3: Unpredictable use and/or ad hoc

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
System Engineering						
A.1 - Software Architect, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
A.4 - Data Architect, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
A.5 - Software Analyst, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.5 - Software Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.6- Business Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
A.7- Data Modeling Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
A.8 - Data Administration Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.8 - Data Administration Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.9 - Security Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.9 - Security Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.10 - Network Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.10 - Network Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.11 - Test Coordinator Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.11 - Test Coordinator Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.12 - Geomatics Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
A.13 - Software Lead Developer, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.25

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
A.14 - Geomatics Lead Developer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
A.16 - Database Programmer, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.16 - Database Programmer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.16 - Database Programmer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.17 - Tester Programmer, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.40
A.18 - System Administration Programmer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
A.19 - Scenario Developer Specialist, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.19 - Scenario Developer Specialist, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.20 - Training Developer Specialist, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
A.20 - Training Developer Specialist, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
Management						
M.2 - Project Assistant , Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.2 - Project Assistant , Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.3 - Project Administrator, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.3 - Project Administrator, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.3 - Project Administrator, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.4 - Project Leader, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.4 - Project Leader, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.10
M.4 - Project Leader, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.5 - Quality Assurance Specialist/Analyst, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.5 - Quality Assurance Specialist/Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05

Resource Category	Firm Hourly Rate					
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	Est. Level of Effort
M.6 - Technical Writer, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.6 - Technical Writer, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.7 - Group Facilitator, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
M.7 - Group Facilitator, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.05
Science & Technology						
S.3 – Sensemaking Lead Developer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	1.50
S.5 - IKM Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.6 - IKM Lead Developer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
S.8 - HCI and Visualisation Analyst, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.8 - HCI and Visualisation Analyst, Level 3	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
S.11 - Operations Research Analyst, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.50
S.12 - Operations Research Lead Developer, Level 2	\$_____	\$_____	\$_____	\$_____	\$_____	0.25
Military Expertise						
E.1 - Intelligence SME, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.15
E.2 - C2 SME, Level 1	\$_____	\$_____	\$_____	\$_____	\$_____	0.05

2. **EQUIPMENT:** at laid down cost without markup
3. **RENTALS:** at actual cost without markup
4. **MATERIALS AND SUPPLIES:** at laid down cost without markup
5. **TRAVEL AND LIVING EXPENSES:** in accordance with Section 6.1(iv) of the Contract.
6. **SUBCONTRACTS (EXCEPT RESOURCES PROPOSED IN SECTION 1 - LABOUR) :** at actual cost without markup
7. **OTHER DIRECT CHARGES:** at actual cost without markup

Solicitation No. - N° de l'invitation

W7701-125076/A

Amd. No. - N° de la modif.

File No. - N° du dossier

QCL-1-34958

Buyer ID - Id de l'acheteur

qcl018

Client Ref. No. - N° de réf. du client

W7701-12-5076

CCC No./N° CCC - FMS No/ N° VME

Estimated Cost to a Limitation of Expenditure :

\$17,350,000.00
(GST/HST extra)

ANNEX C

CONTRACTOR DISCLOSURE OF FOREGROUND INFORMATION

Please refer to **Article 1 - Interpretation of 2040 General Conditions** for the definition of Foreground Information to to determine what information must be disclosed.
<http://sacc.pwgsc.gc.ca/sacc/query-e.jsp>.

The Contractor must provide the following information::

1. Contract No.:
2. What is the descriptive title of the FIP (Foreground Intellectual Property)?
3. Abbreviated description of the FIP and, if applicable, of the different systems and sub-systems.
4. What is or was the objective of the project?
5. Explain how the FIP meets the objective of the project (for example: the advantage of the new solution, what problem did the FIP resolve or what benefits did the FIP deliver).
6. Under which category (ies) would you best describe the FIP and why: Patents, Inventions, Trade Secrets, Copyright, Industrial Designs, Rights in Integrated Circuit Topography, Know-how, Other?
7. Describe the features or aspects of the FIP that are novel, useful and not obvious.
8. Has the FIP been tested or demonstrated? If yes, please summarise the results.
9. Has any publication or disclosure to others been made? If so, to whom, when, where and how?
10. Provide names and addresses of the inventors.
11. Provide an explicit and detailed description of the FIP developed during the contract (Refer to pertinent section of the technical report, if necessary).

Please specify name and position of person approving / authorizing this disclosure. This person is to sign and date the disclosure.

Signature

Date

Name

Title

(Internal DRDC Valcartier)

Signature

Date

Name

Title (Technical authority)

ANNEX D**NON-DISCLOSURE AGREEMENT**

I, _____, recognize that in the course of my work as an employee or subcontractor of _____, I may be given access to information by or on behalf of Canada in connection with the Work, pursuant to Contract Serial No W7701-125076/001/QCL between Her Majesty the Queen in right of Canada, represented by the Minister of Public Works and Government Services and _____, including any information that is confidential or proprietary to third parties, and information conceived, developed or produced by the Contractor as part of the Work. For the purposes of this agreement, information includes but not limited to: any documents, instructions, guidelines, data, material, advice or any other information whether received orally, in printed form, recorded electronically, or otherwise and whether or not labeled as proprietary or sensitive, that is disclosed to a person or that a person becomes aware of during the performance of the Contract.

I agree that I will not reproduce, copy, use, divulge, release or disclose, in whole or in part, in whatever way or form any information described above to any person other than a person employed by Canada on a need to know basis. I undertake to safeguard the same and take all necessary and appropriate measures, including those set out in any written or oral instructions issued by Canada, to prevent the disclosure of or access to such information in contravention of this agreement.

I also acknowledge that any information provided to the Contractor by or on behalf of Canada must be used solely for the purpose of the Contract and must remain the property of Canada or a third party, as the case may be.

I agree that the obligation of this agreement will survive the completion of the Contract Serial No W7701-125076/001/QCL.

Signature

Date

Solicitation No. - N° de l'invitation

W7701-125076/A

Amd. No. - N° de la modif.

File No. - N° du dossier

QCL-1-34958

Buyer ID - Id de l'acheteur

qcl018

Client Ref. No. - N° de réf. du client

W7701-12-5076

CCC No./N° CCC - FMS No/ N° VME

ANNEX E

SECURITY REQUIREMENTS CHECK LIST

The Security Requirements Check List (SRCL), which is enclosed, is to be inserted at this point and forms part of this document

Solicitation No. - N° de l'invitation

W7701-125076/A

Amd. No. - N° de la modif.

File No. - N° du dossier

QCL-1-34958

Buyer ID - Id de l'acheteur

qcl018

Client Ref. No. - N° de réf. du client

W7701-12-5076

CCC No./N° CCC - FMS No/ N° VME

ANNEX F

DND 626, TASK AUTHORIZATION FORM

The DND 626, *Task Authorization Form*, which is enclosed, is to be inserted at this point and forms part of this document

ATTACHMENT 1

EVALUATION OF PRICE

For evaluation purposes only, the Total Bid Price will be determined as follows :

1 - Financial Bid

Bidders must submit their financial bid in accordance with **Annex B, Basis of Payment**.

2 - Calculation of bid price

The Total Bid Price will be evaluated on the basis of the estimated level of effort specified in Annexe B - Basis of Payment. The Total Bid Price will be calculated as set out below.

3 - Cost of Labour :

The Cost of Labour for a given category (for a given bid) is the estimated level of effort multiplied by the average hourly rate provided for the given category (for a given bid) multiplied by 1650 hours.

$$\begin{array}{rcl}
 & & \text{[estimated level of effort for the given category]} \\
 X & & \text{[hourly rate bid for the given category]} \\
 X & & \text{[1650 hours]} \\
 \hline
 & & \text{[Cost of Labour for a given category]}
 \end{array}$$

Lastly, the Total Bid Price is then calculated by adding the Cost of Labour for all of the resource categories for a given bid.

For example:

- Estimated level of effort for "A.2 – Enterprise Architect, Level 3" = 1.0
- Let us assume that the average hourly rate for bid A = \$60, that for bid B = \$80 and that for bid C = \$150.

Therefore,

- Cost of labour for "A.2 – Enterprise Architect, Level 3", bid a
= 1.0 x \$60 x 1650 hours = \$99,000.
- Cost of labour for "A.2 – Enterprise Architect, Level 3", bid b
= 1.0 x \$80 x 1650 hours = \$132,000.
- Cost of labour for "A.2 – Enterprise Architect, Level 3", bid c
= 1.0 x \$150 x 1650 hours = \$247,500.

4 - Sample calculations for the price of the three bids

The following table provides examples of calculations for the price of the three bids.

Table 4.1 - Sample calculations for the three bids

Resource category	Est. Level of Effort	Rate A	Price for A	Rate B	Price for B	Rate C	Price for C
A.2 – Enterprise Architect, Level 3	1.0	\$60.00	\$99,000.00	\$80.00	\$132,000.00	\$150.00	\$247,500.00
A.3 – Systems Architect, Level 3	1.0	\$70.00	\$115,500.00	\$90.00	\$148,500.00	\$140.00	\$231,000.00
M.1 – Project Manager, Level 3	1.0	\$80.00	\$132,000.00	\$80.00	\$132,000.00	\$130.00	\$214,500.00
S.1 – Sensemaking Specialist, Level 3	1.0	\$90.00	\$148,500.00	\$90.00	\$148,500.00	\$120.00	\$198,000.00
S.4 – IKM Specialist, Level 3	1.0	\$80.00	\$132,000.00	\$80.00	\$132,000.00	\$110.00	\$181,500.00
S.7 – HCI and Visualisation Specialist, Level 3	1.0	\$70.00	\$115,500.00	\$90.00	\$148,500.00	\$100.00	\$165,000.00
S.10 – Cognitive Specialist, Level 3	1.0	\$60.00	\$99,000.00	\$80.00	\$132,000.00	\$110.00	\$181,500.00
E.1 – Intelligence SME, Level 2	1.0	\$70.00	\$115,500.00	\$90.00	\$148,500.00	\$120.00	\$198,000.00
A.1 – Software Architect, Level 1	0.1	\$80.00	\$13,200.00	\$80.00	\$13,200.00	\$130.00	\$21,450.00
A.1 – Software Architect, Level 2	0.3	\$90.00	\$44,550.00	\$90.00	\$44,550.00	\$140.00	\$69,300.00
A.2 – Enterprise Architect, Level 2	0.1	\$80.00	\$13,200.00	\$80.00	\$13,200.00	\$150.00	\$24,750.00
A.3 – Systems Architect, Level 2	0.25	\$70.00	\$28,875.00	\$90.00	\$37,125.00	\$140.00	\$57,750.00
[...]							
TOTAL :			\$3,999,270.00		\$4,478,760.00		\$6,836,445.00

The “Est. Level of Effort” listed in the table are provided solely for the purpose of determining the estimated price for each bid. They represent approximate needs, provided in good faith, and should not be considered as a contractual guarantee.

These rates are provided as an example only and must not be interpreted as an indicator of the experience of the labour categories.

ATTACHMENT 2

MANDATORY AND POINT RATED TECHNICAL CRITERIA

Table of Contents

1. MANDATORY TECHNICAL CRITERIA	1
2. POINT RATED TECHNICAL CRITERIA	2
3. SUMMARY OF EXPERIENCE AND EXPERTISE TEMPLATE	26
4. PROJECT DESCRIPTION TEMPLATE	28

List of Tables

TABLE 1 – CORE TEAM RESOURCES	1
TABLE 2 – POINT RATED TECHNICAL CRITERIA	2
TABLE 3 - SUMMARY OF EXPERTISE AND EXPERIENCE TEMPLATE	27
TABLE 4 - PROJECT DESCRIPTION TEMPLATE	29

1. MANDATORY TECHNICAL CRITERIA

At bid closing time, the Bidder must comply with the following mandatory technical criteria and provide the necessary documentation to support compliance. Any bid which fails to meet the following mandatory technical criteria will be declared non-responsive. Each criterion should be addressed separately.

- 1.1 The Bidder must provide the name and a Curriculum Vitae (CV) for each of the resources identified in Table 1.
- 1.2 The Bidder must complete the template at Table 3 for each of the resources identified in Table 1.
- 1.3 The Bidder must propose resources who meet the matching experience and expertise as described in Annex A – Statement of Work, Appendix 2 – Category of Resources.
- 1.4 The same resource cannot be proposed for more than one category of resource.

Table 1 – Core Team Resources

Management and System Development Resources	
M.1 - Project Manager, Level 3	A.3 - Systems Architect, Level 3
A.2 - Enterprise Architect, Level 3	
Science & Technology and Military Expertise Resources	
S.1 - Sensemaking Specialist, Level 3	S.7 - HCI and Visualisation Specialist, Level 3
S.4 - Information/Knowledge Management (IKM) Specialist, Level 3	S.10 - Cognitive Specialist, Level 3
E.1 - Intelligence Subject Matter Expert, Level 2	

2. POINT RATED TECHNICAL CRITERIA

In the following Table 2, each criterion is evaluated on a scale of zero (0) to ten (10). The result will then be pro-rated according to the “Technical Points Available” (third column) using the “Rule of Three”.

Table 2 – Point Rated Technical Criteria

Criterion	Evaluation Method	Technical Points Available	Minimum Required
1. Understanding		12	6
<p>1.a The Bidder should demonstrate a thorough understanding of key issues related to Intelligence within the Government of Canada context, including other government departments (OGD) and Allies.</p> <p>The Bidder should describe major challenges that may be faced by the Intelligence community during the next five (5) years.</p> <p>The Bidder should demonstrate his awareness of related CF Intelligence initiatives and their potential relationships to FIAC. The Bidder should identify potential opportunities.</p> <p><i>The maximum number of pages to be submitted for this criterion is five (5) pages.</i></p> <p><i>Any pages (including attachments) which extend beyond the above page limitation will be extracted from the proposal and will not be forwarded to the Evaluation Board</i></p>	<p>10 – Excellent. The Bidder demonstrates a thorough understanding of the key issues and their relation to Intelligence. All the key issues are clearly identified. The Bidder describes at least four (4) challenges that may be faced by the Intelligence community. The challenges are pertinent and well supported. The Bidder relates at least five (5) major initiatives to FIAC scope and expands on potential opportunities.</p> <p>8 – Very good. The Bidder demonstrates a very good understanding of the key issues and their relation to Intelligence. Most key issues are clearly identified. The Bidder describes at least three (3) pertinent and well supported challenges that may be faced by the Intelligence community. The Bidder relates at least four (4) major initiatives to FIAC scope and expands on potential opportunities.</p> <p>6 – Good. The Bidder demonstrates a moderate understanding of the key issues and their relation to Intelligence. Most key issues are clearly identified. The Bidder describes at least two (2) pertinent and well supported challenges that may be faced by the Intelligence community. The Bidder relates at least three (3) major initiatives to FIAC scope and expands on potential opportunities.</p> <p>2 – Limited. The Bidder demonstrates a limited understanding of the key issues and their relations to Intelligence. Few key issues are identified. The Bidder describes at least two (2) pertinent and well supported challenges that may be faced by the Intelligence community. The Bidder relates only one (1) major initiative to FIAC scope and expands only on few potential opportunities.</p>	5	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<i>members for evaluation.</i>	<p>0 – Weak. The Bidder has failed to demonstrate an understanding of the key issues and their relation to Intelligence or key issues are not well identified or the Bidder expands on fewer than two (2) pertinent and well supported challenges that may be faced by the Intelligence community or the Bidder does not relate any major initiative to FIAC scope or expand on any potential opportunity.</p>		
<p>1.b The Bidder should clearly demonstrate in his own words his understanding of the context, scope and objectives of this Statement of Work (SOW).</p> <p><i>The maximum number of pages to be submitted for this criterion is three (3) pages.</i></p> <p><i>Any pages which extend beyond the above page limitation (including attachments) will be extracted from the proposal and will not be forwarded to the Evaluation Board members for evaluation.</i></p>	<p>10 – Excellent. The Bidder demonstrates, in his own words and in a clear and unambiguous way, an excellent understanding of the context, the scope and the objectives of the project as described in the SOW.</p> <p>8 – Very Good. The Bidder demonstrates, in his own words, a very good understanding of the context, the scope and the objectives of the project as described in the SOW.</p> <p>6 – Good. The Bidder demonstrates, in his own words, a good understanding of the context, the scope and the objectives of the project as described in the SOW.</p> <p>2 – Limited. The Bidder demonstrates, in his own words, a limited understanding of the context, the scope and the objectives of the project as described in the SOW.</p> <p>0 – Weak. The Bidder does not demonstrate, in his own words, an understanding of the context, the scope or the objectives of the project as described in the SOW.</p>	5	
<p>1.c The Bidder should articulate challenges/issues associated with transitioning R&D products or services to the Canadian Forces (CF).</p> <p><i>The maximum number of pages to be submitted for this criterion is three (3) pages.</i></p> <p><i>Any pages which extend beyond the</i></p>	<p>10 – Excellent. The Bidder describes in considerable detail more than three (3) significant challenges/issues associated with transitioning R&D products to the CF. The challenges/issues are pertinent and well supported.</p> <p>8 – Very Good. The Bidder describes in detail three (3) significant challenges/issues associated with transitioning R&D products to the CF. The challenges/ issues are pertinent and well supported.</p> <p>6 – Good. The Bidder describes in detail two (2) significant challenges/issues associated with transitioning R&D products to the CF.</p>	2	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<i>above page limitation (including attachments) will be extracted from the proposal and will not be forwarded to the Evaluation Board members for evaluation.</i>	<p>The challenges/ issues are pertinent and well supported.</p> <p>2 – Limited. The Bidder describes in detail one (1) significant challenge/issue associated with transitioning R&D products to the CF. Other challenges, if any, are not relevant, lack clarity or are not well supported.</p> <p>0 – Weak. The Bidder does not describe any significant challenge/issue in sufficient detail.</p>		

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
2. Corporate Capability		16	9
2.a The Bidder should provide evidence of successful R&D partnerships with a university or research organisation, related to IKM, HCI and Sensemaking as presented in Appendix 3 of Annex A, Statement of Work.	<p>10 – Excellent. The Bidder provides evidence of more than one (1) successful R&D partnership with a university or research organisation, related to IKM, HCI and Visualization, and Sensemaking and of a duration of one (1) year or more within the five (5) years preceding the date of the bid.</p> <p>6 – Good. The Bidder provides evidence of at least one successful R&D partnership with a university or research organisation, related to IKM, HCI and Visualization, and Sensemaking and of a duration of one year or more within the five (5) years preceding the date of the bid.</p> <p>0 – Weak. The Bidder does not provide evidence of a successful R&D partnership with a university or research organisation within the five (5) years preceding the date of the bid or the partnerships are not related to IKM, HCI and Visualization, and Sensemaking.</p>	2	
2.b The Bidder should clearly present its approach to optimize quality of work and value for dollars through the use of subcontractors, e.g., when a specific expertise is required that cannot be provided efficiently by the Bidder's resources.	<p>10 – Excellent. The Bidder proposes a clear strategy for using subcontractors to optimize quality of work and value for dollars, and exhibits a clear commitment to this approach in its bid.</p> <p>6 – Good. The Bidder proposes a clear strategy for using subcontractors to optimize quality of work and value for dollars, and exhibits some commitment to this approach in its bid.</p> <p>0 – Weak. The Bidder does not propose a clear strategy for using subcontractors to optimize quality of work and value for dollars and/or does not exhibit a clear commitment to this approach in its bid.</p>	8	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>2.c The Bidder should describe its IM/IT infrastructure and/or R&D platforms and how these are related to the existing infrastructure, as described in <u>"The information technology infrastructure of the ISTIP" Report, March 2013</u>, to perform the SOW tasks. The Bidder should describe how it is maintainable and how it can evolve and adapt to respond to future requirements and contexts.</p> <p><u>"The information technology infrastructure of the ISTIP" Report, March 2013, as indicated in section 2.5 -Applicable Documents of Annex A – SOW, can be obtained on CD through PWGSC.</u></p>	<p>10 – Excellent. The Bidder provides a detailed description of its IM/IT infrastructure and/or R&D platforms that support the C2I IM/IT strategy in a cost-effective way. The Bidder's description demonstrates in detail that its IM/IT infrastructure and/or R&D platforms exhibit the characteristics of maintainability, evolution and adaptability for new requirements and contexts.</p> <p>6 – Good. The Bidder provides a detailed description of its IM/IT infrastructure and/or R&D platforms that partially support the C2I IM/IT strategy in a cost-effective way. The Bidder's description demonstrates in detail that its IM/IT infrastructure and/or R&D platforms exhibit some of the characteristics of maintainability, evolution and adaptability for new requirements and contexts.</p> <p>0 – Inadequate. The Bidder has not provided a detailed description of its IM/IT infrastructure and/or R&D platform and/or the infrastructure or platform described does not support the C2I IM/IT strategy in a cost-effective way, and/or they are minimally or not compatible with the existing DRDC IM/IT infrastructure or the Bidder's description demonstrates few or no applicable characteristics of maintainability, evolution and adaptability for new requirements and contexts.</p>	3	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
2.d The bidder should describe its software engineering approach with the different architecture principles and standards used in the development of its software systems and how its approach and the development method reduce the development costs and risks and how it accelerates the innovation process.	<p>10 – Excellent. The Bidder provides an excellent description of its software engineering approach that is consistent with most of architecture principles and standards used in the development of software systems. The Bidder demonstrates that its software engineering approach and its development method effectively reduce the software development costs and risks and accelerate the innovation process.</p> <p>6 – Good. The Bidder provides a good description of its software engineering approach that is consistent with some of the architecture principles and standards used in the development of software systems. The Bidder is able to demonstrate that its software engineering approach and/or its development method may reduce the development costs and risks or accelerate the innovation process.</p> <p>0 – Inadequate. The Bidder does not provide a comprehensive description of its software engineering approach or it is not consistent with the architecture principles and standards used in the development of software systems or the Bidder is not able to demonstrate that its software engineering approach and/or development method may reduce the development costs and risks or accelerate the innovation process.</p>	3	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
3. Qualifications of Core Team Resources		33	23
<p>3.a The Bidder should propose a Project Manager, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.</p> <p>The proposal should detail the Project Manager experience and ability to successfully lead projects of similar nature in terms of domain (Intelligence or C2), size (at least fifteen (15) person-years) and complexity (R&D, S&T, multidisciplinary).</p>	<p>10 – Excellent. The Project Manager (PM) proposed exceeds the minimum experience required for Level 3, has successfully led four (4) or more major projects of similar domain, size and complexity and has a total of at least 20 years of experience in Project Management. Less years of experience may be compensated by a Master or Ph.D. diploma in Project Management.</p> <p>8 – Very Good. The Project Manager proposed meets the minimum experience required for Level 3, has successfully led three (3) or more major projects of similar size and complexity, and has a total of at least 15 years of experience in Project Management.</p> <p>6 – Good. The Project Manager proposed meets the minimum experience required for Level 3 and has successfully led three (3) or more major projects of similar size and complexity.</p> <p>0 – Weak. Any other situation.</p>	5	
<p>3.b The Bidder should propose an Enterprise Architect, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.</p>	<p>10 – Excellent. The resource proposed exceeds the minimum experience required for Level 3 and has a total of more than 20 years of experience in software system development.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 and has a total of more than 15 years of experience in software system development.</p> <p>0 – Weak. Any other situation.</p>	4	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
3.c The Bidder should propose a Systems Architect, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.	<p>10 – Excellent. The resource proposed exceeds the minimum experience required for Level 3 and has a total of more than 20 years of experience in software system development.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 and has a total of more than 15 years of experience in software system development.</p> <p>0 – Weak. Any other situation.</p>	4	
3.d The Bidder should propose a Sensemaking Specialist, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work. The proposal should clearly identify the resource's original and peer reviewed scientific research published in scientific journals and related to the field of Sensemaking.	<p>10 – Excellent. The resource proposed either has ten (10) years or more of experience with a Ph. D. related to the field of Sensemaking, or he has a total of more than 15 years of experience in this field. The resource has had at least five (5) original and peer reviewed scientific research papers published in scientific journals related to the field of Sensemaking.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 in the field of Sensemaking. The resource has had at least two (2) original and peer reviewed scientific research publications published in scientific journals related to the Sensemaking field.</p> <p>2 – Limited. The resource proposed meets the minimum experience required for Level 3 in the field of Sensemaking. Work is supported by at least one publication in open literature related to the Sensemaking field.</p> <p>0 – Weak. Any other situation.</p>	4	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>3.e The Bidder should propose a HCI and Visualisation Specialist, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.</p> <p>The proposal should clearly identify the resource's original and peer reviewed scientific research published in scientific journals and related to the fields of HCI and Visualisation.</p>	<p>10 – Excellent. The resource proposed either has ten (10) years or more of experience with a Ph.D. related to the HCI and Visualisation field, or he has a total of more than 15 years of experience in this field. The resource has had at least five (5) original and peer reviewed scientific research papers published in scientific journals and related to the field of HCI and Visualisation.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 in the field of HCI and Visualization. The resource has a total of more than 15 years of experience in this field. The resource has had at least two (2) original and peer reviewed scientific research papers published in scientific journals and related to the field of HCI and Visualisation.</p> <p>2 – Limited. The resource proposed meets the minimum experience required for Level 3 in this field. Work is supported by at least one publication in open literature related to the field of HCI and Visualisation.</p> <p>0 – Weak. Any other situation.</p>	4	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>3.f The Bidder should propose an Information/Knowledge Management Specialist, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.</p> <p>The proposal should clearly identify the resource's original and peer reviewed scientific research published in scientific journals and related to the field of Information/Knowledge Management.</p>	<p>10 – Excellent. The resource proposed either has ten (10) years or more of experience with a Ph.D. related to the field of Information/Knowledge Management, or he has a total of more than 15 years of experience in this field. He has at least five (5) original and peer reviewed scientific research papers published in scientific journals and related to the field of Information/Knowledge Management.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 in this field. He has a total of more than 15 years of experience in this field. He has at least two (2) original and peer reviewed scientific research papers published in scientific journals and related to the field of Information/Knowledge Management.</p> <p>2 – Limited. The resource proposed meets the minimum experience required for Level 3 in this field. Work is supported by at least one publication in open literature related to the field of Information/Knowledge Management.</p> <p>0 – Weak. Any other situation.</p>	4	
<p>3.g The Bidder should propose a Cognitive Specialist, Level 3, who meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.</p> <p>The proposal should clearly identify the resource's original and peer reviewed scientific research published in scientific journals and related to the field of Cognitive Science.</p>	<p>10 – Excellent. The resource proposed either has ten (10) years or more of experience with a Ph.D. related to the field of Cognitive Science, or he has a total of more than 15 years of experience in this field. He has at least five (5) original and peer reviewed scientific research papers published in scientific journals and related to the field of Cognitive Science.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 3 in the field of Cognitive Science. He has a total of more than 15 years of experience in this field. He has at least two (2) original and peer reviewed scientific research papers published in scientific journals and related to the field of Cognitive Science.</p> <p>2 – Limited. The resource proposed meets the minimum experience required for Level 3 in this field. Work is supported by at least one publication in open literature related to the field of Cognitive Science.</p> <p>0 – Weak. Any other situation.</p>	4	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
3.h The Bidder should propose an Intelligence Subject Matter Expert, Level 2, which meets the experience and expertise described in Appendix 2 – Category of Resources – of Annex A – Statement of Work.	<p>10 – Excellent. The resource proposed exceeds the minimum experience required for Level 2 and has a total of more than 20 years of experience in the field of Intelligence.</p> <p>6 – Good. The resource proposed meets the minimum experience required for Level 2 and has a total of more than 15 years of experience in the field of Intelligence.</p> <p>0 – Weak. Any other situation.</p>	4	

Criterion	Evaluation Method	Technical Points Available	Minimum Required
4. Methodology		19	11
<p>4.a The Bidder should describe its scientific research methodology and two (2) projects where this methodology has been successfully used to fulfill scientific R&D requirements.</p> <p>The Bidder should describe typical activities and deliverables executed under its scientific research methodology.</p> <p><i>The Bidder must describe each project submitted in accordance with Table 4 - Project Description Template. More precisely, the Bidder must submit the information in the format presented in Table 4 and provide all of the information that is requested in Table 4. Any project not described in accordance with Table 4 - Project Description Template - will not be considered by Evaluation Board members for evaluation.</i></p> <p><i>The maximum number of pages to be submitted for this criterion is three (3) pages (Projects described in accordance with Table 4 - Project Description Template – not included in this total).</i></p> <p><i>Any pages (including attachments) which extend beyond the above page limitation will be extracted from the proposal and will not be forwarded to the Evaluation</i></p>	<p>10– Excellent. The Bidder describes in detail a comprehensive scientific research methodology. This methodology will clearly meet all of the project's performance requirements and is consistent with the project's objectives. Moreover, the Bidder has clearly shown how the proposed research methodology will add value to the original specifications either by adding one or more new activities, producing additional deliverables or improving or expanding the project's content.</p> <p>The Bidder describes at least three (3) R&D projects where this scientific research methodology has been successfully applied.</p> <p>8 - Very good. The Bidder describes in detail a comprehensive scientific research methodology. This methodology will clearly meet most of the project's performance requirements and is consistent with the project's objectives. Moreover, the Bidder has clearly shown how the proposed research methodology will add value to the original specifications either by adding a new activity, a new deliverable or improving or expanding the project's content.</p> <p>The Bidder describes at least two (2) R&D projects where this scientific research methodology has been successfully applied.</p> <p>6 – Good. The Bidder describes a scientific research methodology which will meet some of the project's performance requirements and is, for the most part, consistent with the project's objectives. Moreover, the Bidder has shown that the proposed research methodology may add value to the original specifications by adding a new activity, a new deliverable or improving or expanding the project's content.</p> <p>The Bidder describes at least two (2) R&D projects where this scientific research methodology has been successfully applied.</p>	3	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<i>Board members for evaluation.</i>	<p>2 – Limited. The Bidder describes a scientific research methodology that meets few of the project's performance requirements and/or is not entirely consistent with the project's objectives. Moreover, the Bidder has not shown how the proposed research methodology will add value to the original specifications.</p> <p>The Bidder describes only one (1) R&D project where the scientific research methodology has been successfully applied.</p> <p>0 – Weak. The methodology meets few or none of the project's performance requirements and/or is inconsistent with the project's objectives or the methodology is not well described or is inadequate or the Bidder has not shown how the proposed research methodology will add value to the original specifications or in which R&D project the scientific research methodology has been successfully applied.</p>		
<p>4.b The Bidder should describe its system/software development methodology and how it can be tailored to the specific objectives of R&D projects and be flexible enough to accommodate change.</p> <p>The Bidder should identify significant issues related to the deployment of software system components developing I2 systems in an R&D context, and should propose success factors.</p> <p>The Bidder should indicate organisational and system/software development accreditations held at the time of the proposal submission, if applicable (e.g., CMMI).</p> <p><i>Note: A comprehensive methodology</i></p>	<p>10 – Excellent. The Bidder provides a detailed description of a system/software development methodology that is comprehensive. The methodology described can be tailored to the specific objectives of R&D projects and is flexible enough to accommodate changes. Moreover, it brings added value to the original specifications either by new activities or deliverables or through their content. The Bidder describes in considerable detail more than three (3) key issues and proposes more than three (3) success factors. The Bidder provides evidence of organisational and formal accreditations at a level of CMMI level 4 or higher. The accreditations are confirmed by references.</p> <p>8 - Very good. The Bidder provides a detailed description of a system/software development methodology that is comprehensive. The methodology described can be tailored to the specific objectives of R&D projects and is flexible enough to accommodate changes. Moreover, it brings added value to the original specifications either by new activities or deliverables or through their content. The Bidder describes in considerable detail more than two (2) key issues and</p>	2	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<i>that may be tailored to the nature and needs of R&D projects will be evaluated with a higher score. A higher CMMI level will be awarded more points.</i>	<p>proposes more than two (2) success factors. The Bidder provides evidence of organisational and formal accreditations at a level of CMMI level 2 or 3. The accreditations are confirmed by references.</p> <p>6 – Good. The Bidder provides a good description of a system/software development methodology that is comprehensive, however some of the activities or deliverables may not be appropriate. The Bidder describes two (2) key issues and proposes two (2) success factors. The Bidder lacks recognized organisational or software development accreditations.</p> <p>2 – Limited. The Bidder provides a limited description of a system/software development methodology. The method is not well described and/or many activities or deliverables may not be appropriate. The Bidder describes one (1) key issue and proposes one (1) success factor. The Bidder lacks recognized organisational or software development accreditations. There is no evidence of a formal organisational /software development accreditation or they are not confirmed by references.</p> <p>0 – Weak. The Bidder provides a poor description of a system/software development methodology. Most of activities and/or deliverables are not properly described or not appropriate or are not identified or the Bidder does not describe any significant key issue and success factor in sufficient detail or there is no evidence of a formal organisational or software development accreditation or they are not confirmed by references.</p>		
4. c The Bidder should propose a project management methodology suitable to a task authorisation contract, and based on rigorous processes and recognized standards. The Bidder should describe any tailoring considered advisable in order to manage large, medium and small-scale tasks: small (less than	<p>10 – Strong. No apparent weaknesses in the proposed project management methodology. The Bidder provides considerable detail in the description of the methodology, and demonstrates a thorough understanding of how the proposed methodology will be used to execute task authorisation contract. The Bidder illustrates how the methodology will be applied for contract management and provides suitable templates for the important reports. The Bidder demonstrates that the proposed approach has been successfully applied to at least</p>	8	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>100k\$), medium (between 100k\$ and 350k\$) and large tasks (more than 350k\$).</p> <p>The Bidder should clearly describe the structure with the role and responsibilities of each partner and/or sub-contractor to meet the expertise requirements for each domain or focus area. The Bidder should identify a single point of contact as being responsible for the overall management of the project. The Bidder should outline the use of software Project Management Tools for planning and schedule tracking.</p> <p><i>Notes: The Bidder who demonstrates that the proposed methodology has been successfully applied in similar projects in terms of size (monetary value between 100k\$ and 350k\$) and complexity (R&D, S&T, multidisciplinary) will be evaluated with a higher score.</i></p> <p><i>The Bidder should describe each project submitted in accordance with the information requested in Table 4 - Project Description Template. More precisely, the Bidder must submit the information in the format presented in Table 4 and provide all of the information that is requested in Table 4.</i></p> <p><i>Any project not described in accordance with Table 4 - Project Description Template - will not be considered by Evaluation Board members for</i></p>	<p>three (3) projects of similar size and complexity with software tools used for Project Management. The Bidder demonstrates a tailored management approach to deal with all kind of tasks when a DND 626 – Task Authorisation is raised. The Bidder illustrates very well how he proposes to deal with the size of tasks in the future.</p> <p>The Bidder provides a description of the structure with the role and responsibilities of each partner and/or sub-contractor to meet the expertise requirements for each domain or focus area.</p> <p>6 – Good. Weaknesses in the proposed project management methodology can be easily corrected. It addresses partial elements. The approach is well described; however, the description of some activities or deliverables lacks depth and detail. The Bidder demonstrates that the proposed approach has been successfully applied to at least two (2) projects of similar size and complexity with software tools used for Project Management.</p> <p>The Bidder demonstrates a good project management methodology to deal with most size of tasks when a DND 626 – Task Authorisation is raised. The Bidder illustrates how he proposes to deal with the size of tasks in the future.</p> <p>The Bidder provides a description of the structure with the role and responsibilities of each partner and/or sub-contractor to meet the expertise requirements for each domain or focus area.</p> <p>0 – Weak. The Bidder did not submit information which could be evaluated and/or few or no elements have been adequately addressed and/or the information provided is incomplete or the Bidder has not demonstrated that the proposed methodology has been successfully applied to similar projects of similar size and complexity or there is no evidence of software tools used for Project Management.</p> <p>There is a lack of details to appreciate how to deal with the size of authorisation tasks.</p>		

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<i>evaluation.</i>	The Bidder does not provide a clear description of the structure with the role and responsibilities of each partner and/or sub-contractor to meet the expertise requirements for each domain or focus area.		
4.d The Bidder should propose a Quality Management Approach tailored to the SOW requirements, indicate the quality standard certification held (such as ISO 9001, etc...) and quality planning, quality assurance and quality control processes and/or mechanisms to put in place to ensure quality of deliverables.	<p>10 – Excellent. The Bidder proposes an excellent Quality Management Approach, tailored to the SOW requirements, with no apparent weaknesses. He possesses a current and relevant quality standard certification. The Bidder proposes a strategy with well-developed quality processes and describes in detail the tools and techniques that will be used.</p> <p>6 – Good. The Bidder proposes a good Quality Management Approach with weaknesses that can be easily corrected, and describes partially some tools and techniques that will be used.</p> <p>0 – Weak. The Bidder does not propose a relevant Quality Management Approach or he proposes a poor Quality Management Approach with weaknesses that cannot be easily corrected.</p>	2	
4.e The Bidder should propose a Communication Approach and mechanisms that will be put in place to ensure good communication with DRDC personnel and DRDC partners. The Bidder should describe the tools and techniques he intends to use (e.g., optimum use of Video Tele-Conferencing, coordination and frequency of Project Review Meetings).	<p>10 – Excellent. The Bidder proposes an excellent Communication Approach with no apparent weaknesses. The Bidder's proposed strategy includes well-developed communication processes and describes in detail the tools and techniques that will be used. These tools and techniques are entirely consistent with the objectives presented in the SOW. The Communication Approach clearly sets out its strategy to facilitate effective interaction with DRDC personnel and partners.</p> <p>8 – Very good. The Bidder proposes a very good Communication Approach with very few or no apparent weaknesses. Any weaknesses are easily remedied. The Bidder's proposed strategy includes well-developed communication processes and describes in detail the tools and techniques that will be used. These tools and techniques are almost entirely consistent with the SOW. The Communication Approach clearly sets out its strategy to facilitate effective interaction with DRDC personnel and partners.</p>	2	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
	<p>6 – Good. The Bidder proposes a good Communication Plan with some weaknesses that can be easily corrected. The Bidder's proposed strategy includes a description of communication processes and the tools and techniques that will be used. These tools and techniques are moderately consistent with the SOW. The Communication Approach sets out its strategy to facilitate good interaction with DRDC personnel and partners.</p> <p>2 – Limited. The Bidder proposes few elements of a Communication Approach with weaknesses that should be corrected. There are few tools and techniques or most of them are not consistent with the SOW. The communication scheme proposed does not ensure the required interaction with DRDC personnel and partners.</p> <p>0 – Weak. The Bidder proposes elements of a Communication Approach with weaknesses that cannot be easily corrected or there are very few tools and techniques or they are not consistent with the SOW or there is no relevant collaboration or communication approach applicable for this task authorisation contract or the communication scheme proposed is not be sufficient to obtain required interaction with DRDC personnel and partners.</p>		

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
4.f The Bidder should describe the Risk Management Approach and processes that will be put in place in order to identify the most significant risks to the project and should propose a mitigation approach.	<p>10 – Excellent. The Bidder demonstrates an excellent understanding of the R&D project risks. The Bidder proposes a detailed Risk Management Approach that includes a description of its risk analysis method and a risk evaluation and mitigation approach which use tools and techniques that are consistent with the goals of the project.</p> <p>6 – Good. The Bidder proposes a good Risk Management Approach that includes a description of its risk analysis method and a risk evaluation and mitigation approach, and describes some tools and techniques that will be used.</p> <p>0 – Weak. The Bidder does not propose a Risk Management Approach or the Approach proposed is ill-defined or inconsistent with the project or the Bidder has not provided a detailed description of its risk analysis method or a risk evaluation and mitigation approach.</p>	2	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
5. Corporate Experience		20	11
<p>5.a The Bidder should describe at least two (2) R&D projects of at least three (3) person-years conducted during the last five (5) years immediately prior to the date of the bid and related to the IKM, HCI and Visualization, and Sensemaking fields as presented in Appendix 3 of Annex A (SOW).</p> <p><i>Notes: A Bidder that provides evidence of R&D projects conducted with collaboration at the international level will be evaluated with a higher score.</i></p> <p><i>The Bidder must describe each project submitted in accordance with Table 4 - Project Description Template. More precisely, the Bidder must submit the information in the format presented in Table 4 and provide all of the information that is requested in Table 4.</i></p> <p><i>Any project not described in accordance with Table 4 - Project Description Template - will not be considered by the Evaluation Board members for evaluation.</i></p>	<p>10 – Excellent. The Bidder describes at least five (5) R&D projects related to the IKM, HCI and Visualization, and Sensemaking fields, during the last five years. Among them, the Bidder has conducted at least two (2) R&D projects with collaboration at the international level.</p> <p>8 – Very Good. The Bidder describes at least four (4) R&D projects related to the IKM, HCI and Visualization, and Sensemaking fields, during the last five years. Among them, the Bidder has conducted at least two (2) R&D projects with collaboration at the international level.</p> <p>6 – Good. The Bidder describes at least three (3) R&D projects related to the IKM, HCI and Visualization, and Sensemaking fields, conducted during the last five years. Among them, the Bidder has conducted at least one (1) R&D project with collaboration at the international level.</p> <p>2 – Limited. The Bidder describes two (2) R&D projects related to the IKM, HCI and Visualization, and Sensemaking fields, conducted during the last five (5) years.</p> <p>0 – Weak. The Bidder describes less than two (2) R&D projects related to the IKM, HCI and Visualization, and Sensemaking fields, conducted during the last five (5) years.</p>	6	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>5.b The Bidder should provide the references of his scientific publications, made during the last five (5) years preceding the date of the bid, relevant to the IKM, HCI and Visualization, and Sensemaking fields as described in Appendix 3 of Annex A (SOW).</p> <p><i>Note: A Bidder that provides evidence of scientific publications relevant to Defence and/or produced in collaboration with R&D partners will be evaluated with a higher score.</i></p>	<p>10 – Excellent. The Bidder provides a list of at least six (6) scientific publications made during the last five (5) years, relevant to the IKM, HCI and Visualization, and Sensemaking fields, including R&D publications related to Defence (at least two (2) scientific publications). The Bidder provides evidence of scientific publications produced in collaboration with R&D partners (at least two (2) scientific publications).</p> <p>8 – Very Good. The Bidder provides a list of at least four (4) scientific publications made during the last five (5) years, relevant to the IKM, HCI and Visualization, and Sensemaking fields, including R&D publications related to Defence (at least one (1) scientific publication). The Bidder provides evidence of scientific publications produced in collaboration with R&D partners (at least one (1) scientific publication).</p> <p>6 – Good. The Bidder provides a list of at least three (3) scientific publications made during the last five (5) years, relevant to the IKM, HCI and Visualization, and Sensemaking fields, including R&D publications related to Defence (at least one (1) scientific publication). The Bidder provides evidence of scientific publications produced in collaboration with R&D partners (at least one (1) scientific publication).</p> <p>3 – Limited. The Bidder provides a list of at least two (2) scientific publications made during the last five (5) years, relevant to the IKM, HCI and Visualization, and Sensemaking fields.</p> <p>0 – Inadequate. The Bidder has provided a list of one or fewer of his scientific publications made during the last five (5) years, relevant to the IKM, HCI and Visualization, and Sensemaking fields.</p>	4	

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>5.c The Bidder should describe his past experience in designing, conducting, and analysing defence and/or security demonstrations and/or experiments.</p> <p><i>Note. The Bidder should describe his experience in demonstration or experimentation in a clear and concise manner, supported by published technical papers, the set of metrics used and experimental data collected.</i></p>	<p>10 – Excellent. The Bidder provides a comprehensive description of his experience in the full cycle of experimentation and the described experience covers all three (3) activities that are required. All demonstrations and/or experiments are supported by published technical papers.</p> <p>6 - Good. The Bidder provides a comprehensive description that of its experience in the full cycle of experimentation and the experience described covers two (2) or more activities that are required. All demonstrations and/or experiments are supported by published technical papers.</p> <p>2 - Limited. The Bidder has limited experience in the full cycle of experimentation. The described experience covers only one (1) of the three activities that are required and/or the demonstrations and/or experiments are not supported by published technical papers.</p> <p>0 - Weak. The Bidder does not provide a comprehensive description of its experience in the full cycle of experimentation or the described experience covers none of the activities that are required.</p>	2	
<p>5.d The Bidder should describe two (2) major projects (at least ten (10) person-years) successfully conducted with its system/software development methodology, as described in 4.c, and the number of years it has been consistently applied.</p> <p>Projects should be relevant to system architecture, software development and FIAC technologies identified in <i>The information technology infrastructure of the ISTIP Report, March 2013</i>, with respect to one of the following topics:</p> <p>i. SOA</p>	<p>10 – Excellent. The Bidder provides evidence that its methodology has been successfully used in more than two (2) major projects. The Bidder's methodology has been applied consistently during the last seven (7) years preceding the date of the bid.</p> <p>6 – Good. The Bidder provides evidence that its methodology has been successfully used in two (2) major projects. The Bidder's methodology has been applied consistently during the last five (5) years preceding the date of the bid.</p> <p>2 – Limited. Lack of evidence that the methodology described in 4.c has been successfully applied in the context of one (1) major project. The Bidder's methodology has been applied consistently during the last three (3) years preceding the date of the bid.</p>	4	

Mandatory and point rated technical criteria

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<ul style="list-style-type: none"> ii. Cloud Computing iii. Data Warehouse iv. All Source Information Integration v. Data/Information analysis and fusion <p><i>“The information technology infrastructure of the ISTIP” Report, March 2013, as indicated in section 2.5 - Applicable Documents of Annex A – SOW, can be obtained on CD through PWGSC.</i></p> <p><i>Note. The Bidder must describe each project submitted in accordance with Table 4 - Project Description Template. More precisely, the Bidder must submit the information in the format presented in Table 4 and provide all of the information that is requested in Table 4. Any project not described in accordance with Table 4 - Project Description Template - will not be considered by the Evaluation Board members for evaluation.</i></p>	<p>0 – Weak. Lack of evidence of a formal methodology or that the methodology described has been successfully applied in the context of a major project the Bidder’s methodology has not been applied consistently during the last three (3) years preceding the date of the bid.</p>		

Development of the Joint Intelligence and Information S&T Capability

Criterion	Evaluation Method	Technical Points Available	Minimum Required
<p>5.e The Bidder should demonstrate his experience developing I2 systems in either R&D or Defence by describing two (2) projects (at least one (1) person-year each) executed in the last seven (7) years preceding the bid.</p> <p><u>Notes:</u> <i>The Bidder who demonstrates experience in I2 development projects conducting requirement analysis in order to satisfy Intelligence needs for Defence will be evaluated with a higher score.</i></p> <p><i>The Bidder must describe each project submitted in accordance with Table 4 - Project Description Template. More precisely, the Bidder must submit the information in the format presented in Table 4 and provide all of the information that is requested in Table 4.</i></p> <p><i>Any project not described in accordance with Table 4 - Project Description Template - will not be considered by the Evaluation Board members for evaluation.</i></p>	<p>10 – Excellent. The Bidder provides a comprehensive description of his experience developing I2 systems for Defence (at least three (3) projects) during the last seven (7) years preceding the bid.</p> <p>8 – Very Good. The Bidder provides a comprehensive description of his experience developing I2 systems in either R&D or Defence (at least two (2) projects) during the last seven (7) years preceding the bid.</p> <p>6 – Good. The Bidder provides a comprehensive description of his experience developing I2 systems during the last seven (7) years (at least two (2) projects) preceding the bid; however, no more than one (1) project is related to either R&D or Defence.</p> <p>0 – Inadequate. The Bidder does not provide a comprehensive description of his experience developing I2 systems during the last seven (7) years (at least two (2) projects) preceding the bid or no project is related to either R&D or Defence.</p>	4	

Criterion Group	Technical Points Available	Minimum Threshold
Sub-Total for Understanding:	12	6
Sub-Total for Corporate Capability:	16	9
Sub-Total for Qualifications of Core Resources:	33	23
Sub-Total for Methodology:	19	11
Sub-Total for Corporate Experience:	20	11
Total of Technical Points/Minimum Threshold Total Score:	100	60

3. SUMMARY OF EXPERIENCE AND EXPERTISE TEMPLATE

The description for each resource experience and expertise shall be structured to include the following information:

- a. identification of the Bidder
- b. identification of the proposed resource
- c. identification of the resource type, as per Appendix 2 of Annex A – Statement of Work
- d. description of the relevant experience or expertise, as per Appendix 2 of Annex A – Statement of Work
- e. reference to the detailed CV where the experience or expertise of the proposed resource is described
- f. name of the mandate or initiative during which experience or expertise has been acquired
- g. name of the client or organization for whom the mandate was executed
- h. task duration, in months, performed by the resource and pertaining to the experience or expertise described
- i. total duration of the project or initiative, in months, in which experience or expertise has been acquired

Table 3 - Summary of Expertise and Experience Template

(a) Bidder:		(b) Resource:				
(c) Resource Type:						
(d) Relevant Experience or Expertise		(e) CV Reference	(f) Mandate	(g) Client	(h) Task Duration (mos)	(i) Project Duration (mos)

4. PROJECT DESCRIPTION TEMPLATE

The description for each project shall be structured to include the following information:

- a. identification of the Bidder
- b. identification of whether the Bidder was the prime contractor, a sub-contractor, or participant in a joint venture
- c. identification of the client : company name, as well as city and country where the client was located
- d. dollar value of the project
- e. starting and end dates of the project
- f. duration of the project (Full-time PY equivalent)
- g. brief description of the nature of the project
- h. list of typical activities and a description of the associated deliverables (in case of published papers, please provide full reference)
- i. relevance of the project against the criteria evaluated
- j. reference(s)

Table 4 - Project Description Template

(a) Bidder:			
(b) Project:		Prime Contractor: ___ Yes ___ No	Sub-Contractor: ___ Yes ___ No
(c) Client:		Country:	City:
(d) Dollar Value:	(e) Start Date:	End Date:	(f) Duration:
(g) Description:			

(h) Typical Activities and Deliverables	
Activities	Deliverables
1.	
2.	
3.	
4.	
5.	
(j) Relevance of the project against the criterion evaluated	
(k) Reference(s)	
Name:	Title:
Phone Number:	

Development of a Joint Intelligence and Information S&T Capability

ANNEX 'A'

STATEMENT OF WORK

Date of Issue: March 7, 2012

Table of Contents

1.	INTRODUCTION	1
1.1	Defence S&T Strategy	1
1.2	S&T Capability Management	3
1.3	S &T Challenges	3
1.4	DRDC Valcartier	3
1.5	Command, Control and Intelligence Section	4
1.5.1	Mission	4
1.5.2	Future Intelligence Analysis Capability	4
1.5.3	S&T Partner Engagement	5
1.5.4	Industry Engagement	5
2.	NATURE OF THE WORK	6
2.1	Aim of the Contract	6
2.2	Scope of the Work	6
2.2.1	T1 – FIAC Integration and Project Management	9
2.2.2	T2 – Infrastructure Development and Maintenance	9
2.2.3	T3 – Research, Technology and Analysis Program	11
2.2.4	T4 – Development, Engineering and Evaluation Program	12
2.3	Deliverables	12
2.4	Resources	13
2.5	Applicable Documents	14
3.	CONDUCT OF WORK	16
3.1	Location of Work	16
3.2	Language of Work	16
3.3	Hours of Work	16
3.4	Travel	16
3.5	Government Furnished Equipment	16
3.6	Publications	16
3.7	Documents to Be Provided to the Contractor	17
	APPENDIX 1 ACTIVITY DESCRIPTION	18
	Project Management	18
	Collaboration	18
	Research	18
	Analysis	19
	Architecture and System Development	20
	Test-bed and Integration Platform Development	21
	Configuration Management and System Administration	22
	Technical Support	22
	Exploitation	22
	Subject Matter Expertise	23
	Human Factors	23
	Experimentation and Demonstration	24
	APPENDIX 2 CATEGORIES OF RESOURCES	26
1.	System and software Development	26
1.1	A.1 - Software Architect	26
1.2	A.2 - Enterprise Architect	29
1.3	A.3 - Systems Architect	30
1.4	A.4 - Data Architect	32
1.5	A.5 - Software Analyst	33
1.6	A.6 - Business Analyst	35
1.7	A.7 - Data Modeling Analyst	36
1.8	A.8 - Data Administration Analyst	37
1.9	A.9 - Security Analyst	39
1.10	A.10 - Network Analyst	40
1.11	A.11 - Test Coordinator Analyst	41

1.12	A.12 - Geomatics Analyst	42
1.13	A.13 - Software Lead Developer	44
1.14	A.14 - Geomatics Lead Developer	46
1.15	A.15 - Software Programmer	49
1.16	A.16 - Database Programmer	50
1.17	A.17 - Tester Programmer	52
1.18	A.18 - System Administration Programmer	53
1.19	A.19 - Scenario Developer Specialist	54
1.20	A.20 - Training Developer Specialist	54
2.	Management	56
2.1	M.1 - Project Manager	56
2.2	M.2 - Project Assistant	57
2.3	M.3 - Project Administrator	58
2.4	M.4 - Project Leader	59
2.5	M.5 - Quality Assurance Analyst	59
2.6	M.6 - Technical Writer	60
2.7	M.7 - Group Facilitator	60
3.	Science and Technology	62
3.1	S.1 - Sensemaking Specialist	62
3.2	S.2 - Sensemaking Analyst	63
3.3	S.3 - Sensemaking Lead Developer	63
3.4	S.4 - Information/Knowledge Management Specialist	64
3.5	S.5 - Information/Knowledge Management Analyst	65
3.6	S.6 - Information/Knowledge Management Lead Developer	65
3.7	S.7 - Human-Computer Interaction and Visualisation Specialist	66
3.8	S.8 - Human-Computer Interaction and Visualisation Analyst	67
3.9	S.9 - Human-Computer Interaction and Visualisation Lead Developer	67
3.10	S.10 - Cognitive Specialist	68
3.11	S.11 - Operations Research Analyst	70
3.12	S.12 - Operations Research Lead Developer	70
4.	Military Expertise	72
4.1	E.1 - Intelligence Subject Matter Expert	72
4.2	E.2 - Command & Control Subject Matter Expert	72
	APPENDIX 3 SCIENCE and TECHNOLOGY EXPERTISE	74
	APPENDIX 4 TECHNOLOGY READINESS LEVELS	80
	List of acronyms	85

List of Figures

FIGURE 1: THE S&T STRATEGY CAPABILITIES 2

FIGURE 2: S&T PROGRAMS 7

List of Tables

TABLE 1 - TYPICAL ACTIVITIES 8

TABLE 2 - TYPICAL DELIVERABLES 13

TABLE 3 - TECHNOLOGY READINESS LEVELS IN THE DEPARTMENT OF DEFENSE (DoD) 81

TABLE 4 - SOFTWARE-SPECIFIC DEFINITION, DESCRIPTION AND SUPPORTING INFORMATION OF TRL..... 82

1. INTRODUCTION

Defence Research and Development Canada (DRDC) undertakes research and analysis and provides advice that assists the Department of National Defence (DND) and the Canadian Forces (CF) in making important decisions. DRDC is working with DND to develop the Strategic Capability Roadmap which will outline the capabilities the CF will require over the next 20 years to be able to carry out their anticipated missions. DRDC is seeking industry support for a long-term R&D effort in the Intelligence domain. To demonstrate future concepts for 'Intelligence Analysis', it will be necessary to exploit and develop expertise in a broad range of science and technology areas – within government, industry and academia.

1.1 Defence S&T Strategy

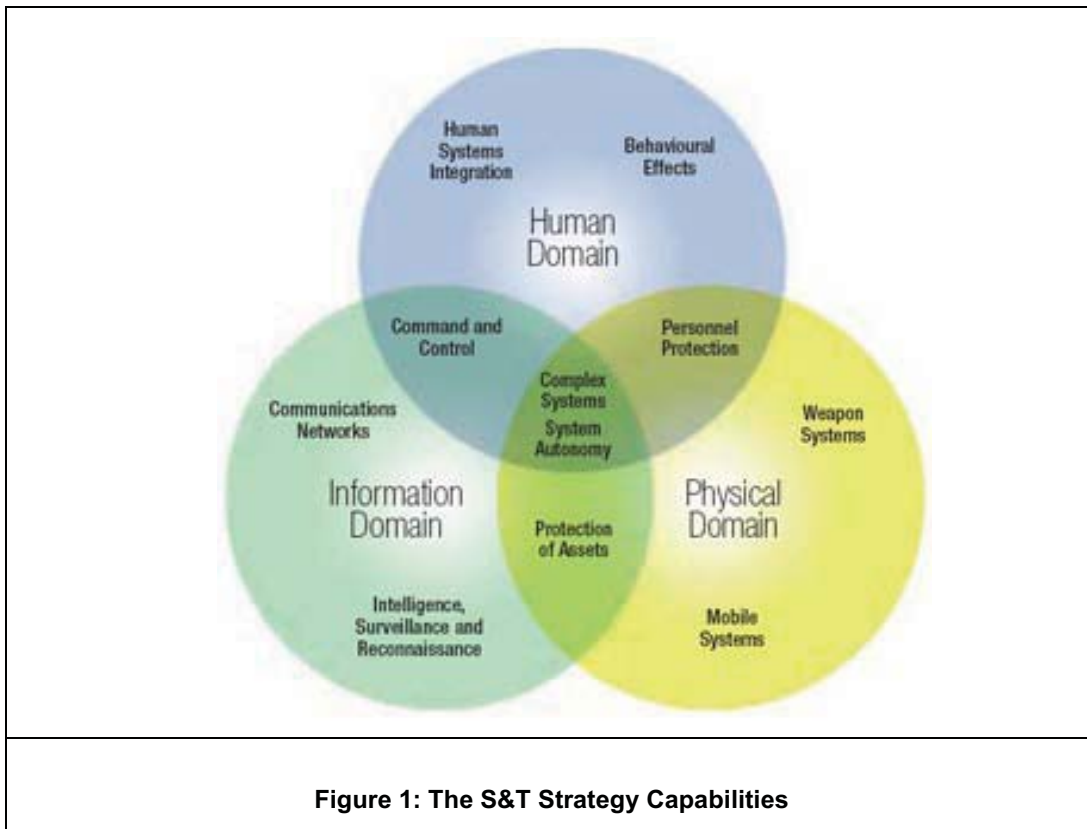
The Defence S&T Strategy¹ released by the Department of National Defence in December 2006 was the first-ever pan-departmental guidance document for defence Science and Technology (S&T). It provides guidance to ensure that the departmental S&T investment is appropriately aligned with the priorities of the CF Transformation and DND's institutional alignment, and is properly harnessed to support the defence institution and its core business processes. In order to achieve this objective, the *Strategy* identifies four primary action areas:

1. Establishing a horizontal/functional governance mechanism, or a matrix organization within the CF and DND that connects S&T providers and users, also called the "Defence S&T Enterprise";
2. Developing a "full-service" defence S&T capability that serves all departmental core processes;
3. Developing strategic partnerships both within the department and the CF, as well as with Canadian and international partners in government, industry and academia; and
4. Establishing enablers to ensure a supportive environment for effective internal and external partnerships and timely exploitation of S&T outputs.

The Defence S&T Strategy identifies eight strategic mission-critical outcomes that target Canadian Forces and departmental capability objectives where S&T can contribute. These outcomes are derived from departmental objectives enunciated in policy and strategic guidance, albeit refined appropriately to explicitly express the expectations for S&T.

The *Defence S&T Strategy* also identifies eleven primary areas of S&T expertise or capabilities in which critical mass must be maintained in order for the departmental S&T investment to be able to reliably affect the mission-critical outcomes. As shown in Figure 1 these S&T areas group into three domains: physical, information and human. A number of these areas include aspects of more than one domain. For each area, a set of S&T challenges is defined that represents what are considered the most important scientific and technical obstacles that must be overcome. These challenges help to further clarify and focus the effort to establish the S&T expertise.

¹ Available at Defence S&T Strategy, <http://www.drdc-rddc.gc.ca/drdc/wp-content/uploads/strat-eng.pdf>, accessed June 2012.



These mission-critical outcomes and capabilities are expected to be enduring for the shelf-life of this strategy, but must be reviewed periodically to ensure that they remain consistent with defence strategy documents, as they evolve.

To deliver these mission critical outcomes, the Defence S&T Strategy introduces two complementary programs of work for managing the departmental S&T investment.

First, the Research, Technology and Analysis (RTA) Program provides focused research activities addressing knowledge generation needs across all departmental core processes, explores and advances emerging technologies at the early to mid Technology Readiness Levels² including technology demonstration, and conducts targeted operational research and analysis to provide support to decision makers across the Canadian Forces and Department.

The RTA Program is managed strategically through an annual planning cycle that commits effort to a balance of both multi-year and short-term projects. Many Canadian Forces and departmental organizations are engaged in the formulation and execution of the RTA Program.. The departmental lead for the RTA Program resides with the Assistant Deputy Minister (Science and Technology).

Second is the Development, Engineering and Evaluation (DEE) Program which enables the evaluation, maturation and transition of technologies with the potential to deliver identified capability needs, supports the science- based and engineering-based investigation of service life

² Technology Readiness Levels (TRL) are a measure of the state of maturity of technology that range from the observation of basic principles through the various stages of concept evaluation, development and testing to prototype evaluations and full implementation into operational systems.

issues and on occasion supports the targeted development of technological or system solutions to meet specific defence acquisition needs.

The selection of DEE Program activities and related investment decisions is driven primarily by individual business cases or by the needs of materiel acquisition and support functions as they arise.

As such, the DEE Program is managed primarily on a case-by-case or project basis, without an overarching annual program formulation cycle. Activities are delivered through a blend of internal and external capabilities, most typically under the management of staff within the Materiel or IM Groups, or within the Canadian Forces force generation staff. DEE activities regularly reach back into the knowledge and expertise generated within the RTA Program. The departmental lead for the DEE Program is shared between the Assistant Deputy Ministers (Materiel) and (Information Management).

1.2 S&T Capability Management

One important responsibility DRDC scientific section managers have is to manage an S&T Capability. DRDC Section Heads have to define, maintain, assess and evolve a S&T Capability area, its challenges, and, by extension, the program that develops it, with respect to the four (4) dimensions of an S&T Capability. These dimensions are:

- infrastructure, equipment, and tools to conduct the S&T research;
- quality of the expertise and knowledge of the scientific staff;
- management of the S&T Capability and its R&D programs (RTA and DEE); and,
- required internal and external partnerships and collaborations.

1.3 S & T Challenges

The complexity of the challenges facing the CF over the next two decades will demand innovative means and technologies to support the Intelligence function. Among the eleven primary areas of S&T expertise identified in the Defence S&T Strategy, the support to the Intelligence function is situated within the 'Command and Control' area. (This S&T area of expertise excludes sensors and target recognition, which fall outside the scope of this requirement.) The following S&T challenges are defined for Command and Control and applicable to this requirement:

- Enhanced decision-making in C2 environments;
- Flexible and adaptable C2 concepts and structures for achieving common intent;
- Effects-based visualization and awareness for the decision maker;
- Information Fusion and Knowledge Management and Representation;
- Software Protection and Counter Measures.

1.4 DRDC Valcartier

Scientific teams are employed in nine Defence R&D Centres located across Canada, each with a highly specialised domain of expertise. DRDC Valcartier is DRDC's main facility for combat, optronics and information systems and is renowned for its leading-edge work performed through many bilateral and multilateral alliances and under NATO agreements. DRDC Valcartier has developed a strong cadre of scientists with expertise in information and knowledge exploitation and is currently shaping a number of future capability areas to support the CF mission, including Intelligence. The C4ISR Sector is organised into four (4) sections to conduct

research and development in the following areas: Command, Control and Intelligence, Mission Critical Cyber Security, Spectral and Geospatial Exploitation, and Tactical Surveillance & Reconnaissance. Work is underway to develop concepts and technologies for future integrated and interoperable C4ISR capabilities.

1.5 Command, Control and Intelligence Section

1.5.1 Mission

The mission of the Command, Control and Intelligence (C2I) Section is to define and evolve the S&T Capability area related to the All-Source Intelligence Analysis capability within the Intelligence function. The C2I Section is responsible for a subset of the S&T challenges identified for CF C2 which includes important scientific and technical obstacles that must be overcome within the Intelligence domain. The Section comprises four (4) scientific groups; each with a focus area related to intelligence analysis; each of which will contribute to an integrated FIAC:

- All-Source Intelligence Management;
- Sense Making;
- Comprehensive Decision Support;
- Future C2I Operations Center Design.

1.5.2 Future Intelligence Analysis Capability

The Future Intelligence Analysis Capability (FIAC) is an ambitious R&D Program being proposed by DRDC Valcartier. The core objective of this R&D Program is to advance the state-of-the-art of intelligence methods and resources in order to adapt to and anticipate the new challenges of the CF. FIAC seeks to address the exacting demands of intelligence in the modern operating terrain and the expanding uncertainties that the CF are facing, as exemplified in the *Joint, Interagency, Multinational, Public* (JIMP) context³.

The FIAC scope addresses information services from an all intelligence sources perspective and over the full Intelligence cycle. Among these services, a particular emphasis is on achieving advanced analysis capabilities. This future capability seeks, in particular, to achieve an optimized level of synergy between human cognition and machine intelligence, fully exploiting collaborative interaction.

FIAC has multiple facets that need to be carefully balanced and integrated. With its hub located at DRDC Valcartier, FIAC will be able to exploit and leverage considerable expertise that is available within DRDC, as well as throughout the DRDC research network and international collaborations.

The FIAC vision is derived bearing in mind recent and on-going DRDC Valcartier research projects that have produced world-class research. These projects have been unequivocally successful. However, their deployment has had significant constraints in terms of portability and system of system integration. System integration is essential for the success of the Intelligence cycle. This ambitious R&D Program will involve collaboration within the broad DRDC research network, with Canadian industries, academia, expertise from the CF and interactions with allies.

³ Mr. Peter Gizewski and Lieutenant-Colonel Michael Rostek, Toward a JIMP-Capable Land Force, Canadian Army Journal, Vol. 10.1, Spring 200, http://www.army.forces.gc.ca/caj/documents/vol_10/iss_1/CAJ_vol10.1_09_e.pdf, accessed June 2012, pp. 55-72.

Proposing the FIAC as a R&D Program rather than a set of Projects provides a long-term (15-20 years), integrated vision towards the development of advanced intelligence capability. This vision, in turn, is to be derived from an assessment of the needs of the CF over the years. It will be together with a detailed appreciation of the world-wide best-of-breed S&T activities, as to their potential to contribute. FIAC will thus provide a framework for guidance for the execution, management and planning of relevant R&D activities.

1.5.3 S&T Partner Engagement

The development of a FIAC will require a multi-disciplinary effort and a coordinated approach to engage the expertise of scientists from other Sections within the C4ISR Sector as well as scientists located in other Defence R&D Centres. Guidance will be provided primarily through the appropriate Thrust Advisory Group(s). The Information and Intelligence Section will work closely with Chief of Defence Intelligence (CDI), which is the organization responsible for the CF's Intelligence capability, including requirements definition. Collaboration will also be required with the Army G2, ADM (IM) and other DND stakeholders to ensure that interoperability and integration issues are addressed early in the development process. This will also require the involvement of industry, academia and other government departments (OGDs) and agencies, e.g., RCMP. In addition, Allies initiatives will be leveraged through existing programs, e.g., The Technical Cooperation Program (TTCP).

1.5.4 Industry Engagement

DRDC recognizes that considerable domain knowledge and technical expertise reside within industry. Therefore, industry is expected to be a key contributor to the development of the CF's FIAC. DRDC seeks collaboration with industry, the military community and academia, to fully exploit the broader Canadian knowledge base. DRDC seeks an industry leader that has the ability to harness knowledge and expertise in a number of scientific and technical domains, is committed to developing new expertise and technologies as the FIAC evolves, understands the complexity of the S&T challenges and is able to support DND to transition S&T products into CF C4ISR capabilities. DRDC seeks industry investment knowledge and capacity in order to leverage existing resources and infrastructure, and to demonstrate industry's commitment to contribute to this long-term initiative.

2. NATURE OF THE WORK

2.1 Aim of the Contract

DRDC recognizes the need to develop new strategies for working with industry within the parameters of a multi-year, multi-million dollar Contract. This Contract vehicle is intended to provide the flexibility necessary for DRDC to work more effectively with industry to tackle some of the CF's most important challenges. It will also provide an effective mechanism for DRDC to transfer knowledge to industry, thereby promoting further development of the defence industrial base and the broader Canadian economy.

This Statement of Work (SOW) provides the foundation for an innovative approach with S&T partners (industry, academia, Allies) and S&T stakeholders. The resulting Contract has two primary objectives. First, it is intended to bring coherence to the delivery of the overall scientific program by seeking S&T partner and stakeholder engagement and support, to ensure coherence, relevance and integration, in the evolution of the C2I Section S&T capability. This S&T capability will be defined and managed according to an overarching FIAC vision. Second, it will support the development of the FIAC. Based on a spiral development approach, FIAC – Spiral 1 will be developed during the initial contract period, with additional development work to be conducted during the Contract option periods and in subsequent contracts.

Development of the FIAC is a multidisciplinary initiative. DRDC Valcartier seeks a Contractor - or Consortium - to contribute to the C2I Section's S&T capability (in all four (4) dimensions of an S&T Capability, as per 1.2), development and management. This SOW describes the activities that will be required to develop a Joint Intelligence and Information S&T Capability. The work to be performed is the provision of services to DRDC and DND on an *as and when required* basis to analyse, design, develop, exploit, and support FIAC- related components and extend the scientific background and knowledge base related to Intelligence.

2.2 Scope of the Work

Figure 2 illustrates the full range of S&T programs conducted by DRDC and the relative capability maturity levels of each. Further information regarding Technology Readiness Levels (TRL) is provided at Appendix 4.

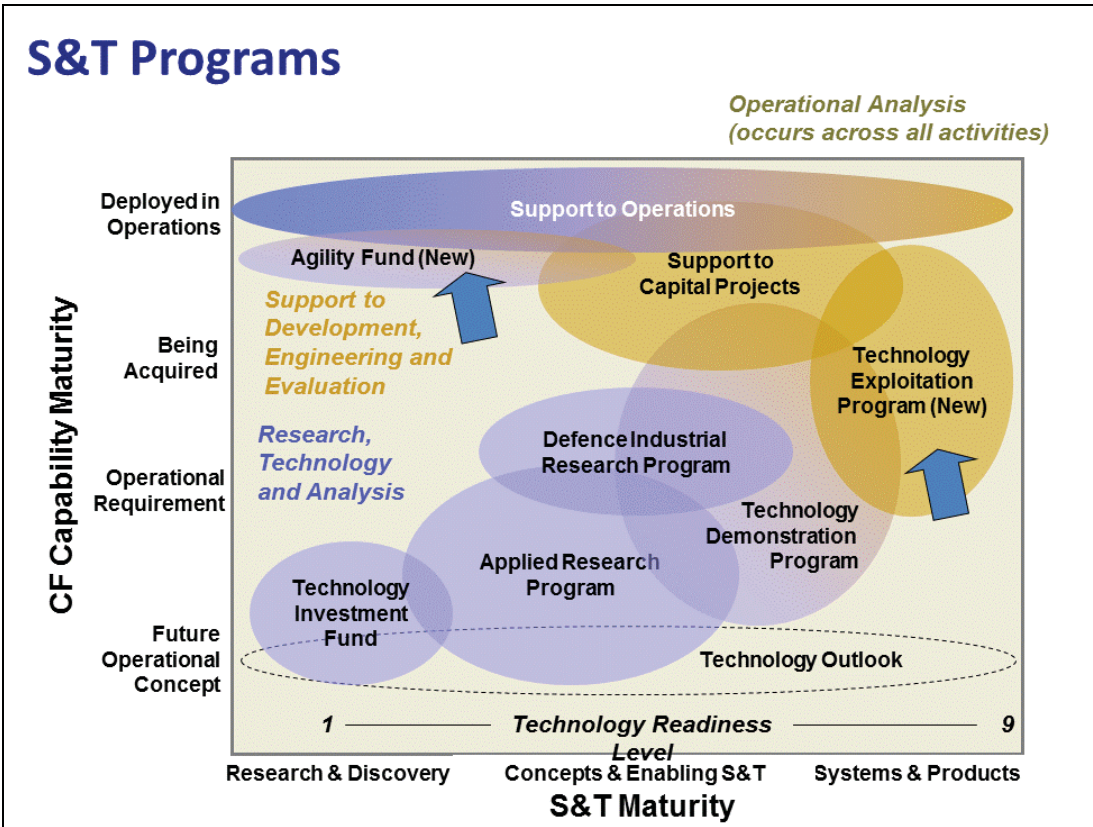


Figure 2: S&T Programs

Note: Technology Readiness Levels (TRL) are a measure of the state of maturity of technology that ranges from the observation of basic principles through the various stages of concept evaluation, development and testing to prototype evaluations and full implementation into operational systems.

In the context of this requirement, the Contractor may be required to contribute to the full range of S&T programs within the C2I Section. Typical activities that may be conducted under any one of these S&T programs are identified in Table 1. Appendix 1 provides a description of the Activities identified in Table 1.

Table 1 - Typical Activities

<p><u>Research / Analysis</u></p> <ul style="list-style-type: none"> • Science & Technology Watch • State-Of-The-Art Study • S & T Trend Study • Product Review • Feasibility Study • Technical Study • Concept Formulation/Exploration • Modeling • Provide Expert Advice • System/Software Technical Specification <p><u>Project Management</u></p> <ul style="list-style-type: none"> • Integration, Scope, Time, Cost, Quality, Human Resource, Communications, Risk, Procurement Management <p><u>Collaboration</u></p> <ul style="list-style-type: none"> • Support National Collaboration Initiatives (Government, University, Industry) • Support International Collaboration Initiatives (TTCP, NATO, etc.) • Provide Facilitation Services <p><u>Architecture</u></p> <ul style="list-style-type: none"> • Study / Design / Assessment <ul style="list-style-type: none"> – Processing Paradigms – Interoperability – Enterprise Architecture – CONOPS Development • System-of-System Integration <p><u>Performance Evaluation Infrastructure</u></p> <ul style="list-style-type: none"> • Laboratory Development/Maintenance • Test-bed Development/Maintenance <p><u>Quality Assessment / Performance Evaluation</u></p> <ul style="list-style-type: none"> • Evaluation Methodology Development • Metrics Development • Scenario Development • Dataset Development • Modeling and Simulation <p><u>Demonstration/Experimentation</u></p> <ul style="list-style-type: none"> • Formulation, Planning • Management • Execution • Data Collection and Analysis • Technical Support • Participation in Exercises 	<p><u>Domain Analysis</u></p> <ul style="list-style-type: none"> • Requirement Engineering • Analysis <ul style="list-style-type: none"> – Goal/ Functional – Capability – Domain Concepts/Relationships – Critical Decision – Information Requirements – Presentation Requirements – Problems/Gaps/Deficiencies • Business Modeling • Human Factor/Cognitive Engineering <ul style="list-style-type: none"> – Task/Work Analysis – Ergonomic Study – Automation Study • Knowledge Engineering <ul style="list-style-type: none"> – Acquisition/Elicitation – Modeling/Representation – Ontological Engineering – Validation • Data Modeling <p><u>System/Software Engineering</u></p> <ul style="list-style-type: none"> • Requirements Analysis • Architectural Design • Detailed Design • Mock-Ups, Proof-Of-Concepts, Components, Systems/Subsystems, Prototypes, Production Systems Development • Coding and Testing • Integration • Qualification Testing • Installation • Acceptance Support <p><u>System / Software Transition / Exploitation</u></p> <ul style="list-style-type: none"> • System and User Documentation • User Training • System Administration • System / Hardware / Software Maintenance • Configuration and Change Management • Installation / Technical Support • Hardware/Software Procurement • System Certification & Accreditation • Data Migration / Loading / Staging / Balancing • Promotion / Marketing <ul style="list-style-type: none"> – Quad Chart / Fact Sheet / Poster production – Joint (with DRDC/DND) scientific articles
--	---

For the purpose of this SOW, a group of tasks have been defined: Tasks 1-4 (T1 – T4). Each task comprises sub-tasks, activities and related sub-activities that may be required to contribute to the development and management of the Joint Intelligence and Information S&T Capability. Activities identified for T1 to T4 will be initiated using a task authorisation process, as and when required.

2.2.1 T1 – FIAC Integration and Project Management

The activities to be conducted under T1 are intended to contribute to the FIAC Integration and the management of Contractor projects. Activities may include:

- Integration of the FIAC;
 - Provide orientation for scenario development, technical standards for development and infrastructure, including DB structures, test-bed and development tools (HW and SW).
 - Recommend or adapt project and information management tools, project management processes, administrative structures (Steering Committee, Technical Committee), project deliverables management and archiving (studies, source code, reports) to suit the needs of the C2I Section.
 - Implement tools and processes for follow-up with respect to the S&T Program Management Plan and FIAC – Spiral 1 progress.
 - Support the realisation of a coherent FIAC Vision through initiatives designed to create convergence within the stakeholder community (i.e., requirements, CONOPS, operational lessons learned, acquisitions).
 - Evaluate ongoing projects and participate in the definition of future projects.
 - Collaborate with stakeholders.
- FIAC Project Management
 - Administer the Contract and ensure the required planning and control of all Contract activities;
 - Manage the overall processes of architecting, designing, developing, deploying and maintaining the FIAC, related components and supporting infrastructure.

Table 1 provides a list of typical activities that may be undertaken for FIAC – Spiral 1 under Task T1 while Appendix 1 provides a description of the activities identified in Table 1. Appendix 2 provides details about each category of resources that may be required to contribute to the FIAC Integration and the management.

2.2.2 T2 – Infrastructure Development and Maintenance

The fulfillment of the C2I Section's mission relies on the implementation of an appropriate IM/IT environment. This environment must alleviate the integration of the different services into a coherent ecosystem and promote their collaboration. Moreover, this environment must facilitate the TRL maturity process by providing stimulation, simulation and performance evaluation capabilities. This environment is comprised of three (3) main capabilities:

- Intelligence Science & Technology Integration Platform (ISTIP);
- Multi-Intelligence Tool Suite (MITS);
- Multi-Intelligence Capability Test Bed (MICTB).

ISTIP – The ISTIP is a Service-Oriented Architecture (SOA) platform for the iterative and incremental development and integration of the innovative, loosely coupled, reusable, composable and interoperable services required to perform tasks in computer-based intelligence support systems. The primary objective of the ISTIP is to facilitate the integration of new or already existing services into a consistent and well-organized system. The second main objective of the integration platform is to promote innovation through a computing ecosystem first and foremost based on collaboration, reusability and adaptability.

MITS - The MITS is a federation of innovative, composable and interoperable intelligence related tools which exploit the ISTIP services into an overall, continuous process flow relevant to the intelligence community. The MITS is the main entry point through which the user exploits the services residing on the ISTIP. Through the MITS, services are triggered and composed in order to realize a set of functionalities.

MICTB – The MICTB is an environment containing the hardware, instrumentation, simulators, software tools, datasets and other support elements needed to conduct testing and evaluation, in a laboratory environment, of multi-intelligence capabilities. The main objective of the MICTB is to test and evaluate both the technical and functional performance of the integration platform and its integrated services. This latter objective supports the TRL maturity process by providing a set of capabilities that allows realistic stimulation and performance measurements of the system. The MICTB is also responsible to provide the required infrastructure in order to execute integration and system tests regarding the integration platform. Finally, it has the capacity to let defence scientists easily investigate S&T concepts with or without the use of the integration platform. The MICTB can be seen as an adaptable technology environment in which the integration platform is stimulated, evaluated and exposed to data and constraints that are similar to operational CF system baselines.

To support the aforementioned capabilities, the C2I Section can leverage four (4) physical infrastructures:

- Intelligence Laboratory (I-Lab);
- System Integration Laboratory (LIDS);
- Intelligence Mobile Laboratory (Int Mobile Lab);
- Canadian Forces Warfare Centre (CFWC).

I-Lab – The I-Lab is located at DRDC Valcartier and is the place where intermediate architectures of the FIAC are instantiated. The I-Lab is also the primary facility for the demonstration of the FIAC.

LIDS – The LIDS is a facility located at DRDC Valcartier where development, demonstration, experimentation and integration activities can occur. It provides rooms, network connectivity, and audio/video capabilities. The C2I Section is using it to host and to implement key building blocks of its IT infrastructure.

Int Mobile Lab – The Int Mobile Lab is a mobile (53 feet tractor trailer) infrastructure equipped with re-configurable workspaces, network connectivity and audio/video capabilities trailer that can host people and IT infrastructure for conducting classified experimentation up to level 3 activities.

CFWC - Collaboration may occur between DRDC Valcartier and the CF Warfare Centre (CFWC) in order to conduct demonstration and experimentation employing operational CF and Allied system baselines.

The activities to be conducted under T2 are intended to contribute to the full range of Infrastructure Support initiatives for FIAC - Spiral 1. Activities identified for T2 will be initiated using a task authorisation process, as and when required, for:

- Architecture and System Engineering;
- MITS, ISTIP and MICTB Development;
- Configuration Management and System Administration.

The ISO/IEC/IEEE 12207 Standard⁴ provides a common framework for software life cycle processes and defines the terminology. This document will be used as reference when applicable.

Table 1 provides a list of typical activities that may be undertaken for FIAC – Spiral 1 under Tasks T2 while Appendix 1 provides a description of the activities identified in Table 1. Appendix 2 provides details about each category of resources that may be required to execute Infrastructure Development and Maintenance activities.

2.2.3 T3 – Research, Technology and Analysis Program

The Research, Technology and Analysis Program (RTA) provides focused research activities addressing knowledge generation needs across all departmental core processes, explores and advances emerging technologies at the early to mid-Technology Readiness Levels (TRL 1-6), including technology demonstration, and conducts targeted operational research and analysis to provide support to decision makers across the CF and DND.

The activities to be conducted under T3 are intended to contribute to the full range of RTA initiatives related to 'intelligence analysis'. The FIAC Information Package, which includes the FIAC White Paper⁵, provides a vision for how novel technologies could be used to implement the FIAC-Spiral 1. Table 1 provides a list of typical activities that may be undertaken for FIAC – Spiral 1 under Task T3 while Appendix 1 provides a description of the activities identified in Table 1. Appendix 2 provides details about each category of resources that may be required to perform work within the RTA Program to develop and maintain the FIAC – Spiral 1.

Tasks identified for T3 will be initiated using a task authorisation process, as and when required. The tasks may concern:

All-Source Intelligence Management: The nature of the work in this area aims at investigating novel concepts, techniques and technologies for the description, organization, management and integration of large and heterogeneous sources of information and intelligence products (multi-INT). The objective is to provide added value to collected data for the production of intelligence and sensemaking activities. Research address information management challenges related to individual intelligence disciplines, e.g. open source, geospatial intelligence, but also address all-source management and integration challenges. Interoperability issues, information sharing and collaboration are also considered.

The work addresses the intelligence lifecycle, in particular direction, collection, dissemination, and support intelligence processes such as Intelligence Preparation of the Battlespace (IPB), and Commander's Critical Information Requirements Management (CCIRM). Enabling technologies that are investigated in this context include, but are not

⁴ ISO EAI 12207 [12207 - ISO/IEC/IEEE Standard for Systems and Software Engineering - Software Life Cycle Processes](http://standards.ieee.org/findstds/standard/12207-2008.html) , <http://standards.ieee.org/findstds/standard/12207-2008.html>, accessed May 2012.

⁵ Poussart, D. FIAC White Paper, DRDC Valcartier Memorandum, 2010.

limited to, advanced information and knowledge management, metadata standards, semantic technologies, and service-oriented architectures.

Sensemaking: The nature of the work in this area encompasses the range of cognitive activities or processes undertaken by individuals, teams, organizations, and indeed societies to develop situational awareness and understanding in ambiguous situations of high complexity or uncertainty, and to relate this understanding to a feasible action space so that they can identify courses of action available for a potential response, make decisions and act in a principled and informed manner. Sensemaking has to do with fitting together the pieces of the puzzle (information, constructs drawn from prior knowledge and mental models, ambitions, emotions) into a story that conveys an intuitive appreciation of the situation. This story embodies cultural values, and it contains some idea of a dynamic future, and it also may contain an intimation of alternative paths to different futures. Together, the prior knowledge, mental models, and resulting understanding of a situation provide the basis for sensemaking.

Human Computer Interface, Interaction and Visualization: The nature of the work in this area is related to the elaboration of innovative concepts, to the exploration, studying and exploitation of relevant disciplines, techniques and technologies and to the design, developing and evaluating new and enhanced capabilities to support the integrated process of organizing, representing, sharing, visualizing, interacting with, providing insight in and disseminating the information produced during the intelligence cycle. A strong emphasis is on complex and multidimensional information. Enabling technologies include but are not limited to cognitive engineering, information visualization, visual analytics, human-computer interaction, collaborative working technologies, virtual reality and augmented reality, information dissemination, smart-room environments.

Environments and Systems: The nature of the work in this area covers the full spectrum of information system/software development described in Appendix 3. These activities cover what is generally accepted and applied to most projects most of the time, but may also include the results of R&D. They are related to topics such as system/software requirements, design, construction, testing, maintenance, configuration management, software development management, development process, development tools and methods and quality.

2.2.4 T4 – Development, Engineering and Evaluation Program

This Program typically addresses technologies at the mature end of the TRL spectrum: TRL 6-9. The activities to be conducted under T4 are intended to contribute to the full range of DEE initiatives related to 'intelligence analysis'. Tasks identified for T4 will be initiated using a task authorisation process, as and when required.

Table 1 provides a list of typical activities that may be undertaken for FIAC – Spiral 1 under Task T4 while Appendix 1 provides a description of the activities identified in Table 1. Appendix 2 provides details about each category of resources that may be required to perform work within the DEE Program for the development of the FIAC – Spiral 1.

2.3 Deliverables

Typical deliverables that may be produced under this Contract are listed in Table 2.

Table 2 - Typical Deliverables

<p><u>Research / Analysis</u></p> <ul style="list-style-type: none"> • Scientific Report • Technical Report • Scoping Study • Product Review • Model • Written Advice • Technical Specification <p><u>Project Management</u></p> <ul style="list-style-type: none"> • Project Proposal, Project Implementation Plan, Progress Review Report, Meeting Minutes • Project Portal <p><u>Collaboration</u></p> <ul style="list-style-type: none"> • Presentation, Workshop Report, Conference Paper, Trip Report • Blog, Wiki <p><u>Architecture</u></p> <ul style="list-style-type: none"> • Enterprise Architecture Views • Concept of Operations • System-of-System Integration Plan <p><u>Performance Evaluation Infrastructure</u></p> <ul style="list-style-type: none"> • Test-bed Specification • Laboratory Hardware, Software and Network Infrastructure 	<p><u>Domain Analysis</u></p> <ul style="list-style-type: none"> • Analysis Report • Business Model • Human Factor/Cognitive Study • Knowledge Map, Ontology, Knowledge Base • Requirements Specification • Data/Database Model <p><u>System/Software Development</u></p> <ul style="list-style-type: none"> • Mock-Up, Proof-Of-Concept, System/Software Component, System/Subsystem, Prototype, Production System • Architectural Design Specification • Design Document • Program Code and Documentation • Test Plan and Documentation • Installation Plan and Procedure <p><u>System / Software Transition / Exploitation</u></p> <ul style="list-style-type: none"> • System and User Documentation • Certification & Accreditation Documentation • System Configuration • Quad Chart, Fact Sheet, Poster Video • Joint Publication • Concept of Employment <p><u>Quality Assessment / Performance Evaluation</u></p> <ul style="list-style-type: none"> • Metrics, Scenario • Demonstration/Experimentation Plan • Dataset • Modeling and Simulation Report • Demonstration/Experimentation Report
--	---

2.4 Resources

The Contractor must possess expertise in the following domains:

- System Development;
- Management;
- Science & Technology; and
- Military Expertise.

Appendix 2 provides details about each category of resources that may be required to perform work under this Contract.

Annex B – Basis of Payment, provides rates for each category of resources. It also divides the categories of resources according to the following three groups:

Group 1: Core Resources – Each of these key resources may be required during task authorisations where their domains of expertise are considered essential. This Core Team is required to ensure continuity for the duration of the Contract, including Contract option periods. The name of these specific individuals are identified in Annex B, Basis of Payment, to perform the Work and the Contractor must provide the services of those individuals unless the Contractor is unable to do so for reasons beyond its control.

If the Contractor is unable to provide the services of any specific individual identified in the Annex B, it must provide a replacement in accordance with the section entitled “Replacement of Specific Individuals” of the general conditions.

Resources in this group are:

Management and Support, and System and Software Development Resources:

- M.1 - Project Manager, Level 3
- A.2 - Enterprise Architect, Level 3
- A.3 - Systems Architect, Level 3

Science & Technology and Military Expertise Resources:

- S.1 - Sensemaking Specialist, Level 3
- S.7 - HCI and Visualisation Specialist, Level 3
- S.4 - Information/Knowledge Management (IKM) Specialist, Level 3
- S.10 - Cognitive Specialist, Level 3
- E.1 - Intelligence SME, Level 2

Group 2: Regular Use – It is estimated to use these resource categories in this Group on a more or less *regular* basis. However, there is no specific individual identified in Annex B, Basis of Payment.

Group 3: Unpredictable use and/or ad hoc – The resource categories of this Group may be used or not, depending on the particular needs of task authorizations. The Contractor must be able to provide the resources in these categories as needed. There is no specific individual identified in Annex B, Basis of Payment.

2.5 Applicable Documents

FIAC Information Package version 1 containing the following documents:

- Poussart, D. FIAC White Paper, DRDC-Valcartier Memorandum, 2011;
- FIAC Operating Concept, 2011;
- Science Fiction Scenario, 2011;
- NRC Canada Institute for Scientific and Technical Information, Future Intelligence Analysis Capability, January 2011.

- The information technology infrastructure of the ISTIP, March 2013.

The following referenced documents are publicly available:

- Defence S&T Strategy released by the Department of National Defence in December 2006.⁶
- IEEE Standard Glossary of Software Engineering Terminology, Std 610.12-1990(R2002), September 11, 2002.
- IEEE, Guide to the Software Engineering Body of Knowledge (SWEBOK), 2004.
- IEEE Standard for Software Test Documentation, IEEE Std 829-1998.
- IEEE Standard for Software Unit Testing, IEEE Std 1008-1987.
- Project Management Institute (PMI), Project Management Body of Knowledge (PMBOK), 2010.
- SWEBOK, <http://www.computer.org/portal/web/swebok>, accessed January 2011.
- ISO EAI 12207 [12207 - ISO/IEC/IEEE Standard for Systems and Software Engineering - Software Life Cycle Processes](http://standards.ieee.org/findstds/standard/12207-2008.html), <http://standards.ieee.org/findstds/standard/12207-2008.html>, accessed May 2012.

The Crown will provide the Contractor any reference and technical documentation deemed necessary for the conduct of the work and these will be specified in an approved DND 626. The Contractor may request documents at any time during the Contract period and these requests will be evaluated and approved on a case-by-case basis by the Technical Authority. CLASSIFIED material will be available for consultation at DND or other approved facilities.

⁶ Available at <http://www.drdc-rddc.gc.ca/sciences/strat-eng.asp>, accessed June 2012.

3. CONDUCT OF WORK

3.1 Location of Work

There are no restrictions on the location of the work. Bidders are advised that the scientific team of the C2I S&T capability is situated primarily in Quebec City and the client community in Ottawa. The Contractor could be required to conduct work in either of these geographic locations. Although, it is expected that the majority of the work will be conducted at the Contractor facility, some work must be performed at DND facilities – in particular, work to support existing infrastructure, experimentation and work requiring access to CLASSIFIED material. The requirement to conduct work at a DND facility will be specified in a DND 626. The Technical Authority or other authorized government representative shall have access at all times to the work in progress and to premises where any part of the work is being performed off DND premises.

3.2 Language of Work

The Contractor resources must be fluent in English. Ability to communicate in French is considered an asset for work conducted in Quebec City and Ottawa.

3.3 Hours of Work

The majority of the work to be conducted at DND facilities will be performed between 0700 and 1800 hours daily. A workday consists of 7.5 hours and is exclusive of all meals and breaks. Time in excess of 7.5 hours will only be undertaken once authorized by the Technical Authority and will only be charged at the regular rate. In some cases, work may have to be performed outside of above noted working hours to minimize disruption and/or to support experimentation.

3.4 Travel

Travel will be required in support of this requirement - primarily to Quebec City and Ottawa.

3.5 Government Furnished Equipment

If required, the Technical Authority will provide the Contractor access to the I-Lab, the FIAC integration platform and other existing infrastructure at DRDC Valcartier for the duration of this Contract, including Contract option(s). The Contractor may also be provided access to other DND facilities to support studies, requirements analysis and experimentation. The Crown may provide the Contractor additional hardware, Crown-developed software or related artefacts or both, if these are considered relevant by the Technical Authority to the development or experimentation effort. Use of GFE will be coordinated and authorized by the Technical Authority, through the appropriate DND section.

The Technical Authority or authorized DND representative will control the installation of software on DND computers and will also approve the deployment and removal of Contractor equipment to and from DND facilities. If the Contractor identifies the need for additional equipment for his own purposes, it is expected that the Contractor would acquire this equipment, at no cost to Canada. Approval of the Technical Authority is required before any equipment procured outside DND may be brought into DND facilities. Upon completion of this Contract, the Contractor will be required to reconfigure all development platforms and return all COTS, reference material, equipment, software library or artefacts purchased under Contract.

3.6 Publications

Without restricting the range of the clause « **Canada to Own Intellectual Property Rights in Foreground Information** », all manuscripts and/or publication in scientific journals or the like,

abstracts or oral presentations and any other releases that describe portions of the DRDC Contract work or related information, must be submitted and approved by the Director General of DRDC Valcartier for approval of release. In all approved cases, due reference to DND funding must be specified. All reports and review documentation listed in this SOW must be delivered in both hard and soft copy support. The language for all deliverables is English and all reports must be in MS Word format. An abstract and an executive summary must be submitted with each report. The Technical Authority will provide the Contractor with guidelines for preparing an abstract and executive summary. Unless otherwise specified in a DND 626, final deliverables must be provided on electronic media (CD or DVD) along with ten (10) bundled hard copies. An eleventh hard copy must be provided in camera-ready format. Exceptions to these instructions must be approved by the Technical Authority. In order to better identify a point of contact in DND for readers of the Contract report (or reports) provided to DRDC, the Contractor is requested to identify the PWGSC Task Authorisation number under which the work was conducted.

Contractor reports requiring a DRDC document number (e.g., final reports) must be formatted according to DRDC's publication standard. These standards are available through the Task Authorisation's Administrative Contract Authority.

3.7 Documents to Be Provided to the Contractor

The Crown will provide the Contractor any reference and technical documentation deemed necessary for the conduct of the work and these will be specified in an approved DND 626. The Contractor may request documents at any time during the Contract period and these requests will be evaluated and approved on a case-by-case basis by the Technical Authority. CLASSIFIED material will be available for consultation at DND or other approved facilities.

APPENDIX 1

ACTIVITY DESCRIPTION

Project Management	
Provide Project Management Services	<p>This set of activities comprises tasks identified in the PMBOK Guide for project management and corresponding to the following knowledge areas:</p> <ul style="list-style-type: none"> • Project Integration Management • Project Scope Management • Project Time Management • Project Cost Management • Project Quality Management • Project Human Resource Management • Project Communications Management • Project Risk Management • Project Procurement Management
Collaboration	<p>Collaboration is a recursive process where two or more people or organizations work together in an intersection of common goals — for example, an intellectual endeavour that is creative in nature— by sharing knowledge, learning and building consensus (Wikipedia).</p>
Support National Collaboration Initiatives (government, university, industry)	Professional services provided in order to support the work at the national collaboration level.
Support International Collaboration Initiatives (TTCP, NATO, etc.)	Professional services provided in order to support the work at the international collaboration level.
Provide Facilitation Services	It refers to the process of designing and running a successful meeting by helping a group of people understand their common objectives and assist them to plan to achieve them without taking a particular position in the discussion (Wikipedia).
Research	
Conduct Capability Assessment	<p>A Capability, in the system engineering sense, is defined as the ability to execute a specified course of action. A capability may or may not be accompanied by an intention (Wikipedia). The assessment addresses the gap between what meets and does not met the requirements.</p>

Conduct Gap Analysis	Gap analysis is a technique that helps to compare the organisation's actual state with a given target.
Provide State-of-The-Art Study	This study identifies the highest level of research and development on a given topic or scientific field at the present time.
Conduct S & T Trend Analysis	This is an analysis consisting of collecting information and attempting to identify a pattern, or trend, in a given topic or technology. In S&T study, it tends to predict future technology and innovation products.
Design S & T Proof of Concept	A proof of concept is a short and/or incomplete realization of a certain method or idea(s) to demonstrate its feasibility, or a demonstration in principle, whose purpose is to verify that some concept or theory is probably capable of being useful (Wikipedia). This activity aims to develop the design specifications of an idea to demonstrate its feasibility.
Design Proof of Concept Prototype	This activity comprises the necessary tasks to realize a software/physical prototype that is an original type, form, or instance of something serving as a typical example, basis, or standard for other things of the same category (Wikipedia).
Design Mock-ups	This activity produces a scale or full-size model of a design or device, used for teaching, demonstration, evaluating a design, promotion, and other purposes (Wikipedia).
Analysis	
Conduct Feasibility Study	A comprehensive study is undertaken to determine the feasibility of a project. The study is designed to define the economic, technical, organisational and legal viability of a project with a high degree of reliability. It provides a technical analysis and comparison of various technologies or options or solutions to a given problem.
Conduct Technical Study	A comprehensive study undertaken in order to determine the characteristics and technical feasibility of a technology, a solution or an approach.
Analyze Stakeholders Requirements	Requirements analysis includes requirements classification, conceptual modeling, architectural design and requirements allocation, and requirements negotiation (SWEBOK). An analysis and synthesis of diverse requirements is a singular documented need of what a particular product or service should be or perform. It is most commonly used in a formal sense in systems development or software development.
Develop CONOPS	A Concept of Operations (abbreviated CONOPS, CONOPs, or ConOps) is a document describing the characteristics of a proposed system from the viewpoint of an individual who will use that system. It is used to communicate the quantitative and qualitative system characteristics to all stakeholders (Wikipedia).

Develop Scenario	Scenario development is a concise description of an event or series of actions and events.
Develop Metrics	A metric is a measure for quantitatively assessing, controlling or selecting a person, process, event, or institution, along with the procedures to carry out measurements and the procedures for the interpretation of the assessment in the light of previous or comparable assessments (Wikipedia).
Architecture and System Development	
Provide Architecture Services	A system architecture or systems architecture is the conceptual design that defines the structure and/or behaviour of a system (Wikipedia). This activity refers to the assessment of System of Systems Architecture Requirements, and to the design of System of Systems Architecture.
Perform System Engineering	Systems engineering is an interdisciplinary field of engineering that focuses on how complex engineering projects should be designed and managed (Wikipedia).
Perform Software Engineering	Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software, and the study of these approaches; that is, the application of engineering to software (SWEBOK).
Design	The process of defining the architecture, components, interfaces, and other characteristics of a system or component (IEEE Glossary).
Conduct Joint Application Design	Joint Application Design (JAD) is a process used in the prototyping life cycle area of the Dynamic Systems Development Method (DSDM) to collect business requirements while developing new information systems for a company (Wikipedia).
Develop Proof of Concept Prototype	A proof of concept is a short and/or incomplete realization of a certain method or idea(s) to demonstrate its feasibility, or a demonstration in principle, whose purpose is to verify that some concept or theory is probably capable being useful (Wikipedia). This activity comprises the necessary tasks to realize a prototype as an original type, form, or instance of something serving as a typical example, basis, or standard for other things of the same category (Wikipedia).
Develop Software Program and Web Application	Software development is the act of working to produce/create software. This software could be produced for a variety of purposes - the three most common purposes are to meet specific needs of a specific client/business, to meet a perceived need of some set of potential users, or for personal use (e.g. a scientist may write software to automate a mundane task). (Wikipedia).

Implement Software Program and Web Application	The process of translating a design into hardware components, software components, or both (IEEE Glossary).
Integrate the System within an Environment	System integration is the bringing together of the component subsystems into one system and ensuring that the subsystems function (Wikipedia).
Test-bed and Integration Platform Development	
Assess Integration Platform Requirements	The Integration Platform Requirements describe the approach, methods and processes to design, develop, deploy and support a platform.
Assess Test-bed Requirements	Test Requirements are operations, properties, or behavioural characteristics of the software or application under test that must be verified. Software testing consists of the dynamic verification of the behaviour of a program on a finite set of test cases, suitably selected from the usually infinite executions domain, against the expected behaviour (SWEBOK).
Design, Develop and Implement Test-Bed	<p>This refers to the software development process to produce or create software. This software could be produced for a variety of purposes.</p> <p>A test bed is an environment containing the hardware, instrumentation, simulators, software tools, and other support elements needed to conduct a test (IEEE Glossary).</p> <p>A test bed is a platform for experimentation of large development projects. Test beds allow for rigorous, transparent, and replicable testing of scientific theories, computational tools, and new technologies.</p>
Design, Develop and Implement Integration Platform	<p>This refers to the software development process to produce or create software. This software could be produced for a variety of purposes.</p> <p>An Integration Platform is defined as a computer software which integrates different applications and services (Wikipedia).</p>

Configuration Management and System Administration	
Provide Configuration Management Services	<p>Software Configuration Management (SCM) is the discipline of identifying the configuration of software at distinct points in time for the purpose of systematically controlling changes to the configuration and of maintaining the integrity and traceability of the configuration throughout the system life cycle (SWEBOK).</p> <p>Configuration Management is to establish and maintain control over requirements, specifications, configuration definition documentation, and design changes. This activity supports the audit of the functional and physical configuration (INCOSE).</p>
Procure Hardware and Software Components	This activity comprises the necessary tasks to assess the requirements, select and acquire the appropriate hardware and software components.
Technical Support	
Provide Technical Support	Technical support is a range of services providing assistance with technology products such as computers, software, communications, information processing or other electronic or mechanical goods. It includes activities necessary to ensure that an operational system or component fulfills its original requirements and any subsequent modifications to those requirements (IEEE).
Exploitation	
Conduct User Training	This activity provides the trainee with the basic skills needed to effectively use the product and to raise the user's confidence and satisfaction with the product.
Conduct Acceptance Testing	<p>Formal testing conducted to determine whether or not a system satisfies its acceptance criteria and to enable the customer to determine whether or not to accept the system.</p> <p>(wiki.ercim.org/wg/SoftwareEvolution/index.php/Terminology, accessed October 2012)</p>
Deliver System and User Documentation	<p>This activity provides requirements for the structure, content, and format of user documentation--both printed and electronic (IEEE 1063, 2001).</p> <p>Deliver user guides/instruction manuals to enable operational users to use the system. They may include instructions for accessing and using programs, accessing, naming, and saving files, and protocols; for example, for using email, troubleshooting.</p> <p>(11it2010-derme.wikispaces.com/file/view/Official+IT+Glossary.doc, accessed October 2012)</p>

Provide System Administration Services	The necessary services provided to operate and maintain a computer system and/or network.
Provide Product Support	The providing of information, assistance, and training to install and make software operational in its intended environment and to distribute improved capabilities to users (IEEE Glossary).
Provide Exploitation Support	Exploitation support is the set of activities necessary to ensure that an operational system or component fulfills its original requirements and any subsequent modifications to those requirements (IEEE Glossary). For example, software or hardware maintenance, user training.
Subject Matter Expertise	
Provide Expert Advice (specify the type: management, architecture, military, SME support)	An expert task by which the resource develops and presents a proposal for an appropriate course of action. Normally, a proposal would take the form of a written technical note.
Human Factors	
Analyse Human Factors	<p>Human factors science or human factors technologies is a multidisciplinary field incorporating contributions from psychology, engineering, industrial design, statistics, operations research and anthropometry (Wikipedia).</p> <p>Human factors include the cognitive, social and organizational factors that underpin analytical, communication and collaboration capabilities of humans. They include contextual factors such as workload, time pressure, risk and uncertainty.</p> <p>The analysis of such human factors is required to support the selection, training, and development of operators, analysts, and decision makers, and the operation of teams of such personnel.</p>
Conduct Cognitive Work Analysis	Cognitive Work Analysis (CWA) is an approach to the analysis, design, and evaluation of human-computer interactive systems—particularly of complex, high-technology socio-technical systems (Sanderson, P., Computer Human Interaction Conference, 1998. Proceedings. 1998 Australasian, pp. 220 - 227).

Conduct Cognitive System Engineering	Cognitive systems engineering is a specialty discipline of systems development that addresses the design of socio-technical systems. A socio-technical system is one in which humans provide essential functionality related to deciding, planning, collaborating and managing. Drawing on contemporary insights from cognitive, social and organizational psychology, cognitive systems engineers seeks to design systems that are effective and robust. The focus is on amplifying the human capability to perform cognitive work by integrating technical functions with the human cognitive processes they need to support and on making that cognitive work more reliable (Gavan Lintern, Cognitive Systems Engineering, Cognitive Systems Design, Melbourne, Australia, http://www.cognitivesystemsdesign.net/Workshops/Cognitive%20Systems%20Engineering%20Brief.pdf , accessed October 2012).
Experimentation and Demonstration	
Develop Experimentation and Demonstration Plan	The purpose of the plan is to generate high quality data which can be used to verify the performance of a technology, a concept or a system.
Develop Operational Scenario	Operational scenario development is the production of a synthetic description of an event or series of actions and events occurring in the context of organisation operations.
Design and Develop Test Bed Component to Support Experimentation	A test bed is a platform for experimentation of large development projects (Wikipedia). This activity refers to the necessary work to design and develop components forming the test bed.
Develop Data Sets	A data set (or dataset) is a collection of data, usually presented in tabular form. This activity assembles all data pertaining to the conduct of an experiment or survey.
Manage Experimentation	This activity is the set of tasks necessary for the conduct of an experiment in order to investigate the causal relationships among variables, or to test a hypothesis.
Provide Technical Support to Experimentation and Demonstration	This activity is the set of tasks necessary to develop experimentation plans, procedures, and data collection plans in support of experimentation and demonstration, to conduct experimentation and demonstration, and to collect data, analyze, and report results.
Analyse Experimentation Data	This activity comprises the necessary work to conduct the analysis of data produced by an experimental or quasi-experimental design. Depending of the experimentation, experimentation data may be qualitative or quantitative.

Produce Experiment Report	This activity comprises the necessary work to produce a report on the conduct and outcome of the experiment to be submitted to the Scientific Authority.
Support Experimentation and Demonstration Activities	This activity comprises the necessary work to support experiments and demonstration centrally located or distributed over live and/or virtual networks and communication infrastructure.

APPENDIX 2 CATEGORIES OF RESOURCES

1. SYSTEM AND SOFTWARE DEVELOPMENT

This section comprises the resource categories. required to perform comprehensive work in System and Software Development, as described in Appendix 3:

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, DND AF, 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

Level 2 and Level 3	
Technical Specialties	Examples of Technical Solutions
	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
 - 2 to 4 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 modeling.
- 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, DND AF, 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 throughput 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 airborne 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 (Minnesota 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 supervisory 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 perspectives 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 supervisory 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 perspectives 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 (Minnesota 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 feasibility 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 1, Level 2 and Level 3	
Technical Specialties	Examples of Technical Solutions
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
- M.2 - Project Assistant
- M.3 - Project Administrator
- M.4 - Project Leader
- M.5 - Quality Assurance Analyst
- M.6 - Science and Technology Program Manager
- M.7 - Technical Writer
- M.8 - Group Facilitator

2.1 M.1 - Project Manager

Experience Levels

- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience, or 8+ years of experience with a recognized professional certification, e.g., PMI 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 Time 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 at a provincially accredited Project Management Training Institution 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.

2.2 M.2 - Project Assistant

Experience Levels

- Level 1: < 5 years of experience
- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience, or 8+ years of experience with a recognized professional certification, e.g., PMI PMP

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

- Assist the project team in all management activities.
- Coordinate project management activities including financial and planning aspects.

- Provide assistance in the creation of a project management office.
- Give briefings on progress and concerns of project.
- Prepare and coordinate documentation in response to scheduled and unscheduled reports, returns and observations to update management of project progress.
- Coordinate the activities of Contractor project personnel, external customers, contractors and other support providers.
- Assist in the preparation of formal Statement of Work, work breakdown structure and compliance charts.
- Assist in the production of draft plans and sections for incorporation into the Project Implementation Plan or Request for Proposal.
- Assist in the preparation of draft evaluation plans, criteria and evaluation schedules.
- Assist in the development, planning, analysis, evaluation and prioritization of deliverables and requirements.

Minimum Mandatory Qualifications

All Project Assistants must possess, as a minimum:

- Twelve (12) months of demonstrated experience, within thirty-six (36) months of bid closing, directly providing project management support services.

Required specialties may include but are not limited to:

- Microsoft Project, Microsoft Office.

2.3 M.3 - Project Administrator

Experience Levels

- Level 1: < 5 years of experience
- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience, or 8+ years of experience with a recognized professional certification, e.g., PMI PMP

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

- Assist project management and data processing professionals, technical users and end users in coordination and synchronization tasks.
- Provide administrative and technical support of a clerical nature as required to projects.
- Assist in performing such tasks as maintaining project documentation and application/system libraries.
- Act as the first point of contact in a "hot-line" situation by accepting incoming calls, logging calls, attempting to resolve simple problems and following established procedures for more difficult problems.
- Tracks project change requests.
- Maintain and update relevant project information in manual and/or electronic files; project information might include such things as project activity schedule, status reports, correspondence.
- Use computer tools, aids, system control languages on PCs, minis, or mainframes to perform work.

- Communicate with project management and data processing professionals, technical users and end users on administrative matters related to the project.

Required specialties may include but are not limited to:

- Microsoft Project, Microsoft Office.

2.4 M.4 - Project Leader

Experience Levels

- Level 1: < 5 years of experience
- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience, or 8+ years of experience with a recognized professional certification, e.g., PMI PMP

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

- Specify the general requirements of the system, develop broad system alternatives and identify their administrative, economic and technical feasibility and practicality as well as associated policy and organizational change requirements.
- Analyse and evaluate each alternative based on make/buy, impact and cost/benefit considerations, and propose, justify, plan and cost the implementation of the selected alternative.
- Produce overall plan, a detailed plan for the functional analysis phase, and obtain approval of preliminary analysis.
- Plan, direct and control the activities of a system development team within scheduled time and cost parameters.
- Evaluate proposed computer applications to determine technical, operational and economic feasibility.
- Design and test systems to ensure that the objectives of the system are met and that the outputs produced are in accordance with client requirements.
- Monitor the design, implementation and operations start-up of the proposed system against established goals, objectives and milestones.

Required specialties may include but are not limited to:

- Microsoft Project, Microsoft Office.

2.5 M.5 - Quality Assurance Analyst

Experience Levels

- Level 1: < 5 years of experience
- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience

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

- Propose quality standards and quality control methods.
- Perform quality assurance processes.
- Lead development of test plans, test scripts and test data.

- Participate in functional and technical design reviews, perform integration/functional and system testing, and verify test results.
- Identify and document software defects.
- Participate with other project resources to resolve defects.
- Perform regression testing of software applications.

2.6 M.6 -Technical Writer

Experience Levels

- Level 1: < 5 years of experience
- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience

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

- Plan, research and write books, scripts, plays, essays, speeches, manuals, specifications and other non-journalistic articles.
- Analyse material, such as specifications, notes and drawings, and write manuals, user guides and other documents to explain clearly and concisely the installation, operation and maintenance of electronic, mechanical and other equipment.
- Modify, validate and compile technical documents such as technical publications in general, specifications, performance test sheets, equipment and system data lists and drawings.
- Assist and participate in physical and functional configuration audits of systems and equipment.
- Review documents, drawings and associated data for conformance to established standards.
- Document help text, user manuals, technical documentation, web page content, etc.
- Determine documentation requirements and make plans for meeting them.
- Gather information concerning the features and functions provided by the developers.
- Assess the audience for the documents/manuals which are required and prepare a statement of purpose and scope for each.
- Develop a table of contents for documents and manuals and write or edit the required content.
- Investigate the accuracy of the information collected by making direct use of the material being documented.
- Prepare or coordinate the preparation of any required illustrations and diagrams.
- Design the layout of the documents/manuals.
- Use word-processing, desk-top publishing and graphics software packages to produce final camera-ready copy.

2.7 M.7 - Group Facilitator

Experience Levels

- Level 1: < 5 years of experience

- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience

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

- Group Problem Solving and Decision Making.
- Strategic Planning.
- Team Building.
- Participatory Planning.
- Idea Generation/Experiential Learning.
- Large Group Facilitation.
- Training, Mentoring and Coaching.
- Leadership Training.
- Electronic Meeting Support.
- Focus Groups/Discussion Moderation.
- Group Process Consultation.

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.8 - Human-Computer Interaction and Visualisation Analyst
- S.9 - Human-Computer Interaction and Visualisation Lead Developer
- S.10 - Cognitive Specialist
- S.11 - Operations Research Analyst
- S.12 - Operations Research Lead Developer

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 Appendix 3.

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.

Required specialties may include but are not limited to:

- Demonstrated knowledge and expertise of statistics, machine learning, evidence theory, fuzzy logic and controls Intelligent solutions.
- Expertise in several of the following: rule based analyses, critical analyses, modelling and simulation, analysis approaches/techniques/algorithms risk modelling, what-if analysis, robustness analysis, human decision-making modelling.

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 Appendix 3.

Experience Levels

- Level 2: 5- < 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 Appendix 3.

Experience Levels

- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience

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 Appendix 3.

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:

- 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.
- Metadata standards
- Semantic web, web services

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 Appendix 3.

Experience Levels

- Level 2: 5- < 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 Appendix 3.

Experience Levels

- Level 2: 5- < 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

This category is for work required to perform comprehensive analysis in HCI and Visualisation, as described in Appendix 3.

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:

- 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.

Required specialties could include but are not limited to:

- Graphic & Visual design tools, Input / Output devices, Visual Analytics applications, Group Ware, wikimedia, virtual reality software.

3.8 S.8 - Human-Computer Interaction and Visualisation Analyst

This category is for work required to perform comprehensive development in HCI and Visualisation, as described in Appendix 3.

Experience Levels

- Level 2: 5- < 10 years of experience
- Level 3: 10+ years of experience

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

- 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 Human-Computer Interaction (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.

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.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 Appendix 3.

Experience Levels

- Level 2: 5- < 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.

3.10 S.10 - Cognitive Specialist

Cognitive Engineering is an interdisciplinary approach to designing computerized systems intended to support human performance (Roth, Patterson & Mumaw, 2001⁷). It encompasses the

⁷ [Roth, E. M., Patterson, E. S., & Mumaw, R. J. Cognitive Engineering: Issues in User-Centered System Design. In J.J. Marciniak, Ed. Encyclopedia of Software Engineering (2nd Edition). NY: John Wiley and

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 Appendix 3.

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.

Sons, 2001] describes the use of CTA, CWA, ACWA, and computational cognitive modeling in the design of user-centered systems.

Required specialties may include but are not limited to:

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

3.11 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 Appendix 3.

Experience Levels

- Level 2: 5- < 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 specialties may include but are not limited to:

- Expertise in any or all of the following,: resource allocation, resource scheduling, planning, bayesian 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.

3.12 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 Appendix 3.

Experience Levels

- Level 2: 5- < 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.

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: 5+ < 10 years of experience in Intelligence
- Level 3: 10+ years of 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

Experience Levels

- Level 2: 5+ < 10 years of experience in C2 functions
- Level 3: 10+ years of experience in C2 functions

Responsibilities could include but are not limited to:

- Extracting 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.

- Development of representative military scenarios for evaluating C2 in a broad range of operational settings.
- Development of systems and/or processes related to military C2 (CAN-US).
- Planning, design and management of military exercises, wargames and experiments.
- Demonstrated knowledge of 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.

APPENDIX 3 SCIENCE AND TECHNOLOGY EXPERTISE

Information and Knowledge Management

Knowledge Representation – Formalisms

- Information organization: taxonomies, classification, clustering
- Ontologies, semantic networks
- Semantic web technologies
- Rules

Data Management – Data Warehousing

- Standards/STANAGS for information storage & exchange
- Metadata
- Data modeling, military data models, JC3IEDM
- Data storage, conversion
- Large-scale databases
- Multi-sources, multi-dimensional, Data warehouse
- Data integration: framework, architecture
- Mobile data management
- Data mining

Information Management Services

- Search / Information Retrieval
 - Federated search, semantic search, spatial search
- Data/information/knowledge discovery
- Filtering, alert, notification
- Publish- subscribe
- User-centric, context-based IM

Data Quality

- Data assurance, metrics
- Data/information pedigree
- Uncertainty management
- Incompleteness
- Data cleansing

Natural Language Processing

- Text parsing, semantic tagging , annotation
- Text mining
 - Relations - link analysis
- Summarization
- Translation, Multilingual processing
- Text generation

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

- Indexing, annotation
- Extraction, Mining
- Biometric data management & processing

Document / Content management

Collaboration

- Social networking
- Peer-to-Peer
- Portal Technologies, Webs 2 & 3, wiki, chat
- Information sharing – interoperability

Security / Privacy

- Cyber security
- Information protection
- Trust
- Access control (RBAC, ...)

Miscellaneous

- Enterprise Architecture
- Service oriented architecture
- Cloud computing

Human-Computer Interaction and Visualization

Cognitive Engineering

- Cognitive Task/Work/Function Analysis

- Storyboarding

Display Technology

- Large high-resolution displays
- Large group displays
- 3D displays
- Immersive displays
- Organic User Interfaces
- Flexible displays
- Wearable displays, head-mounted displays

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

Intelligent User Interfaces

- Adaptive user interfaces
- Zoomable interfaces, fish-eye views

Visual Analytics

- Trends analysis
- Anomaly detection
- Hypothesis generation

Information Visualization

- Large datasets
- Geo-temporal information
- Networks
- Complex, multi-dimensional and abstract information
- Animation, playback

Mixed Reality

- Immersive / Virtual Reality Environments
- Augmented Reality

Collaborative Working Technologies

- Audio / Video Conferencing/Tele-presence;
- Chat/Instant Messaging
- Electronic White Board
- Program Sharing/Application Sharing
- Groupware, wiki
- Online Bulletin Board
- Virtual worlds

Smart Room Environments

- Intelligent meeting room services
- Sensory / Perceptual systems
- Ubiquitous computing
- Smart spaces
- Simulation
- Multi-modal interaction

Sensemaking

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

Machine Learning

- Neural networks
- Reinforcement Learning
- Supervised Learning
- Unsupervised Learning
- Classifiers and Statistical Learning methods

Artificial Intelligence

- Logic
- Probabilistic Methods for Uncertain Reasoning
- Game Theory
- Control Theory
- Genetic Algorithms
- Natural Language Processing
- Explanation and Justification Systems

Probability and Statistics

Operations Research

Mathematical Modeling

Optimisation

- Combinatorial optimisation
- Mathematical programming
- Dynamic and stochastic programming
- Markov chains
- Heuristics and meta-heuristics
- Constraint satisfaction problems
- Distributed constraint satisfaction problems

Resource Allocation

- Planning models
- Scheduling
- Queuing theory

Multi-Criteria Analysis

- Multi-Criteria Decision Aid Methods
- Fuzzy multi-criteria analysis
- Multi-attribute Utility Functions
- Goal programming
- Analytic Hierarchy Process
- Robustness analysis

Modeling and Simulation

- Discrete event simulation
- Monte Carlo Simulation
- Stochastic simulation

Collaboration and Coordination

- Coordination
- Distributed environments

Graph Theory

- Network modeling
- Network flow
- Shortest path problems
- Assignment problems

Uncertainty

- Neural networks
- Decision trees
- Bayesian networks
- Fuzzy sets and systems

Decision Support

- Decision support systems
- Group decision support systems

System and Software Development

Enterprise Architecture Development

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

Systems Development

- System Architecting
- System Development
- System Integration
- Performance assessment

Business Analysis

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

Software Development

- Software Requirements
- Software Design
- Software Construction
- Software Testing
- Software Maintenance
- System Testing

Software Configuration Management

- Configuration Identification
- Configuration Control
- Release Management

Software Development Management

- Scope Definition
- Software Project Planning
- Software Project Enactment
- Review and Evaluation
- Software Development Management

Software Development Process

- Process Definition and Assessment

Software Development Tools and Methods

- Software Modeling

Software Quality

- Software Quality Management
- Processes

Software Ergonomics

Data Architecture Management

- Enterprise Data Modeling

Data Management Quality

- Analysis
- Specification
- Measurement
- Improvement

Data Development

- Data Modeling
- Analysis
- Database Design
- Implementation

Metadata Management

- Architecture
- Integration
- Control

Data Warehousing

- Architecture
- Implementation

Data governance

Data Security Management

- Administration
- Authentication
- Standards

Distributed Computing

- Architecture
- Implementation
- Maintenance

Mobile Computing

- Architecture
- Implementation
- Maintenance

Pervasive Computing

- Architecture
- Implementation
- Maintenance

System and Software Development

Service-Oriented Architecture

- Architecture
- Implementation
- Maintenance

Data Cloud

- Architecture
- Implementation

Private Cloud Computing

- Architecture
- Implementation
- Maintenance

High Performance Computing

- Architecture
- Implementation
- Maintenance

Virtualization

- Architecture
- Implementation
- Maintenance

Web Development

- Web Application Development

Information Technology Management

APPENDIX 4

TECHNOLOGY READINESS LEVELS

Department of Defense (DoD) issued the directive DoD Instructions 5000.2 that establishes a requirement for Technology Readiness Assessment (TRA) and a TRA Deskbook, which provides the outline of a process for performing these TRAs. The TRA Deskbook introduces nine Technology Readiness Levels (TRLs) as an accepted way to describe the maturity of an available technology.⁸ The original DoD TRL definitions and supporting information were developed primarily for performance-related hardware technologies. A TRA examines program concepts, technology requirements, and demonstrated technology capabilities to determine technological maturity. The TRA determines the readiness level (i.e., TRL) for the Critical Technology Elements (CTEs) being evaluated.

A TRL is a systematic metric/measurement system that supports assessment of the maturity of a particular technology and consistent comparison of maturity between various types of technology. TRL does not discuss the probability of occurrence (i.e., the likelihood of attaining required maturity) nor the impact of not achieving technology maturity. TRL is a measure scale that can be applied in support or in combination to a technological domain (TD). The technique of TRL as an expression of technology maturity was endorsed as an acceptable measure by both U.K. MoD and U.S. DoD.

TRLs follow a scale from 1 (lowest level of readiness: basic principles observed and concept and/or application formulated) to 9 (mature development: actual system completed and proven through mission operational environment). Therefore, a technology assessed at TRL-1 is by definition at the initial level of technology development, i.e., “where scientific research begins to be translated into applied research and development”. By the time the technology has reached a TRL-9, the technology has progressed through formulation of an initial concept for application, proof of concept, demonstration in a laboratory environment and a realistic environment, and integration into a system, and has been “mission qualified” and then “mission proven”. This last state of development, where the technology is operating under mission conditions, is TRL-9. Table 3 provides the description of each level.

For indication, note that many U.S. federal organisations consider TRL-7, “System prototype demonstration in an operational high-fidelity environment”, to be an acceptable risk for starting the engineering and manufacturing development phase.

Table 4 provides the set of software TRL definitions and descriptions developed by DoD specialists and adapted specifically to software rather than to the generic ones provided for hardware and software all together. Although the overall definitions are similar to the TRLs for hardware, the examples and the documentation needed to support the assessment differ.

⁸ Deputy Under Secretary of Defense for Science and Technology, “Technology Readiness Assessment (TRA) Deskbook”, Washington D.C.: DoD, July 2009, <http://akss.dau.mil>, accessed as July 2009.

Table 3 - Technology Readiness Levels in the Department of Defense (DoD)

(Source: DoD (2006), Defense Acquisition Guidebook)

Level Definition	Description
1. Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Example might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.
3. Analytical and experimental critical function and/or characteristic proof of concept	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment	Basic technological components are integrated to establish that the pieces will work together. This is "low fidelity" compared to the eventual system. Examples include integration of 'ad hoc' hardware in a laboratory.
5. Component and/or breadboard validation in relevant environment	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in a simulated environment. Examples include 'high fidelity' laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond the breadboard tested for TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high fidelity laboratory environment or in simulated operational environment.
7. System prototype demonstration in an operational environment	Prototype near or at planned operational system. Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment, such as in an aircraft, vehicle or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and 'flight qualified' through test and demonstration	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system 'flight proven' through successful mission operations	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. In almost all cases, this is the end of the last "bug fixing" aspects of true system development. Examples include using the system under operational mission conditions.

Table 4 - Software-specific definition, description and supporting information of TRL

TRL	Level Definition	Description	Supporting Information
1	Basic principles observed and reported.	Lowest level of software technology readiness. A new software domain is being investigated by the basic research community. This level extends to the development of basic use, basic properties of software architecture, mathematical formulations, and general algorithms.	Basic research activities, research articles, peer-reviewed white papers, point papers, early laboratory-model of basic concept may be useful for substantiating this TRL level.
2	Technology concept and/or application formulated.	Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies using synthetic data.	Applied research activities, analytic studies, small code units, and papers comparing competing technologies.
3	Analytical and experimental critical function and/or characteristic proof of concept.	Active R&D is initiated. The level at which scientific feasibility is demonstrated through analytical and laboratory studies. This level extends to the development of limited functionality environments to validate critical properties and analytical predictions using non integrated software components and partially representative data.	Algorithms run on a surrogate processor in a laboratory environment, operating in laboratory components, laboratory results showing validation of critical properties.
4	Module and/or sub-system validation in a laboratory environment (i.e., software prototype development environment).	Basic software components are integrated to establish that they will work together. They are relatively primitive with regard to efficiency and robustness compared with the eventual system. Architecture development initiated to include interoperability, reliability, maintainability, extensibility, scalability, and security issues. Emulation with current/ legacy elements as appropriate. Prototypes developed to demonstrate different aspects of eventual system.	Advanced technology development, stand-alone prototype solving a synthetic full-scale problem, or standalone prototype processing fully representative data sets.

TRL	Level Definition	Description	Supporting Information
5	Module and/or sub-system validation in a relevant environment.	Level at which software technology is ready to start integration with existing systems. The prototype implementations conform to target environment/interfaces. Experiments with realistic problems. Simulated interfaces to existing systems. System software architecture established. Algorithms run on a processor(s) with characteristics expected in the operational environment.	System architecture diagram around technology element with critical performance requirements is defined. Processor selection analysis, Simulation/ Stimulation (Sim/Stim) Laboratory buildup plan. Software placed under configuration management. Commercial On The Shell/Government On The Shell (COTS/GOTS) in the system software architecture are identified.
6	Module and/or sub-system validation in a relevant end-to-end environment.	Level at which the engineering feasibility of a software technology is demonstrated. This level extends to laboratory prototype implementations on full-scale realistic problems in which the software technology is partially integrated with existing hardware/ software systems.	Results from laboratory testing of a prototype package that is near the desired configuration in performance, including physical, logical, data, and security interfaces. Comparisons between tested environment and operational environment as analytically understood. Analysis and test measurements quantifying contribution to system-wide requirements, such as throughput, scalability, and reliability. Analysis of human-computer interaction (user environment) begun.
7	System prototype demonstration in an operational high-fidelity environment.	Level at which the program feasibility of a software technology is demonstrated. This level extends to operational environment prototype implementations where critical technical risk functionality is available for demonstration and a test in which the software technology is well integrated with operational hardware/ software systems.	Critical technological properties are measured against requirements in a simulated operational environment.
8	Actual system completed and mission qualified through test and demonstration in an operational environment.	Level at which a software technology is fully integrated with operational hardware and software systems. Software development documentation is complete. All functionality tested in simulated and operational scenarios.	Published documentation and product technology refresh build schedule. Software resource reserve measured and tracked.

TRL	Level Definition	Description	Supporting Information
9	Actual system proven through successful mission-proven operational capabilities.	Level at which a software technology is readily repeatable and reusable. The software based on the technology is fully integrated with operational hardware/software systems. All software documentation verified. Successful operational experience. Sustaining software engineering support in place. Actual system.	Production configuration management reports. Technology integrated into a reused "wizard".

LIST OF ACRONYMS

.NET	Microsoft Web services framework
AI	Action Item
C&A	Certification and Accreditation
C2	Command and Control
C2IS	Command and Control Information System
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CA	Contracting Authority
CCIRM	Commander's Critical Information Requirements Management
CDRL	Contract Data Requirement List
CF	Canadian Forces
CFWC	Canadian Forces Warfare Centre
COIN	Counter Insurgency Operations
CONOPS	Concept of Operations
COTS	Commercial off-the-shelf
DB	Data Base
DID	Data Item Description
DND	Department of National Defence
DoD	Department of Defense
DRDC	Defence Research and Development Canada
DRDC-V	Defence Research and Development Canada – Valcartier
DWAN	Defence Wide Area Network
EBA	Effect-Based Approach
EBO	Effects Based Operations
EBP	Effects Based Planning
G2	Army Intelligence
GFE	Government Furnished Equipment
GOTS	Government off-the-shelf
HQ	Headquarter
HW	Hardware
IEEE 12207	Institute of Electrical and Electronics Engineers 12207 – Framework for Developing and Managing Software
IPB	Intelligence Preparation of the Battlespace
IPOE	Intelligence Preparation of the Operating Environment
ISO	International Standard Organisation
IM	Information Management
Int	Intelligence
IT	Information Technology
J2EE	Java 2 Platform Enterprise Edition
MPS	Master Project Schedule
MoD	Ministry of Defence
MOE	Measure of Effectiveness
MOP	Measure of Performance
NATO	North Atlantic Treaty Organization
NGO	Non-Governmental Organizations
NLP	Natural Language Processing
OGC	Open Geospatial Consortium
OGD	Other Government Department
OR	Operations Research
OPI	Office of Primary Interest
OPP	Operational Planning Process
PIP	Project Implementation Plan

PM	Project Manager
PMI	Project Management Institute
PMP	Project Management Professional
PRM	Progress Review Meeting
PYs	Person-Years
RCMP	Royal Canadian Mounted Police
RUP	Rational Unified Process
SA	Scientific Authority
SME	Subject Matter Expert
SOR	Statement of Operational Requirements
SoS	System of Systems
SOW	Statement of Work
SW	Software
TA	Technical Authority
TD	Technology Demonstration
TDP	Technology Demonstration Program
TF	Task Force
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
TTCP	The Technical Cooperation Programme

Development of a Joint Intelligence and Information S&T Capability

ANNEX “E”

Security Requirements Check List



Government of Canada
Gouvernement du Canada

Contract Number / Numéro du contrat

W7701-125076 **AMENDMENT 2**

Security Classification / Classification de sécurité
unclassified

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 R et 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 Development of a Joint Intelligence and Information S&T Capability			
5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?		<input type="checkbox"/> No / Non <input checked="" type="checkbox"/> 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?		<input checked="" type="checkbox"/> No / Non <input type="checkbox"/> 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)		<input type="checkbox"/> No / Non <input checked="" type="checkbox"/> 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.		<input checked="" type="checkbox"/> No / Non <input type="checkbox"/> 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?		<input checked="" type="checkbox"/> No / Non <input type="checkbox"/> 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 <input checked="" type="checkbox"/>		NATO / OTAN <input checked="" type="checkbox"/>	
Foreign / Étranger <input checked="" type="checkbox"/>			
7. b) Release restrictions / Restrictions relatives à la diffusion			
No release restrictions Aucune restriction relative à la diffusion <input checked="" type="checkbox"/>		All NATO countries Tous les pays de l'OTAN <input checked="" type="checkbox"/>	
No release restrictions Aucune restriction relative à la diffusion <input checked="" type="checkbox"/>			
Not releasable À ne pas diffuser <input type="checkbox"/>			
Restricted to: / Limité à: Specify country(ies): / Préciser le(s) pays: <input type="checkbox"/>		Restricted to: / Limité à: Specify country(ies): / Préciser le(s) pays: <input type="checkbox"/>	
Restricted to: / Limité à: Specify country(ies): / Préciser le(s) pays: <input type="checkbox"/>		Restricted to: / Limité à: Specify country(ies): / Préciser le(s) pays: <input type="checkbox"/>	
7. c) Level of information / Niveau d'information			
PROTECTED A PROTÉGÉ A <input checked="" type="checkbox"/>		NATO UNCLASSIFIED NATO NON CLASSIFIÉ <input checked="" type="checkbox"/>	
PROTECTED B PROTÉGÉ B <input checked="" type="checkbox"/>		NATO RESTRICTED NATO DIFFUSION RESTREINTE <input checked="" type="checkbox"/>	
PROTECTED C PROTÉGÉ C <input type="checkbox"/>		NATO CONFIDENTIAL NATO CONFIDENTIEL <input checked="" type="checkbox"/>	
CONFIDENTIAL CONFIDENTIEL <input checked="" type="checkbox"/>		NATO SECRET NATO SECRET <input checked="" type="checkbox"/>	
SECRET SECRET <input checked="" type="checkbox"/>		COSMIC TOP SECRET COSMIC TRÈS SECRET <input type="checkbox"/>	
TOP SECRET TRÈS SECRET <input type="checkbox"/>			
TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>			
		PROTECTED A PROTÉGÉ A <input type="checkbox"/>	
		PROTECTED B PROTÉGÉ B <input type="checkbox"/>	
		PROTECTED C PROTÉGÉ C <input type="checkbox"/>	
		CONFIDENTIAL CONFIDENTIEL <input checked="" type="checkbox"/>	
		SECRET SECRET <input checked="" type="checkbox"/>	
		TOP SECRET TRÈS SECRET <input type="checkbox"/>	
		TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>	



PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?

Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?

☒ No ☐ Yes
Non Oui

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?

Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

☒ No ☐ Yes
Non Oui

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

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> RELIABILITY STATUS
COTE DE FIABILITÉ | <input type="checkbox"/> CONFIDENTIAL
CONFIDENTIEL | <input type="checkbox"/> SECRET
SECRET | <input type="checkbox"/> TOP SECRET
TRÈS SECRET |
| <input type="checkbox"/> TOP SECRET- SIGINT
TRÈS SECRET - SIGINT | <input type="checkbox"/> NATO CONFIDENTIAL
NATO CONFIDENTIEL | <input checked="" type="checkbox"/> NATO SECRET
NATO SECRET | <input type="checkbox"/> COSMIC TOP SECRET
COSMIC TRÈS SECRET |
| <input type="checkbox"/> SITE ACCESS
ACCÈS AUX EMPLACEMENTS | | | |

Special comments:

Commentaires spéciaux :

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?

Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?

☐ No ☒ Yes
Non Oui

If Yes, will unscreened personnel be escorted?

Dans l'affirmative, le personnel en question sera-t-il escorté?

☐ No ☒ Yes
Non Oui

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?

Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

☐ No ☒ Yes
Non Oui

11. b) Will the supplier be required to safeguard COMSEC information or assets?

Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

☒ No ☐ Yes
Non Oui

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?

Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

☒ No ☐ Yes
Non Oui

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?

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?

☒ No ☐ Yes
Non Oui

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency?

Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

☒ No ☐ Yes
Non Oui



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 SECRET	COSMIC TOP SECRET COSMIC TRÈS SECRET	PROTECTED PROTÉGÉ			CONFIDENTIAL CONFIDENTIEL	SECRET	TOP SECRET TRÈS SECRET
											A	B	C			
Information / Assets Renseignements / Biens Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Media / Support TI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT Link / Lien électronique	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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, classifiez 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, classifiez 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).

Development of a Joint Intelligence and Information S&T Capability

ANNEX “F”

DND 626, Task Authorization Form

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
<div>To – À</div>		<div>TO THE CONTRACTOR</div> <div>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.</div> <div>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.</div> <div>À L'ENTREPRENEUR</div> <div>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.</div> <div>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.</div>	
<div>Delivery location – Expédiez à</div>		<div>Date</div> <div>for the Department of National Defence pour le ministère de la Défense nationale</div>	
<div>Contract item no. N° d'article du contrat</div>		Services	Cost Prix
		GST/HST TPS/TVH	
		Total	
<div>APPLICABLE ONLY TO PWGSC CONTRACTS:</div> <div>The Contract Authority signature is required when the total value of the DND 626 exceeds the threshold specified in the contract.</div> <div>NE S'APPLIQUE QU'AUX CONTRATS DE TPSGC :</div> <div>La signature de l'autorité contractante est requise lorsque la valeur totale du formulaire DND 626 est supérieure au seuil précisé dans le contrat.</div>			
<div>for the Department of Public Works and Government Services pour le ministère des Travaux publics et services gouvernementaux</div>			

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 a 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 débiter 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.