Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

**RETURN BIDS TO:**
**RETOURNER LES SOUMISSIONS À:**

**Travaux publics et Services gouvernementaux Canada**
**Place Bonaventure,**
**800 rue de la Gauchetière Ouest**
**Voir aux présentes - See herein**
**Montréal**
**Québec**
**H5A 1L6**

# 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**

Ce besoin comporte des exigences relatives à la sécurité

There are security requirements associated with this requirement.

**Vendor/Firm Name and Address**
**Raison sociale et adresse du fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

Travaux publics et Services gouvernementaux Canada
Place Bonaventure, portail Sud-Oue
800, rue de La Gauchetière Ouest
7e étage, suite 7300
Montréal
Québec
H5A 1L6

| | |
|---|---|
| **Title - Sujet**<br>Flight Operations and Data Manageme | |
| **Solicitation No. - N° de l'invitation**<br>9F044-190433/A | **Date**<br>2020-03-27 |
| **Client Reference No. - N° de référence du client**<br>9F044-190433 | |
| **GETS Reference No. - N° de référence de SEAG**<br>PW-$MTB-255-15700 | |
| **File No. - N° de dossier**<br>MTB-9-42234 (255) | **CCC No./N° CCC - FMS No./N° VME** |
| **Solicitation Closes - L'invitation prend fin**<br>**at - à 02:00 PM**<br>**on - le 2020-05-12** | **Time Zone**<br>**Fuseau horaire**<br>Heure Avancée de l'Est<br>HAE |
| **F.O.B. - F.A.B.**<br>**Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐ | |
| **Address Enquiries to: - Adresser toutes questions à:**<br>Desforges, Julie | **Buyer Id - Id de l'acheteur**<br>mtb255 |
| **Telephone No. - N° de téléphone**<br>(514) 602-8307 ( ) | **FAX No. - N° de FAX**<br>(514) 496-3822 |
| **Destination - of Goods, Services, and Construction:**<br>**Destination - des biens, services et construction:**<br>AGENCE SPATIALE CANADIENNE<br>6767 ROUTE DE L AEROPORT<br>Utilisation de l'espace<br>ST HUBERT<br>Québec<br>J3Y8Y9<br>Canada | |

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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

Canada

# Table of content

## PART 1 - GENERAL INFORMATION

### 1.1 Introduction

The bid solicitation 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;

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, and the basis of selection;

Part 5 Certifications and Additional Information: includes the certifications and additional information 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 the Statement of Work, the Basis of Payment, Security Requirements, the Security Requirements Checklist, the Electronic Payment Instruments, the Federal Contractors Program for Employment Equity - Certification, the Insurance Requirements, the Task Authorization Form and any other annexes.

### 1.2 Summary

**Project Title**
Satellite Flight Operations and Data Management Services.

**Description**
Every day, Canadian and international satellites meet the needs of users, in Canada and around the world. From space, they provide information and services to support Earth Observation, maritime surveillance, space surveillance, ecosystems monitoring, environmental monitoring, natural disaster management, the national economy, security and defense, and health.

Public Works and Government Services Canada (PWGSC), on behalf of the Canadian Space Agency (CSA), is looking to put in place a contract for the provision of Satellite Flight Operations and Data Management Services, including spacecraft health monitoring and control, operational analysis, basic system maintenance, data order handing, image quality control and data processing and archiving for the satellite missions under its responsibility and operated at the Multi-Mission Control Center (MCC) of the Canadian Space Agency (CSA). Missions potentially addressed in the work include, but are not limited to, SCISAT, NEOSSat, M3MSat and RADARSAT Constellation Mission (RCM), assuming all are operating at the start of the Contract. In addition, the Government of Canada RADARSAT Data Services, which covers Government part of data management (order handling) for the RADARSAT-2 mission, is also covered.

The work will consist of mandatory Services captured in a Statement of Work (SOW) [ANNEX A], that the Contractor must fulfill subject to a Firm-Fixed Price (FFP) process as well as incentives based on Key Performance Indicators (KPIs) described in .a Service-Level Agreement (SLA) [ANNEX E]. This SLA will define Service Levels of the work based on unified Performance Indicators (PIs) that will be used to capture the end-to-end service provision and apply standardized processes and performance targets. From these PIs, few have been selected as KPI. The Contractor will be expected to deliver, monitor and control the Key Performance Indicators as agreed in the SLA.

In addition to the fixed services, there may be additional work required and requested to be performed by the Contractor through a Task Authorization process to cover for other activities such as new mission planning, continuous improvement activities, basic ground and flight software maintenance, hardware repair and build activity, and support to foreign space agencies' launches and satellite operations.

CSA will provide access to Government Furnished Equipment/Services (GFE) in terms of the operational system and its constituent elements. Some of these items are part of the CSA generic infrastructure and others are supplied specifically for each mission undertaken. These tools will be provided as-is and in a condition suitable to be used for Operations. The Contractor will work with experts from the CSA, Shared Services Canada, Natural Resources Canada, and others in the usage of this infrastructure to deliver on all mission objectives. The major portion of the work is expected to be conducted within the CSA premises. Security requirements and non-disclosure agreements will be required.

To ensure continuity of operations and knowledge transfer, the CSA will also provide Government Furnished Personnel (GFP) to be embedded within the Contractor team in order to:

- Maintain efficient communication and collaboration between parties,
- Ensure a level of knowledge retention and transfer within the Government, and
- Maintain the Government's expertise in operations by offering government employees relevant Satellite operations experience.

**Period of Contract**
It is intended to result in the award of one contract for 3 years plus 2 one-year irrevocable options allowing Canada to extend the term of the contract.

### 1.2.1 Security Requirements

There are security requirements associated with this requirement. For additional information, consult Part 6 - Security, Financial and Other Requirements, and Part 7 - Resulting Contract Clauses. For more information on personnel and organization security screening or security clauses, Bidders should refer to the Contract Security Program of Public Works and Government Services Canada (http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) website.

### 1.2.2 Trade agreements

The requirement is subject to the provisions of the Canada-European Union Comprehensive Economic and Trade Agreement (CETA).

### 1.2.3 Controlled Goods

This procurement is subject to the Controlled Goods Program. The Defence production Act defines Canadian Controlled Goods as certain goods listed in Canada's Export Control List, a regulation made pursuant to the Export and Import Permits Act (EIPA).

### 1.2.4 Optional Site Visit

There is an optional site visit associated with this requirement which requires security requirements.

### 1.2.5 Federal Contractors Program

The Federal Contractors Program (FCP) for employment equity applies to this procurement; refer to Part 5 – Certifications and Additional Information, Part 7 - Resulting Contract Clauses and the annex titled Federal Contractors Program for Employment Equity – Certification.

### 1.2.6 Epost Connect

This bid solicitation allows bidders to use the epost Connect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.

### 1.2.7 Confidentiality of Contract documents

A “Non-Disclosure Agreement Contract” must be signed and sent to the Contracting Authority before having access to information by or on behalf of Canada in connection with the Work (refer to Annex H and Section 7.2.3 of this RFP).

### 1.2.8 Confidentiality of the Request for Proposal documents

The “Mandatory Non-Disclosure Agreement (NDA) for Satellite Flight Operations and Data Management Services” must be signed and sent to the Contracting Authority before having access to the optional reference documents (refer to Annex D). The consultation of these reference documents is optional to provide a proposal.

The Contractor requiring access to the reference documents, must hold a valid contractor/personnel security screening at the level of **SECRET**, granted or approved by the CSP, PWGSC.

## 1.3 Debriefings

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 from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

## 1.4 Communications

As a courtesy and in order to coordinate any public announcements pertaining to this contract, the Government of Canada requests that successful Bidders notify the Contracting Authority **10 days** in advance of their intention to make public an announcement related to the recommendation of a contract award, or any information related to the contract. The Government of Canada retains the right to make primary contract announcements.

## PART 2 - BIDDER INSTRUCTIONS

### 2.1 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.

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 (2019-03-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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

Delete: 60 days
Insert: 240 days

### 2.2 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:

**Public Works and Government Services Canada Quebec Region,**
**Place Bonaventure, 7th Floor**
**800 de la Gauchetiere Street West South West**
**Portal, Suite 7300 Montreal (QC), H5A 1L6**

**Bids may also be submitted using the epost Connect service as detailed in the Standard Instructions 2003.**

The following PWGSC Regional Bid Receiving Unit e-mail address is to be used for epost Connect services:

TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca

**Note: Bids will not be accepted if emailed directly to this e-mail address. This e-mail address is to initiate an epost Connect conversation, as detailed in the Standard Instructions 2003, or to send bids through an epost Connect message if the bidder is using its own licensing agreement for epost Connect.**

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

### 2.3 Former Public Servant

Contracts awarded to 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 awarded to FPSs, bidders must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of bids is completed, Canada will inform the

Bidder of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the bid non-responsive.

**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. A former public servant may be:

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 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**

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes** ( ) **No** ( )

If so, the Bidder must provide the following information, for all FPSs in receipt of a pension, as applicable:

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

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

**Work Force Adjustment Directive**

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **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 adjustment 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 Applicable Taxes.

### 2.4 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than **10 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 question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

### 2.5 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.

### 2.6 Improvement of Requirement during Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least **10 days** before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

### 2.7 Optional Site Visit

An optional visit on the work site is planned for May 4th, 2020 at the Canadian Space Agency. It is recommended that the Bidder or a representative of the Bidder visit the work site. However, because of the current COVID-19 situation, the visit may be cancelled or rescheduled. A confirmation will be transmitted during the posting period based on the progress of the situation. The site visit would begin at 9:30 EST, at 6767 route de l’Aéroport, Longueuil (Quebec) J3Y 8Y9.

Personnel security screening is required prior to gaining authorized access to the sites by providing the following information to ASC.ServicedeSecurite-SecurityService.CSA@canada.ca:

- Full Name

- Birth Date
- Country of Origin
- Passport Number

**Plan 2 weeks for processing.**

The Bidder's Company Security Officer (CSO) must ensure that their representative(s) hold a valid security clearance at the required level for the site visit. Failure to comply with the security requirements will result in the representative(s) being denied access to the site.

Bidders must communicate with the Contracting Authority no later than **one week** prior to confirm attendance and provide the name(s) of the person(s) holding a valid security clearance at the required level, who will attend. Bidders who do not confirm attendance and who do not provide the name(s) of the person(s) who will attend as required will not be allowed access to the site. Bidders will be requested to sign an attendance sheet. No alternative appointment will be given to bidders who do not attend or do not send a representative. Bidders who do not participate in the visit will not be precluded from submitting a bid. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation.

## PART 3 - BID PREPARATION INSTRUCTIONS

### 3.1 Bid Preparation Instructions

**If the Bidder chooses to submit its bid electronically**, Canada requests that the Bidder submits bid in accordance with section 08 of the 2003 standard instructions. The epost Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

The bid must be gathered per section and separated as follows:

**Section I:** Technical Bid
**Section II:** Financial Bid
**Section III:** Certifications
**Section IV:** Additional Information

**If the Bidder chooses to submit its bid in hard copies**, Canada requests that the Bidder submits its bid in separately bound sections as follows:

**Section I:** Technical Bid (1 hard copy and 1 soft copy on CD, DVD or USB key)
**Section II:** Financial Bid (1 hard copy and 1 soft copy on CD, DVD or USB key)
**Section III:** Certifications (1 hard copy and 1 soft copy on CD, DVD or USB key)
**Section IV:** Additional Information (1 hard copy and 1 soft copy on CD, DVD or USB key)

If there is a discrepancy between the wording of the soft copy on electronic media and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

**If the Bidder is simultaneously providing copies of its bid using multiple acceptable delivery methods** (electronically and hard copies), and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through epost Connect service, the wording of the electronic copy provided through epost Connect service will have priority over the wording of the other copies.

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

Canada requests that bidders follow the format instructions described below in the preparation of hard copy 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.

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 (https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573). To assist Canada in reaching its objectives, bidders should:

1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and

2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

**Section I: Technical Bid**

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach 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.

To maintain the integrity of the evaluation, evaluators will consider only information presented in the bid. No information will be inferred and personal knowledge or beliefs will not be utilized in the assessment.

Please note: Website references, relevant technical papers, product samples, videotapes, slides, or other ancillary items will not be considered during the evaluation process.

The attachment 1 to Part 3: Bid Preparation Instructions for Satellite Flight Operations and Data Management Services contains additional instructions that Bidders have to follow while preparing their technical bid.

The Attachment 1 to Part 4: Evaluation Procedures and Basis of Selection, contains additional instructions that Bidders should consider when preparing their technical bid.

**Section II: Financial Bid**

**3.1.1** Bidders must submit their financial bid in accordance with the Basis of Payment in Annex "B" and Attachment 1 to Part 3: Bid Preparation Instructions for Satellite Flight Operations and Data Management Services.

**3.1.2 Electronic Payment of Invoices – Bid**

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Attachment 2 to Part 3: Electronic Payment Instruments, to identify which ones are accepted.

If Attachment 2 to Part 3: Electronic Payment Instruments, is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

### 3.1.3 Exchange Rate Fluctuation

C3011T (2013-11-06), Exchange Rate Fluctuation

### 3.1.4 Price Breakdown

Bidders are requested to detail the following elements for the performance of each task, milestone or phase of the Work, broken down per WPD listed in the Statement of Work (SOW Section 4- Description of Work):

(a) Labour: For each individual and (or) labour category to be assigned to the Work, indicate:
i) the hourly rate, inclusive of overhead and profit; and
ii) the estimated number of hours.

(b) Travel and Living Expenses:
Refer to Annex A – Statement of Work, Section 6.3.1 Work Location
The cost, destination and purpose of each journey, together with the basis of these costs which must not exceed the limits of the National Joint Council (NJC). With respect to the NJC's Directive, only the meal and private vehicle specified in Appendices B, C and D of the Directive **http://www.njc-cnm.gc.ca/directive/travelvoyage/index-eng.php ,** and the other provisions of the Directive referring to "travellers", rather than those referring to "employees", are applicable.

The Treasury Board Secretariat's Special Travel Authorities, also apply:
**http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/tbm_113/statb-eng.asp**

(c) Subcontracts: Identify any proposed subcontractor and provide for each one the same price breakdown information as contained in this article.

(d) Applicable Taxes: Identify any Applicable Taxes separately.

## Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.

## Section IV: Additional Information

### 3.1.5 Bidder's Proposed Sites or Premises Requiring Safeguarding Measures

**3.1.5.1** As indicated in Part 6 under Security Requirements, the Bidder must provide the full addresses of the Bidder's and proposed individuals' sites or premises for which safeguarding measures are required for Work Performance:

Street Number / Street Name, Unit / Suite / Apartment Number
City, Province, Territory / State
Postal Code / Zip Code
Country

**3.1.5.2** The Company Security Officer must ensure through the Contract Security Program that the Bidder and proposed individuals hold a valid security clearance at the required level, as indicated in Part 6 – Security, Financial and Other Requirements.

## PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

### 4.1 Evaluation Procedures

(a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical evaluation criteria.

(b) An evaluation team composed of representatives of Canada will evaluate the bids.

In addition to any other time periods established in the bid solicitation:

(i) **Requests for Clarifications:** 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.

### 4.1.1 Technical Evaluation

#### 4.1.1.1 Mandatory and Point Rated Technical Criteria

The Mandatory and Point Rated Technical Criteria are described at Attachment 1 to Part 4: *Evaluation Procedures and Basis of Selection for Satellite Flight Operations and Data Management Services*. Criteria not addressed will be given a score of zero.

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

(ii) The mandatory technical criteria are described in Attachment

(iii) 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.

(iv) The rated requirements are described in Attachment

### 4.1.2 Financial Evaluation

The financial evaluation will be conducted by calculating the Total Bid Price using the Pricing Tables completed by the bidders.

#### 4.1.2.1 Mandatory Financial Criteria

*SACC Manual* Clause A0220T (2014-06-26), Evaluation of Price, Bid

#### 4.1.2.2 Price of Proposal

Refer to instructions contained if Attachment 1 to Part 3, *Section 2-Financial* bid preparation instructions.

### 4.2 Basis of Selection

#### 4.2.1 Basis of Selection - Highest Combined Rating of Technical Merit and Price

1. To be declared responsive, a bid must:
   a. comply with all the requirements of the bid solicitation; and
   b. meet all mandatory criteria; and
   c. obtain the required minimum of **30** points overall for the technical evaluation criteria which are subject to point rating. The rating is performed on a scale of **60** points and;
   d. obtain the required minimum points as follows:
      - 5 points for the criteria: P-1-Corporate Profile and Experience in providing Satellite Flight Operations and Data Management Services;
      - 6 points for the criteria: P-2-Team Experience with Satellite Operations, Ground Systems and Data Systems;
      - 8 points for the criteria: P-3 Understanding and Implementation Approach.
2. Bids not meeting (a) or (b) or (c) or (d) will be declared non-responsive.
3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 60 % for the technical merit and 40 % for the price.
4. To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 60%.
5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 40 %.
6. For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
7. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.
8. In the event the highest number of points for two or more bidders is identical, the contract will be awarded to the bidders with the lowest price proposals calculated in the Attachment 1 to Part 3-Bid Preparation Instructions for Satellite Flight Operations and Data Management Services, Section 2-Financial Bid Instructions.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 60/40 ratio of technical merit and price, respectively. The total available points equals 135 and the lowest evaluated price is $45,000 (45).

**Basis of Selection - Highest Combined Rating Technical Merit (60%) and Price (40%)**

| | | Bidder 1 | Bidder 2 | Bidder 3 |
|---|---|---|---|---|
| **Overall Technical Score** | | 115/135 | 89/135 | 92/135 |
| **Bid Evaluated Price** | | $55,000.00 | $50,000.00 | $45,000.00 |
| **Calculations** | **Technical Merit Score** | 115/135 x 60 = 51.11 | 89/135 x 60 =39.56 | 92/135 x 60 = 40.89 |
| | **Pricing Score** | 45/55 x 40 = 32.73 | 45/50 x 40 = 36.00 | 45/45 x 40 = 40.00 |
| **Combined Rating** | | 83.84 | 75.56 | 80.89 |
| **Overall Rating** | | 1st | 3rd | 2nd |

## PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

### 5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

#### 5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the Forms for the Integrity Regime website (http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html), to be given further consideration in the procurement process.

### 5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame specified will render the bid non-responsive.

#### 5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

#### 5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the “FCP Limited Eligibility to Bid list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the “FCP Limited Eligibility to Bid” list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex titled Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

#### 5.2.3 Additional Certifications Precedent to Contract Award

##### 5.2.3.1 Status and Availability of Resources

*SACC Manual* clause A3005T (2010-08-16) Status and Availability of Resources

##### 5.2.3.2 Education and Experience

*SACC Manual* clause A3010T (2010-08-16) Education and Experience

##### 5.2.3.3 Language Capability

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

#### 5.2.3.4 List of Proposed Subcontractors

If the bid includes the use of subcontractors, the Bidder must provide a list of all subcontractors including a description of the things to be purchased, a description of the work to be performed and the location of the performance of that work. The list should not include the purchase of off-the-shelf items, software and such standard articles and materials as are ordinarily produced by manufacturers in the normal course of business, or the provision of such incidental services as might ordinarily be subcontracted in performing the Work

The Bidder must provide, for each subcontractor, the following:

a) The name of the subcontractor: complete name of its legal entity and place of incorporation;
b) The subcontractor contact: name, title, telephone, fax numbers and email address;
c) A description of the roles and responsibilities of the subcontractor and/or material to be purchased from that subcontractor;
d) A document signed by the subcontractor indicating its agreement to undertake the work as described in the Bidder's proposal.

## PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

### 6.1 Security Requirements

1. At the date of bid closing, 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 sites must meet the security requirements 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 and document safeguarding must meet the security requirements as indicated in Part 7 - Resulting Contract Clauses;

   (e) the Bidder must provide the addresses of proposed sites or premises of work performance and document safeguarding as indicated in Part 3 - Section IV Additional Information.

2. For additional information on security requirements, Bidders should refer to the Contract Security Program of Public Works and Government Services Canada (http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) website.

### 6.2 Financial Capability

*SACC Manual* clause A9033T (2012-07-16), Financial Capability

### 6.3 Controlled Goods Requirement

*SACC Manual* clause A9130T (2019-11-28), Controlled Goods Program

### 6.4 Insurance - No Specific Requirement

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

## PART 7 - RESULTING CONTRACT CLAUSES

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

### 7.1 Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex "A" and the Contractor's technical bid entitled _____ , dated (*to be inserted at contract award*), which has been incorporated with the Statement of Work as an Addendum.

#### 7.1.1 Task Authorization

The Work or a portion of 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.

##### 7.1.1.1 Task Authorization Process

**Portion of the Work - Task Authorizations**

The Task Authorization portion of the Work (refer to Annex A: Statement of Work under Section 5 Description of Services through Task Authorization (TA)) 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.

1. The Technical Authority will provide the Contractor with a description of the task using the "Task Authorization Form" specified in Annex G.
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 and methods of payment as specified in the Contract.
3. The Contractor must provide the Technical Authority, within 1 calendar day for operational emergencies and 5 calendar days for regular operations, 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 Project 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.

#### 7.1.1.2 Task Authorization Limit

The Project Authority may authorize individual task authorizations up to a limit of **$100,000.00**, Applicable Taxes included, inclusive of any revisions.

Any task authorization to be issued in excess of that limit must be authorized by the Project Authority and Contracting Authority before issuance.

#### 7.1.1.3 Canada's Obligation - Portion of the Work - Task Authorizations

Canada's obligation with respect to the portion of the Work under the Contract that is performed through task authorizations is limited to the total amount of the actual tasks performed by the Contractor.

#### 7.1.1.4 Periodic Usage Reports - Contracts with Task Authorizations

The Contractor must compile and maintain records on its provision of services to the federal government under authorized Task Authorizations issued under the Contract.

The Contractor must provide this data in accordance with the reporting requirements detailed below. If some data is not available, the reason must be indicated. If services are not provided during a given period, the Contractor must still provide a "nil" report.

The data must be submitted on a quarterly basis to the Contracting Authority.

The quarterly periods are defined as follows:

1st quarter: April 1 to June 30;
2nd quarter: July 1 to September 30;
3rd quarter: October 1 to December 31; and
4th quarter: January 1 to March 31.

The data must be submitted to the Contracting Authority no later than 15 calendar days after the end of the reporting period.

**Reporting Requirement - Details**

A detailed and current record of all authorized tasks must be kept for each contract with a task authorization process. This record must contain:

**For each authorized task:**

i. the authorized task number or task revision number(s);
ii. a title or a brief description of each authorized task;
iii. the total estimated cost specified in the authorized Task Authorization (TA) of each task, exclusive of Applicable Taxes;
iv. the total amount, exclusive of Applicable Taxes, expended to date against each authorized task;
v. the start and completion date for each authorized task; and
vi. the active status of each authorized task, as applicable.

**For all authorized tasks:**

i. the amount (exclusive of Applicable Taxes) specified in the contract (as last amended, as applicable) as Canada's total liability to the contractor for all authorized TAs; and
ii. the total amount, exclusive of Applicable Taxes, expended to date against all authorized TAs.

### 7.2 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.

#### 7.2.1 General Conditions

2035 (2018-06-21), General Conditions - Higher Complexity - Services, apply to and form part of the Contract.

#### 7.2.2 Supplemental General Conditions

The following Supplemental General Conditions apply to and form part of the Contract:

4001 (2015-04-01), Hardware Purchase, Lease and Maintenance;
4002 (2010-08-16), Software Development or Modification Services;
4003 (2010-08-16), Licensed Software;
4004 (2013-04-25), Maintenance and Support Services for Licensed Software.

#### 7.2.3 Non-disclosure agreement

The Contractor must obtain from its employee(s) or subcontractor(s) the completed and signed non-disclosure agreement, attached at Annex H, and provide it to the Project Authority before they are given access to information by or on behalf of Canada in connection with the Work.

### 7.3 Security Requirements

**7.3.1** The following security requirements (SRCL and related clauses provided by the Contract Security Program) apply and form part of the Contract.

**SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:**
**PWGSC FILE N°9F044-190433**

1. The Contractor must, at all times during the performance of the Contract, hold a valid Facility Security Clearance (FSC) at the level of **SECRET** with approved *Document Safeguarding Capability* (DSC) at the level of **PROTECTED B** issued by the Contract Security Program (CSP), at Public Works and Government Services Canada (PWGSC).

2. This Contract includes access to *controlled goods*. Prior to access, the Contractor must be registered in the Controlled Goods Program of PWGSC.

3. The Contractor personnel requiring access to CLASSIFIED and/or PROTECTED information, assets or sensitive site(s) must EACH hold a valid personnel security screening at the level of **SECRET *or* RELIABILITY STATUS**, *as required,* granted or approved by the CSP, PWGSC.

4. The Contractor MUST NOT utilize its Information Technology systems to electronically process, produce or store any sensitive CLASSIFIED and/or PROTECTED information until the CSP, PWGSC has issued written approval. After approval has been granted, these tasks may be performed at the level of **PROTECTED B**.

5. Subcontracts, which contain security requirements, are NOT to be awarded without the prior written permission of the CSP, PWGSC.

6. The Contractor must comply with the provisions of the:

   a) *Security Requirements Check List* and Security Guide (if applicable), attached at Annex C;

   b) *Industrial Security Manual* (Latest Edition).

**NOTE [1]:** There are **multiple levels of personnel security screenings** associated with this file. In this instance, a *Security Classification Guide (Annex C-1)* must be added to the SRCL clarifying these screenings. The Security Classification Guide is normally generated by the organization's Project Authority and/or Security Authority.

### 7.3.2 Contractor's Sites or Premises Requiring Safeguarding Measures

**7.3.2.1** Where safeguarding measures are required in the performance of the Work, the Contractor must diligently maintain up-to-date the information related to the Contractor's and proposed individuals' sites or premises for the following addresses:

Street Number / Street Name, Unit / Suite / Apartment Number
City, Province, Territory / State
Postal Code / Zip Code
Country

**7.3.2.2** The Company Security Officer must ensure through the Contract Security Program that the Contractor and individuals hold a valid security clearance at the required level.

## 7.4 Term of Contract

### 7.4.1 Period of the Contract

The period of the Contract is from award contract date to 3 firm years.

### 7.4.2 Option to Extend the Contract

The Contractor grants to Canada the irrevocable option to extend the term of the Contract by up to two (2) additional one (1) year periods under the same conditions. The Contractor agrees that, during the extended period of the Contract, it will be paid in accordance with the applicable provisions as set out in the Basis of Payment.

Canada may exercise this option at any time by sending a written notice to the Contractor at least fifteen (15) calendar days before the expiry date of the Contract. The option may only be exercised by the Contracting Authority, and will be evidenced for administrative purposes only, through a contract amendment.

## 7.5 Authorities

### 7.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Julie Desforges
Title: Supply Specialist
Public Works and Government Services Canada
Directorate: Acquisition Branch
Address: Place Bonaventure, Portal South-West

800, rue de La Gauchetière West, 7th floor
Montreal, Quebec H5A 1L6

Telephone: 514-602-8307
Facsimile: 514-496-3822
E-mail address: julie.desforges@tpsgc-pwgsc.gc.ca

The Contracting Authority are 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.

### 7.5.2 Project Authority

The Project Authority for the Contract is: *(will be determined at contract award)*

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone: ___-___-_____
Facsimile: ___-___-_____
E-mail address: _____

The Project Authority named above 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 evaluation, recommendations and approvals of Progress claims, Schedule or Cost and Acceptance of the deliverable items of the Work under this Contract. Such Progress claim, scheduling, cost or acceptance of deliverables matters may be discussed with the Project Authority, however the Project Authority has no capacity 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.

### 7.5.3 Technical Authority:

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone: ___-___-_____
Facsimile: ___-___-_____
E-mail address: _____

The Technical Authority named above 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.

### 7.5.4 Contractor's Representative

Name: _____
Title: _____

Telephone: _____
E-mail address: _____

### 7.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a *Public Service Superannuation Act* (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2012-2 of the Treasury Board Secretariat of Canada.

### 7.7 Payment

### 7.7.1 Basis of Payment - Firm Lot Price(s)

For the Work described in the statement of work of the in Annex A, excluding Section 5: Description of Services through Task Authorization (TA):

In consideration of the Contractor satisfactorily completing its obligations under the Contract, the Contractor will be paid a firm lot price(s) for a cost of $_____ (*insert the amount at contract award*). Customs duties are included and Applicable Taxes are extra.

For the firm price portion of the Work only, 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.

### 7.7.2 Basis of Payment - Task Authorization

The following type of basis of payment will form part of the approved Task Authorization (TA). The task price must be determined in accordance with the Basis of Payment at Annex B.

#### 7.7.2.1 Basis of Payment - Individual task authorizations

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 Applicable Taxes are extra.

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.

**(i) Professional Services provided under a Task Authorization with a Maximum Price:**

For professional services requested by Canada, in accordance with a validly issued Task Authorization, Canada will pay the Contractor, in arrears, up to the Maximum Price for the TA, for actual time worked and any resulting deliverables in accordance with the firm all- inclusive per hourly rates set out in Annex B, Basis of Payment, Applicable Taxes extra.

**(ii) Travel and Living Expenses – National Joint Council Travel Directive**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices B, C and D of the *National Joint Council 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. All payments are subject to government audit.

**(iii) 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.

**7.7.2.2 Limitation of Expenditure - Cumulative Total of all Task Authorizations (Annex A, Section 5: Description of Services through Task Authorization (TA) and Section 7: Contractual Framework Requirements)**

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 $ _____ . Customs duties are included and Applicable Taxes are extra.

2. No increase in the total liability of Canada will be authorized or paid to the Contractor unless an increase has been approved, in writing, by the Contracting Authority.

3. 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.

4. 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.

**7.7.3 Total Estimated Contract Price: $ _____(*to be completed at contract award)***

**7.8 Method of Payment**

**7.8.1 Method of Payment- Milestone Payments (Annex A, Section 4 - Description of Mandatory Work)**

1. Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract, up to 90 percent of the amount claimed and approved by Canada if:

   a. 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;

b. the total amount for all milestone payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;

c. all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;

d. all work associated with the milestone and as applicable any deliverable required have been completed and accepted by Canada.

2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of the item if the Work has been accepted by Canada and a final claim for the payment is submitted

#### 7.8.1.1 Schedule of Milestones

The schedule of milestones for which payments will be made in accordance with the Contract is detailed in Annex B.

### 7.8.2 Method of Payment - Task Authorizations (Annex A, Section 5 Description of Services through Task Authorization (TA))

1. Canada will make progress payments in accordance with the payment provisions of the Contract, no more than once a month, for cost incurred in the performance of the Work, up to 90 percent of the amount claimed and approved by Canada if:

   a. 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;

   b. the amount claimed is in accordance with the basis of payment;

   c. the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;

   d. all certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives.

2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of the item if the Work has been accepted by Canada and a final claim for the payment is submitted

3. Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the rights 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.

## 7.9 SACC Manual Clause

A9117C (2007-11-30), T1204 - Direct Request by Customer Department

### 7.10 Electronic Payment of Invoices – Contract

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

a. Visa Acquisition Card;
b. MasterCard Acquisition Card;
c. Direct Deposit (Domestic and International);
d. Electronic Data Interchange (EDI);
e. Wire Transfer (International Only);
f. Large Value Transfer System (LVTS) (Over $25M)

### 7.11 Time Verification

SACC Manual clause C0711C (2008-05-12), Time Verification

### 7.12 Invoicing Instructions

**Milestone Payments – Not subject to holdback** (Annex B, A - Basis of payment, schedule of milestones)

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and 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 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.

d. the claim includes a cost breakdown for all phases, per Domain and Mission, as detailed in Table 1 of Attachment 1 To Part 3 Bid Preparation Instructions for Flight Operations And Data Management Services.

**Task Authorization Payments - Progress Payment Claim** (Annex b, basis of payment - task authorization)

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

   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 Milestone or Task Authorization Request (TAR) number;

   (d) a list of all expenses, in accordance with the TAR;

   (e) a copy of time sheets to support the time claimed;

   (f) a copy of the release document and any other documents as specified in the contract;

   (g) a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses. For travel and living, expense support must be grouped by trip and submitted only when all receipts for a particular trip are submitted together on a particular claim. CSA approval for

each trip must be included. Original receipts are required, credit card receipts or travel agent itineraries are not acceptable.

(h) a copy of the monthly progress report.

2. Applicable Taxes 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 Applicable Taxes payable as it was claimed and payable under the previous claims for progress payments.

The Goods and Services Tax or Harmonized Sales Tax (GST/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.

3. The Contractor must prepare and certify **one PDF copy** of the claim on form PWGSC-TPSGC 1111, and send **it by e-mail** to the Contracting Authority and Project Authority identified under the section entitled “Authorities” of the Contract, with copy to the following:

CSA e-mail address: asc.facturation-invoicing.csa@canada.ca

PWGSC e-mail address: QueReclamationsMontreal/QueMontrealClaims@tpsgc-pwgsc.gc.ca

4. **If mailed**, the Contractor must prepare **one (1) certified original and two (2) copies** of the claim on form PWGSC-TPSGC 1111, and forward:

a) the **original and one (1) copy** to the Canadian Space Agency at the address shown on page 1 of the Contract under "Invoices" (Financial Services Section) for appropriate certification by the Project Authority identified herein after inspection and acceptance of the Work takes place;

and,

b) **one (1) copy of the original** progress claim to the Contracting Authority identified under the section entitled “Authorities” of the Contract.

5. The CSA's Financial Services Section will then forward the original and one (1) copy of the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

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

### 7.13 Certifications and Additional Information

#### 7.13.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

#### 7.13.2 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the

Contractor will be added to the "FCP Limited Eligibility to Bid" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

### 7.14 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Quebec.

### 7.15 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:
4001 (2015-04-01), Hardware Purchase, Lease and Maintenance;
4002 (2010-08-16), Software Development or Modification Services;
4003 (2010-08-16), Licensed Software;
4004 (2013-04-25), Maintenance and Support Services for Licensed Software;
(c) the general conditions 2035 (2018-06-21), General Conditions - Higher Complexity - Services;
(d) Annex A, Statement of Work;
(e) Annex A-1, Organizational Values and Ethics Code;
(f) Annex B, Basis of Payment;
(g) Annex C, Security Requirements Check List;
(h) Annex C-1, Security Classification Guide;
(i) Annex D, Mandatory Non-Disclosure Agreement (NDA)
(j) Annex E, Service Level Agreement;
(k) Annex F, Federal Contractors Program for Employment Equity-Certification;
(l) Annex G, Task authorization form;
(m) Annex H, Non-Disclosure Agreement;
(n) Attachment 1 to part 3 - bid preparation instructions for Satellite Flight Operations and Data Management Services;
(o) Attachment 2 to part 3 of the bid solicitation - electronic payment instrument(s);
(p) Attachment 1 to part 4 of the bid solicitation - evaluation procedures and basis of selection for Satellite Flight Operations and Data Management Services;
(q) the signed Task Authorizations (including all of its annexes, if any);
(r) the Contractor's bid dated _____.

### 7.16 Foreign Nationals (Canadian Contractor)

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

### 7.17 Insurance - No Specific Requirement

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

### 7.18 Controlled goods Program

*SACC Manual* clause A9131C (2014-11-27), Controlled Goods Program

### 7.19 Work Site Access

*SACC Manual* clause A1009C (2008-05-12), Work Site Access

### 7.20 Directive on Communications with the Media

**1. Definitions**

"Communication Activity(ies)" includes: public information and recognition, the planning, development, production and delivery or publication, and any other type or form of dissemination of marketing, promotional or information activities, initiatives, reports, summaries or other products or materials, whether in print or electronic format that pertain to the present agreement, all communications, public relations events, press releases, social media releases, or any other communication directed to the general public in whatever form or media it may be in, including but without limiting the generality of the preceding done through any company web site. This excludes scientific publications, scientific presentations and scientific demonstrations of the results derived from this project.

**2 Communication Activities Format**

The Contractor must coordinate early on with the Canadian Space Agency (CSA) all Communication Activities that pertain to the present contract.

Subject to review and approval by the CSA, the Contractor may mention and/or indicate visually, without any additional costs to the CSA, the CSA's participation in the contract through at least one of the following methods at the complete discretion of the CSA:

a. By clearly and prominently labelling publications, advertising and promotional products and any form of material and products sponsored or funded by the CSA, as follows, in the appropriate official language:

"This program/project/activity is undertaken with the financial support of the Canadian Space Agency."

"Ce programme/projet/activité est réalisé(e) avec l'appui financier de l'Agence spatiale canadienne."

b. By affixing CSA's corporate logo on print or electronic publications, advertising and promotional products and on any other form of material, products or displays sponsored or funded by the Canadian Space Agency.

Any and all mention or reference to the Canadian Space Agency in addition to those specified above in (a) and (b) must be specifically accepted by the CSA prior to publication.

The Contractor must obtain and use a high resolution printed or electronic copy of the CSA's corporate identity logo and seek advice on its application, by contacting the Project Authority as mentioned in Paragraph 7.5.2 of this contract.

**3 Communication Activity Coordination Process**

The contractor must coordinate with the CSA's Directorate of Communications and Public Affairs all Communication Activities pertaining to the present contract. To this end, the contractor must:

a. As soon as the Contractor intends to organize a Communication Activity, send a Notice to the CSA's Directorate of Communications and Public Affairs. The Communications Notice

must include a complete description of the proposed Communication Activity. The Notice must be in writing in accordance with the clause Notice included in the general conditions applicable to the contract. The Communications Notice must include a copy or example of the proposed Communication Activity.

b. The contractor must provide to the CSA any and all additional document in any appropriate format, example or information that the CSA deems necessary, at its entire discretion to correctly and efficiently coordinate the proposed Communication Activity. The Contractor agrees to only proceed with the proposed Communication Activity after receiving a written confirmation of coordination of the Communication Activity from the CSA's Directorate of Communications and Public Affairs.

The Contractor must receive beforehand the authorization, approval and written confirmation from the CSA's Directorate of Communications and Public Affairs before organizing, proceeding or hosting a communication activity

## ANNEX «A»

## STATEMENT OF WORK

The Statement of Work (Annex A) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX «A-1»

## ORGANIZATIONAL VALUES AND ETHICS CODE

The Organizational Values and Ethics Code (Annex A-1) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX «B»

## BASIS OF PAYMENT

### A BASIS OF PAYMENT - SCHEDULE OF MILESTONES

**(Annex A, Section 4 – Description of Mandatory Work and Section 7- Contractual Framework Requirements)**

Refer to Attachment 1 to part 3 of the bid solicitation, Bid preparation instructions, 2.1 Firm Fixed Price Portion of the Contract for the Volumetric Data

The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

| Milestone | Deliverable | Firm Amount | Date |
|---|---|---|---|
| **1** | Kick-Off Meeting(KOM) | N/A | Before OMRR |
| **2** | Operations and Maintenance Readiness Review (OMRR) (Phase-In Phase) | $ | Beginning Y1 |
| **3** | Service Readiness Review (SRR) | N/A | End Y1 |
| **4** | Operations Service Review (OSR1) | $ | End Y1 |
| **5** | Operations Service Review (OSR2) | $ | End Y2 |
| **6** | Operations Service Review (OSR3) | $ | End Y3 |
| **7 Option** | CCR and Phase-Out | $ | End Y3 |
| **8 Option** | Operations Service Review (OSR4) | $ | End Y4 |
| **9 Option** | CCR and Phase-Out | $ | End Y4 |
| **10 Option** | Operations Service Review (OSR5) | $ | End Y5 |
| **11 Option** | Contract Completion Review (CCR) and Phase-Out | $ | End Y5 |
| | **TOTAL: (applicable taxes extra if applicable)** | **$_____** | |

## B BASIS OF PAYMENT - TASK AUTHORIZATION

**(Annex A, Section 5 - Description of Services through Task Authorization)**

**1. LABOUR**: at the following firm all-inclusive hourly rates:

Please refer to Table 1 All-inclusive labour hourly rates* for optional Task Authorization work per Skillset of Attachment 1 to part 3 of the bid solicitation Bid preparation instructions for the Volumetric Data;

The estimated number of days for each resources category data has been provided to Bidders to assist them in preparing their bids. The inclusion of these data in this bid solicitation does not represent a commitment by Canada that Canada's future usage of the service identified in this bid solicitation will be consistent with this data. It is provided purely for information purposes.

| Labour Category | Contract Period Firm Rates all-inclusive | | | | |
|---|---|---|---|---|---|
| | Year 1 | Year 2 | Year 3 | Option Year 4 | Option Year 5 |
| **Technician, Spacecraft Operation** | $ | $ | $ | $ | $ |
| **Technician, Ground Systems** | $ | $ | $ | $ | $ |
| **Technician, Mission Planning** | $ | $ | $ | $ | $ |
| **Analyst, Network and Computer Systems** | $ | $ | $ | $ | $ |
| **Analyst, Software** | $ | $ | $ | $ | $ |
| **Analyst, Image Quality** | $ | $ | $ | $ | $ |
| **Analyst, Order Desk** | $ | $ | $ | $ | $ |
| **Analyst, Image Processing** | $ | $ | $ | $ | $ |
| **Engineer, Spacecraft** | $ | $ | $ | $ | $ |
| **Engineer, Ground Systems** | $ | $ | $ | $ | $ |
| **Engineer, Data Management** | $ | $ | $ | $ | $ |
| **Engineer, Quality Assurance** | $ | $ | $ | $ | $ |
| **Supervisor/Manager** | $ | $ | $ | $ | $ |

## 2. TRAVEL AND LIVING EXPENSES:

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal and private vehicle expenses provided in Appendices B, C and D the National Joint Council (NJC) Travel Directive (http://www.njc-cnm.gc.ca/directive/travel-voyage/index-eng.php), and with the other provisions of the directive referring to "travellers", rather than those referring to "employees" are applicable.

All travel must have prior authorization of the Technical Authority. All payments are subject to government audit.

**Canada is limiting the total amount related to travel and living expenses and must not exceed;**

**TOTAL: $250,000**

**TOTAL ESTIMATED COST TO A LIMITATION OF EXPENDITURE (1 + 2)**: **$ _____**
(Applicable taxes extra)

## C BASIS OF PAYMENT – INCENTIVE SCHEME

The incentive scheme will not be part of the evaluation.

The annual cap for the incentives is up to a maximum of 10% of the total value of the service for the Mandatory work without consideration of the services through Task Authorization.

Refer to Annex E – Service level agreement, section 4.

The proposed Service Incentive Scheme is as follows:

$$COST = \Sigma\ (WEIGHT \times (SIGN)(METRIC - TARGET)/TARGET) \times SERVICE\ VALUE/4$$

Where:

- WEIGHT factor and TARGET taken from KPI tables
- SIGN is "**+**" if the METRIC is desired to be greater than the TARGET, and "**–**" if the METRIC is desired to be smaller than the TARGET
- METRIC measured as per KPI tables, systematically and periodically
- COST, Incentive computed quarterly
- COST Cap = +10% SERVICE VALUE of the mandatory work for the year, to be paid as per Contract's Basis of Payment

Example:

Let's assume 2 KPIs:

SERVICE VALUE

$TARGET_1$ = ≥99.5%, $SIGN_1$ = "+", $METRIC_1$ = 100%, $WEIGHT_1$ = 10

$TARGET_2$ = ≥10min, $SIGN_2$ = "+", $METRIC_2$ = 8min (underperformance), $WEIGHT_2$ = 0.05

- COST = (10x(+)(100% - 99.5%)/99.5% + 0.05x(**+**)(8min-10min)/10min) x SERVICE VALUE/4 = +1.006% x SERVICE VALUE in that Quarter.

## ANNEX «C»

## SECURITY REQUIREMENTS CHECK LIST

The Security Requirements Check List (Annex C) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX «C-1»

## SECURITY CLASSIFICATION GUIDE

The Security Classification Guide (Annex C-1) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX «D»

## MANDATORY NON-DISCLOSURE AGREEMENT (NDA)

The Mandatory Non-Disclosure Agreement (Annex D) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX E

## SERVICE LEVEL AGREEMENT

The Service Level Agreement (Annex E) appended to the bid solicitation package is to be inserted at this point and forms part of the document.

## ANNEX "F" to PART 5 OF THE BID SOLICITATION

## FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit Employment and Social Development Canada (ESDC) – Labour's website.

Date: _____ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

( ) A1. The Bidder certifies having no work force in Canada.

( ) A2. The Bidder certifies being a public sector employer.

( ) A3. The Bidder certifies being a federally regulated employer being subject to the Employment Equity Act.

( ) A4. The Bidder certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

( ) A5.1. The Bidder certifies already having a valid and current Agreement to Implement Employment Equity (AIEE) in place with ESDC-Labour.

**OR**

( ) A5.2. The Bidder certifies having submitted the Agreement to Implement Employment Equity (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

( ) B1. The Bidder is not a Joint Venture.

**OR**

( ) B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

**ANNEX "G"**

**TASK AUTHORIZATION FORM**

| | |
|---|---|
| **Contract No: 9F044-190433/001/MTB** | **Task Authorization No:** |
| **Period covered:** | **Task Authorization Revision No:** |
| **Title:** | |

**PART 1:** Request: To be completed by the Project Authority:

You are requested to consider the following task or revise task and to submit, without delay, your proposal for the performance of this Work, in accordance with the provisions of the Task Authorization clause of the above referenced Contract.

| | | |
|---|---|---|
| **Description of the Work** | as follows: | see attached: |
| **Labour:** | as follows: | see attached: |
| **Travel and living expenses**: | as follows: | see attached: |
| **Delivery and required delivery dates:** as follows: | | see attached: |

**For the Project Authority:**

| _____ | _____ | _____ |
|---|---|---|
| **Name** | **Signature** | **Date** |

**PART 2: Proposal to be completed by Contractor:**

**Cost Breakdown:**
**Labour:**

| Name | Category | Estimated Number of Hours | Firm Hourly Rate | Estimated Costs |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Estimated Cost of Labour: $**

**Travel and Living Expenses:**
All travel must have the prior authorization of the Project Authority

**Date of approval:**

**Specify:**

**Estimated Costs: $_____**

**TOTAL ESTIMATED COST:** applicable taxes extra: **$_____**

**For the Contractor:**

_____ _____ _____
**Name of person authorized to sign On behalf of Contractor** **Signature** **Date**

**PART 3: Authorization:**

**For the Project Authority:**

_____ _____ _____
**Name** **Signature** **Date**

| |
|---|
| **PART 4: Completion of Task:** |
| **For the Contractor:**<br><br>**I state that the work has been completed according to the agreed terms of the TAR.**<br><br>_____ _____ _____<br>**Name** **Signature** **Date** |
| **Actual Cost: $_____** |
| **Labour: $_____** |
| **Travel and Living Expenses:$_____** |
| **For the Project Authority:**<br><br>**I Concur that the work has been completed according to the agreed terms of the TAR.**<br><br>_____ _____ _____<br>**Name** **Signature** **Date** |

## ANNEX H

## NON-DISCLOSURE AGREEMENT CONTRACT

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. **9F044-190433/001/MTB** between Her Majesty the Queen in right of Canada, represented by the Minister of Public Works and Government Services and the Canadian Space Agency, 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.

Nothing in this NDA should be construed as preventing the disclosure or use of any confidential information to the extent that such information:

(a) is or becomes in the public domain through no fault of the employee or any proposed subcontractor;
(b) is or becomes known to the employee from a source other than Canada, except any source that is known to the employee to be under an obligation to Canada not to disclose the information; or
(c) is disclosed under compulsion of a legislative requirement or any order of a Court or other tribunal having jurisdiction.

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 agree I will not remove any copyright, confidential, proprietary rights, or intellectual property notices attached to or included in any Confidential Information.

I recognize that, without restricting the generality of the foregoing, no license or conveyance of any rights under any discoveries, inventions, patents, trade secrets, copyrights, or other form of intellectual property is granted or implied by the disclosure of Confidential Information under this NDA.

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. For the purposes of this agreement, these measures include but not limited to: ensure privacy of meetings, with only people selected on a need to know basis, including teleconferences and videoconferences, and to use prescribed encryption methods for information exchange.

I undertake to immediately notify the PWGSC's Contracting Authority if any person, other than the Supplier's current employees accesses the Confidential Information at any time.

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.: **9F044-190433/001/MTB.**

_____ _____

Signature Date

## ATTACHMENT 1 TO PART 3

## BID PREPARATION INSTRUCTIONS

Note: Bid documents must be separated as per instructions in PART 3

### 1. Technical Bid Instructions

The technical bids must clearly demonstrate:

1. The Contractor Team's relevant experience in each of the following Domains as defined in the Statement Of Work (SOW):
   - Satellite Flight Operations
   - Satellite Data Management
   - Satellite Ground System Operations and Maintenance
   - In addition, the Bidder must provide a substantive description of experience for Service Integration related to Satellite Flight Operations and Data Management.

2. The qualifications and relevant experience of key personnel selected for this Contract with respect to all the skillsets enumerated in Table 4

3. The understanding of the requirements through:
   1. Preparing a comprehensive Service Management and Implementation Plan (SMIP) as per SOW DID-001 and aligned with the context of operations at CSA
   2. Formulating meaningful Performance Indicators (PI) as per Service Level Agreement (SLA) and aligned with the mission objectives

4. In addition, the technical bid should include a Value-Added Proposal (VAP) with emphases on:
   1. Partnership with Canadian Small & Medium Enterprise (SME),
   2. Implementation of specific innovative changes to automate operational systems and processes in order to reduce operational cost and/or complexity, or
   3. Leveraging of the current infrastructure to increase the benefits to Canada, at no additional cost to CSA while complying with the security constraints.

   The VAP will be evaluated as part of the technical evaluation and will weight against the Technical Score as per Evaluation Criteria attachment to PART 4 EVALUATION PROCEDURES AND BASIS OF SELECTION.

### 2 Financial Bid Instructions

### 2.1 Firm Fixed Price Portion of the Contract

The major portion of this Contract covers Mandatory Work as per SOW Section 4 and is subject to the Contractor performance as described in the SLA. However, the Mandatory Work will apply only to those Missions declared to be in the Operational state by the CSA. Therefore, the Contractor must expect and accept fluctuations in Contract Value over the course of the Contract duration according to the Missions actually in operation. For forecasting purpose only, the projected Mission Timeline is available in the SOW Section 3, and is subject to change upon mission funding approval cycles. Actual Costs will be established pro-rated on the number of months a Mission was actually in the Operational State during the year, starting at Operations & Maintenance Readiness Review. In order to allow for exact calculation of the FFP Cost at

any given time, financial bids must include a detailed cost breakdown per year, per Domain and Mission as follow:

**Table 2 Financial cost breakdown for Mandatory Work during Initial, Nominal and Extended Operation Phases per Year**

| | Ground Systems & Flight Operations (SOW Sections 4.1 and 4.3) | Data Management (SOW Section 4.2) | Total per year** |
|---|---|---|---|
| COMMON COSTS* | | | |
| SCISAT | | | |
| NEOSSAT | | | |
| M3MSAT | | | |
| RCM-1 | | | |
| RCM-2 | | | |
| RCM-3 | | | |
| SUBTOTAL 1 | | | |

*fixed-costs to cover non mission-specific activities as per SOW Sections 4.3, 6 and 7 (excluding optional phases).

**The Total per year will be payable at the completion of each Operation Service Review (OSR) milestones described in the SOW Section 7.

### 2.2 Phase-In and Phase-Out Phases of the Contract

In addition, to the above nominal costs during the Initial, Nominal and Extended Operation Phases, financial bids must include a detailed cost breakdown for the Phase-In Phase and the optional Phase-Out Phase as described in the SOW Section 7.

**Table 3 Financial cost breakdown for optional Phases**

| | Ground Systems & Flight Operations | Data Management | Total** |
|---|---|---|---|
| Phase-In Phase (Section 7.1) | | | |
| Optional Phase-Out Phase surcharge* (Section 7.5) | | | |
| SUBTOTAL 2 | | | |

*While conducted in parallel to the Nominal or Extended Operation Phase work, this cost surcharge should only cover for the optional scope related to training and transition activities to a new Service Provider.

**The Total will be payable at the completion of each specific milestone.

### 2.3 Task Authorization Portion of Contract: Time & Material Portion

A small portion of this Contract covers for Work through task authorization as per SOW Section 5. Description of Services through Task Authorization will be executed through Task Authorization and may include work but not limited to the following:

- Support to Ad-hoc Operational Activities,
- Development of New Operational Capability,
- Level-3 Facility Hardware Maintenance, and
- Training

In order to evaluate Costs under this process, financial bids must include all-inclusive labour hourly rates according to the skillset required for the Optional Work as follow:

**Table 4 All-inclusive labour hourly rates* for optional Task Authorization work per Skillset**

| | Cumulative** level of effort hours/year | Year 1 | Year 2 | Year 3 | Optional Year 4 | Optional Year 5 | Total for 5 years |
|---|---|---|---|---|---|---|---|
| Technician, Spacecraft Operation | 100 | | | | | | |
| Technician, Ground Systems | 1000 | | | | | | |
| Technician, Mission Planning | 100 | | | | | | |
| Analyst, Network and Computer Systems | 1000 | | | | | | |
| Analyst, Software | 1000 | | | | | | |
| Analyst, Image Quality | 100 | | | | | | |
| Analyst, Order Desk | 100 | | | | | | |
| Analyst, Image Processing | 100 | | | | | | |
| Engineer, Spacecraft | 1000 | | | | | | |
| Engineer, Ground Systems | 1000 | | | | | | |
| Engineer, Data Management | 1000 | | | | | | |
| Engineer, Quality Assurance | 100 | | | | | | |
| Supervisor/Manager | 100 | | | | | | |
| | | | | | | SUBTOTAL 3 | |

*Hourly rates must include overhead, G&A, markup, and profit.

**Cumulative level of effort are estimates for Bid evaluation purposes only, and do not reflect the actual need nor does it represent a commitment by Canada that Canada's future usage of the services described in the bid solicitation will be consistent with this data.

### 2.4 Total Price

For the purpose of Proposal evaluation, the Proposal's Price correspond to 5 years of operations as per Table 1, Table 2 and Table 3 according to the following formulae:

Price = (5 x SUBTOTAL 1) + SUBTOTAL 2 + SUBTOTAL 3

The pricing score will be determined as per PART 4 EVALUATION PROCEDURES AND BASIS OF SELECTION of this RFP.

## ATTACHMENT 2 to PART 3 OF THE BID SOLICITATION

## ELECTRONIC PAYMENT INSTRUMENT(S)

### ELECTRONIC PAYMENT INSTRUMENTS

The Bidder accepts to be paid by any of the following Electronic Payment Instrument(s):

( ) VISA Acquisition Card;

( ) MasterCard Acquisition Card;

( ) Direct Deposit (Domestic and International);

( ) Electronic Data Interchange (EDI);

( ) Wire Transfer (International Only);

( ) Large Value Transfer System (LVTS) (Over $25M)

## ATTACHMENT 1 TO PART 4 OF THE BID SOLICITATION

## EVALUATION PROCEDURES AND BASIS OF SELECTION FOR SATELLITE FLIGHT OPERATIONS AND DATA MANAGEMENT SERVICES

The Attachment 1 to part 4 of the bid solicitation appended to the bid solicitation package is to be inserted at this point and forms part of the document.

**ANNEX A**

**STATEMENT OF WORK**

**FOR**

**SATELLITE FLIGHT OPERATIONS AND DATA MANAGEMENT SERVICES**

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# Contents

## Table of Figures



## Table of Tables

# 1 Introduction

## 1.1 Background

### 1.1.1 Government priorities & Canada`s Space Strategy

Canada's Space Strategy (RD-01) identifies "Positioning Canada's commercial space sector to help grow the economy and create the jobs of the future"[1] as a significant priority for the Government of Canada. As such, the present Statement of Work for Satellite Flight Operations and Data Management Services emphasizes the importance of "partnering with the industry to make investments and create jobs here in Canada"[1].

Another set of priority activities under Canada's Space Strategy (RD-01) aims at "ensuring Canada's leadership in acquiring and using space-based data to support science excellence, innovation and economic growth"[1]. The present SOW therefore underscores the requirement to ensure continuous, timely and reliable delivery of Satellite Flight Operations and Data Management Services data from CSA satellites, to support Canadian and international users and hence, sustain and benefit from Canada's investments in space systems and space data services.

### 1.1.2 Role of CSA and Satellite Operations

Every day, Canadian and international satellites meet the needs of users, in Canada and around the world. From space, they provide information and services to support Earth observation, maritime surveillance, space surveillance, ecosystems monitoring, environmental monitoring, natural disaster management, the national economy, security and defense, and health.

The Space Exploitation directorate within the Space Utilization sector of the CSA ensures the monitoring, commanding and safeguarding of the Canadian space assets under its responsibility, as well as to ensure delivery of each mission's objectives to the benefit of the user community. This SOW is a key component to continue providing all the necessary operational activities required to deliver and extract maximum benefits from each CSA operational mission.

## 1.2 Purpose

This document describes the work to be performed by The Contractor, in support of Satellite Flight Operations and Data Management Services for satellite missions undertaken by the Canadian Space Agency (CSA).

## 1.3 Scope

The work described herein pertains to operation and maintenance of specified portions of the overall operational system, including flight engineering, data management, basic operational system maintenance, and life-cycle support. Work described herein will be undertaken primarily during routine operation, system commissioning, and/or system de-commissioning.

The work consists of mandatory Services that the Contractor must fulfill as per requirements herein and subject to the Firm-Fixed Price (FFP) process described for this Contract and Key Performance Indicators (KPIs) described in the Service-Level Agreement (SLA) [AD-01]. Such work has been carried out at the CSA headquarters for over 20 years, in the course of the RADARSAT-1 and SCISAT-1 missions. Missions potentially addressed in this work include, but are not limited to, SCISAT, NEOSSat, M3MSat and RADARSAT Constellation Mission (RCM), assuming all are operating at the start of the Contract. In addition, the Government of Canada RADARSAT Data Services (GRDS), which covers the Government part of data management (order handling) for the RADARSAT-2 mission, is also included.

[1] Canada's Space Strategy (RD-01)

In addition to the fixed services, there may be additional work required and requested to be performed by the Contractor through a Task Authorization process.

The portion of the operational system involved in this work is restricted to those elements necessary for each included mission's flight and ground system operations and data management, and under CSA responsibility (as described in Section 3), including the spacecraft, the ground-based control systems, the data ordering, calibration and processing systems, the communication sub-networks internal to Missions Operations Centre (MOC) at St-Hubert or Backup Control Facility (BCF) in Ottawa, as well as mission-specific interfaces required to distribute data acquired from the satellite to the data users and client delivery platforms specific to each missions (as described in Section 3). This also includes procedures required to execute the work. CSA will provide the operational system and its constituent elements "as is" as described in Section 3. Some of these items are part of the CSA generic infrastructure and others are supplied specifically for each mission undertaken. These tools will be provided "as is" and in a condition suitable to be used for Operations. The Contractor may choose to use other tools as long as all operational requirements are met.

At present, operational system elements are installed at:

1. Low-Earth Orbit (LEO satellites),
2. CSA's Mission Operations Centre (MOC): Primary Control Facility (SHUB PCF) and Calibration Facilities in Longueuil (St-Hubert), Quebec,
3. CSA's David-Florida Laboratory Backup Control Facility (DFL BCF) in Ottawa, Ontario,
4. NRCan's Gatineau Satellite Station (GSS), Cantley, Quebec,
5. NRCan's Prince-Albert Satellite Station (PASS), Prince-Albert, Saskatchewan,
6. NRCan's Inuvik Canadian Satellite Facility (ICAN), Inuvik, North-West Territories,
7. MDA's St-Hubert TT&C antenna station (SHUB) in Longueuil (St-Hubert), Quebec,
8. MDA's Saskatoon TT&C antenna station (SASK) in Saskatoon, Saskatchewan, and
9. Kiruna antenna station (KRN), operated by Swedish Space Corporation, at Esrange Space Center, Kiruna, Sweden.

Elements 1 to 6 are Government assets and elements 7 to 9 are infrastructure provided by partners. Government owned assets should be considered Government Furnished Equipment (GFE). Access to our partners' infrastructure can be considered Government Furnished Services (GFS) since they are managed by CSA through other agreements. In the event that government owned assets are located in our partners' infrastructure these will also be considered GFE. See Section 3.2 for more details about infrastructure. Additional facilities in Canada may be used in the future. It should be noted that the Contractor will only be responsible for specific infrastructure elements under CSA's authority, as well as space segment elements. The Contractor will interface as required with external entities such as NRCan, Shared Services Canada (SSC) and other contractors / support providers as required to deliver on the operations services defined in this statement of work.

Taken together, systems owned by the Government of Canada will be considered GFE. Access to systems or services owned by third parties will be considered GFS. CSA will be responsible for providing GFEs and providing reasonable access to GFS. CSA will not be held responsible for any damages caused by the loss of service or lack of access to GFS since the services are provided through third party infrastructure and third party agreements. In support of the Satellite Flight Operations and Data Management Services covered in the scope of this Contract, these GFE include:

- MOC Facility Infrastructure in St-Hubert and DFL (building, office space)
- Security services
- Antenna access services

- Antenna Reservation System (ARS)
- Wide-Area Network (WAN) services connecting various facilities
- Conjunction Risk Assessment and Mitigation System (CRAMS) services, providing analysis reports on upcoming conjunctions/close approaches for applicable missions.
- Calibration Facilities
- Mission-specific ground segment hardware, software and procedures for all applicable missions, as detailed in Section 3.1.2.

Procedures guiding the interface with external entities are managed by CSA and will be provided to the Contractor..

## 1.4 Conventions and Definitions

### 1.4.1 Language Convention

As English is the common oral and written language for space operations, the Contractor must use English for this Work, and for exchanges with the CSA and its partners, along with System International (SI) units.

### 1.4.2 Document Convention

A number of the sections in this document describe controlled requirements and specifications and therefore the following verbs are used in the specific sense indicated below:

“Must” is used to indicate a mandatory requirement,

“Should” indicates a preferred alternative but not mandatory,

“May” indicates an option,

“Will” indicates a statement of intention or fact, as does the use of present indicative active verbs.

### 1.4.3 Terminology

“Anomaly”: problem, error, or abnormal functioning of a system which may lead to sub-optimal system performance and prevent Routine Operation, and which requires Operational System Maintenance.

“COLA” Collision Avoidance: the processes related to receiving and analyzing Conjunction reports (typically from CRAMS) and, if required (applicable to satellites with propulsion), preparing collision avoidance maneuvers to be executed on the satellite.

"Contractor": team that will conduct the work, which could be a mixed team drawn from Canadian industry, universities or research institutes, including subcontractors.

"Contractor Operational Personnel": all individuals identified and assigned by the Contractor to undertake tasks described in this Statement of Work throughout the contract period.

"Conjunction Risk Assessment and Mitigation System" (CRAMS): Maintained and operated by CSA, CRAMS provides operators with orbital conjunction analysis reports shortly after conjunction alerts publication by appropriate authorities.

“Data Management”: subset of all mission activities related to the mission payload data ordering, reception, processing, calibration, distribution and archiving, and the maintenance of related system and procedures.

“Domain”: is an area of Satellite Operation activities covering Flight Operations, Data Management and Ground Systems Operation and Maintenance.

"Flight Operations": subset of all mission activities related to spacecraft health, monitoring and control, spacecraft activity planning, flight dynamics, collision avoidance and orbital maintenance, and the maintenance of its system and procedures.

"Government Furnished Personnel" (GFP): Government employees paid by the government and lent to the Contractor, part or full-time, for an agreed period of time to accomplish work under the Contractor's responsibility and authority.

"Ground System Operations": subset of all activities related to satellite infrastructure, ground antennas Telemetry, Tracking & Control, communication systems, networking, and the maintenance of its system and procedures.

"ITOS" (Integrated Test and Operations System): the spacecraft command/control and telemetry processing system used for most CSA-based missions and several NASA missions. Mission-specific databases, pages and tools have been developed for all CSA missions to support routine operations, spacecraft monitoring, anomaly detection and other aspects of flight operations. Maintained by the Hammers Company, ITOS™ has evolved into Galaxy™ [RD-02, RD-03].

"Mission": the complete life cycle of a satellite and its products, from pre-launch preparation to de-commissioning.

"Operational Database": the collection of all data elements, resident in the Operational System, required for its on-going operation, including operational procedures, drawings, configuration files, spacecraft databases, software executables, source code, issues databases, anomaly databases and documentation.

"Operational Product": a data element, derived from the operational schedule, whose flow between elements of the operational system constitutes a portion of an operational activity.

"Operational System": the collection of all software, hardware, and operational database elements required to conduct those operational activities required to complete the mission.

"Operational System Maintenance": operational activities pertaining the monitoring and trending of system availability and performance, the recovery to normal or nominal mode of operation in case of anomaly detection or system failure, and the improvement of systems for increased level of functionality, reliability, availability, and automation. This includes Level 1, 2, and 3 Maintenance as detailed below.

| | **Level 1 Maintenance** | **Level 2 Maintenance** | **Level 3 Maintenance** |
|---|---|---|---|
| Flight Software (FSW) | Maintenance requiring operational expertise.<br><br>Examples include, but are not limited to: flight table generation and upload, flight software upload. | Maintenance requiring high expertise in the system and low to intermediate expertise in the application programs.<br><br>Examples include, but are not limited to: table modification which require operational update, parameter generation, parameter calibration, support to anomaly isolation and analysis. | Maintenance requiring high expertise in the system and the application programs.<br><br>Examples include, but are not limited to: flight software update, table modification impacting FSW. |

| | Level 1 Maintenance | Level 2 Maintenance | Level 3 Maintenance |
|---|---|---|---|
| Ground Software | Routine maintenance.<br><br>Examples include, but are not limited to: routine backup, monitoring of local and network disks and database resource usage, monitoring of all event reporting from subsystems, reboot of equipment. | Maintenance to maintain operational performances.<br><br>Examples include, but are not limited to: updating system configuration, installation, testing and deployment of software patches (OS and operational SW), recovering activities in the event of failure or operator errors, maintaining the integrity of the databases and virus/security SW, support to anomaly isolation and analysis. | Software upgrades and enhancements.<br><br>Examples include, but are not limited to: Changes to SW due to errors/bugs, due to platform, COTS, component-ware upgrade or obsolescence, due to changes in requirements. |
| Ground Hardware | Maintenance at the subsystem level.<br><br>Examples include, but are not limited to: Regular network support/maintenance including most security-related operations, Keying, change of PC, network reconfiguration. | Maintenance at the Line Replaceable Unit (LRU) level.<br><br>Examples include, but are not limited to: Remove and replace LRUs, change graphic card in PC. | Maintenance at the sub-LRU level.<br><br>Examples include, but are not limited to: Repair defective LRUs, perform special alignments. |

“Routine Operations”: normal or nominal day-to-day operational activities leading to the delivery of mission objectives, while the system is not in critical, emergency or recovery modes of operation.

“SCAN” Spacecraft Anomaly Notice: Contains the summary information of a Spacecraft anomaly event, including the anomaly occurrence time, the detection time, the recovery time and notification times.

“Spacecraft Control System” (SCS): The Ground-Segment components that ensure the Spacecraft Control function (e.g. Flight Dynamics System, Real-time Command and Telemetry System, Spacecraft Planning System).

“Spacecraft Health and Safety” (SCHM): Represents monitoring, control and reporting on normal and abnormal behaviours of the satellite such as parameters above limits, thresholds, and system warnings, alarms and faults.

“Space Asset” or “Space Segment Asset” (SSA): Satellite systems (spacecraft bus and payload components) of a mission in orbit.

“Sustaining Engineering”: subset of Operational System Maintenance focussed on Level 3 Maintenance and some Level 2 Maintenance.

“System Commissioning”: subset of operational activities pertaining the qualification of a system into routine operations, including on-orbit procedure qualification and calibration of space assets.

“System De-commissioning”: subset of operational activities pertaining the operations closure of a system, storage and archiving of mission data and disposal of equipment and assets.

### 1.4.4 Acronyms

| | |
|---|---|
| AD | Applicable Document |
| AIS | Automatic Identification of Ships |
| ARS | Antenna Reservation System |
| BCF | Backup Control Facility, 3701 Carling Ave, Ottawa, Ontario |
| BoP | Basis of Payment |
| CA | Contract Authority |
| CADMS | Configuration And Data Management System |
| CCB | Change Control Board |
| CCR | Contract Completion Review |
| CF | Contractor Format |
| CM | Configuration Management |
| CoC | Certificate of Conformance |
| COLA | Collision Avoidance |
| CRB | Change Review Board |
| CSA | Canadian Space Agency, responsible for the overall management of this Contract |
| CSE | Communications Security Establishment |
| CFS | Canadian Forest Service |
| DFL | David Florida Laboratory, 3701 Carling Ave, Ottawa, Ontario |
| DND | Department of National Defence |
| DRDC | Defence R&D Canada |
| ECCC | Environment and Climate Change Canada |
| ESD | Electro Static Discharge |
| EODMS | NRCan's Earth Observation Data Management System |
| EOP | Extended Operations Phase |
| FD | Flight Dynamics System |
| FHD | Facility Help Desk |
| FTE | Full-Time Equivalent |
| GAC | Global Affairs Canada |
| GFE | Government-Furnished Equipment |
| GFP | Government-Furnished Personnel |
| GFS | Government-Furnished Services |
| GSS | NRCan's Gatineau Satellite Station, Cantley, Quebec |
| ICAN | NRCan's Inuvik Canadian Satellite Facility, Inuvik, North-West Territories |
| IOP | Initial Operations Phase |
| IQS | Image Quality System |
| IR | Initial Release |
| ITOS | Integrated Test and Operations System |

| | |
|---|---|
| ITS | Information Technology System |
| KOM | Kick-Off Meeting |
| KPI | Key Performance Indicator |
| LCS | Life-Cycle Support |
| LEO | Low Earth Orbit |
| LEOP | Launch and Early Operation Phase |
| LRU | Line Replaceable Unit |
| MCC | Mission Control Centre |
| MDA | MacDonald, Dettwiler and Associates |
| MPS | Mission Planning System |
| NA | Not Applicable |
| NC | Non-Conformance |
| NCC | NEOSSat Constraint Checker |
| NDA | Non-disclosure agreement |
| NOP | Nominal Operations Phase |
| NRCan | Natural Resources Canada |
| OA | Operational Authority |
| OAR | Operational Analysis Report |
| OHS | Order Handling System |
| OL | Operating Licence |
| OMP | Operations & Maintenance Plan |
| OMRR | Operations and Maintenance Readiness Review |
| OR | Operational Report |
| OSR | Operations Service Review |
| PA | Product Assurance Authority |
| PASS | NRCan's Prince-Albert Satellite Station, Prince-Albert, Saskatchewan |
| PCF | Primary Control Facility, 6767 route de l'Aéroport, Longueuil (St-Hubert), Québec |
| PE-2 | Polar Epsilon 2 |
| PI | Performance Indicator |
| PIP | Phase-In Phase |
| PGS | Product Generation System |
| PLAN | Spacecraft Activity Planning System |
| PM | Project Manager |
| POP | Phase-Out Phase |
| PSPC | Public Services and Procurement Canada |
| QoS | Quality of Service |
| RAS | Reception & Archiving System |
| RCM | RADARSAT Constellation Mission |
| RD | Reference Document |

| | |
|---|---|
| RFP | Request for Proposals |
| RPT | RADARSAT Precision Transponder |
| SAR | Synthetic Aperture Radar |
| SASK | Saskatoon TT&C antenna station (SASK), 18 Innovation Blvd, Saskatoon, Saskatchewan |
| SCAN | Spacecraft Anomaly Notice |
| SCS | Spacecraft Control System |
| SE | Systems Engineer |
| SLA | Service Level Agreement |
| S&MA | Safety and Mission Assurance |
| SMIP | Service Management and Implementation Plan |
| SOB | System Operation Board |
| SOW | Statement Of Work |
| SPA | System Participant Agreement |
| SRB | System Review Board |
| SRR | Service Readiness Review |
| SSA | Space Segment Asset |
| SSC | Shared Services Canada |
| SwSC | Swedish Space Corporation |
| TA | Technical Authority |
| TT&C | Telemetry, Tracking and Command |
| TTCS | Telemetry, Tracking and Command System |
| TBC | To Be Confirmed |
| TBD | To Be Determined |
| VCM | Verification and Compliance Matrix |
| WAN | Wide Area Network |
| WOSM | Weekly Operation Scheduling Meeting |

# 2 References

## 2.1 Applicable documents

The following documents of the exact issue date and revision level shown are applicable and form an integral part of this document to the extent specified herein.

| ID | Number | Revision | Title |
|---|---|---|---|
| **AD-01** | CSA-MM-AGR-0001 | IR | Service Level Agreement (SLA) for Flight Operations and Data Management Services |
| **AD-02** | laws-lois.justice.gc.ca/PDF/R-5.4.pdf | | Remote Sensing Space System Act (RSSSA) |
| **AD-03** | disasterscharter.org | | International Charter Space and Major Disaster |
| **AD-04** | | | Canadian Space Agency Values and Ethics Organizational Code |

## 2.2 Reference documents

The following documents provide additional information or guidelines that either may clarify the contents or are pertinent to the history of this document.

| ID | Number | Revision | Title |
|---|---|---|---|
| **RD-01** | ST99-60/2019E-PDF | - | Exploration, Imagination, Innovation: A New Space Strategy for Canada |
| **RD-02** | https://hammers.com/galaxy | | Galaxy |
| **RD-03** | https://itos.gsfc.nasa.gov/index.php | | Integrated Test and Operations System |

# 3 Context of Work

## 3.1 Satellite Missions

For a better understanding of the scope of work, missions operated at the CSA are presented below.

### 3.1.1 Mission Roadmap

The Satellite Exploitation directorate at CSA currently operates 4 satellite missions which entail the command and control of a total of 6 government satellites with RCM. In addition, Radarsat-2, which is owned and operated by the private sector, still has services under the responsibility of the Government of Canada, such as the Government RADARSAT Data Services, in order to deliver on Government of Canada requirements for SAR imaging. The estimated timelines for the current CSA missions are presented in Figure 1.

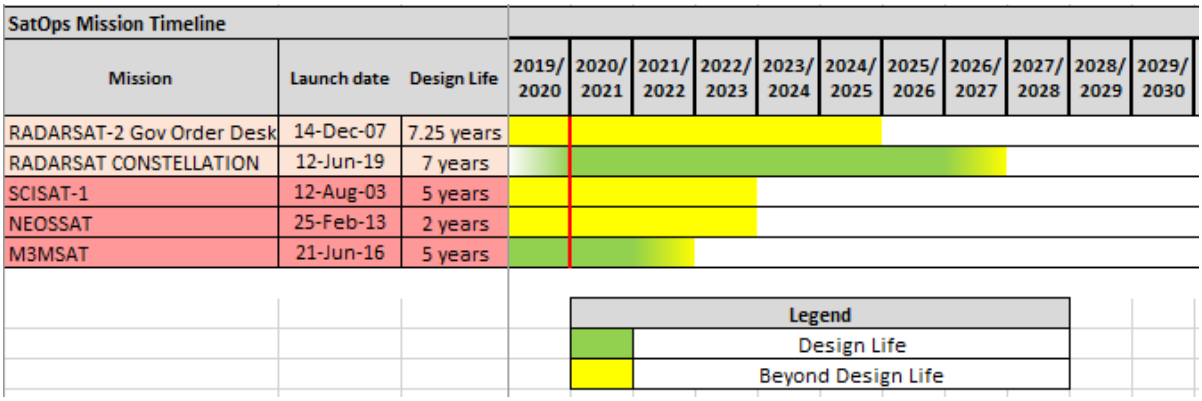



**Figure 1 Satellite Operations' Mission Roadmap**

The scope of Mandatory Work of this contract is routine Satellite Flight Operations and Data Management Services, as detailed in Section 4. Details about data acquisition planning, tasking, telemetry analysis and data processing may differ from mission-to-mission. An example of mission-specific tailoring may be seen between M3MSat for instance, which requires only Flight Operations services, and RCM which also requires extensive Data Management services in order to deliver timely data to operational users across Canada. These Data Management activities are part of the nominal scope of the Mandatory Work as described in Section 4. All applicable mission documentation, source code, tools and procedures will be made available to the Contractor prior to the start of the Work, upon signature of the appropriate NDAs, as required.

In addition to the Mandatory Work, there will be opportunities for Services under Task Authorization, on an “as and when requested” basis as per Section 5, in order to support external missions and future mission development.

The Mandatory Work described above will be subject to the missions actually in operation at any given time, and the extent of the Service will fluctuate during the course of the Contract execution. Therefore, the Contractor must be ready to accommodate for this variance in terms of personnel, processes and contract monetary value. The latter is explained in the associated bid submission instructions where the Contractor is requested to provide proposal cost breakdowns accordingly.

### 3.1.2 Descriptions of Current Operational Missions

#### *3.1.2.1 SCISAT*

Launched on August 12, 2003, SCISAT helps a team of Canadian and international scientists improve their understanding of the depletion of the ozone layer, with a special emphasis on the changes occurring over Canada and in the Arctic.

The Canadian SCISAT mission is a partnership of universities, government, and industry. A scientific team of researchers from around the world, led by University of Waterloo Faculties, is conducting the Atmospheric Chemistry Experiment (ACE) on SCISAT, which aims to measure and understand the chemical processes that control the distribution of ozone in the Earth's atmosphere, particularly in the northern latitudes. Originally intended to last two years, the satellite is still operational and its mission has been extended until 2021.

With a diameter of 112 cm, a height of 104 cm, and a total mass of only 150 kg, SCISAT has a 650-km-high polar orbit, circling the Earth 15 times a day. Its scientific instruments—a Fourier-transform spectrometer and another named MAESTRO (for "Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation")—use sunlight to identify the gases and particles in the Earth's middle atmosphere. The data helps better understand ozone layer depletion.

Flight Operations for SCISAT consist of producing daily station contact times, activity schedules, timelines, flight dynamics products, telemetry analysis reports, and other reports, as well as executing passes to uplink commands, downlink data and troubleshoot anomalies. Data Management for SCISAT is largely automated, and consists of ensuring successful delivery of the data to the users via established means. SCISAT task planning is highly automated as well, as SCISAT operates a relatively straightforward schedule, acquiring science data during every sunrise and sunset it sees.

MOC tools involved in SCISAT operations and used by the Contractor under the scope of this contract include:

- ITOS for spacecraft command and control, including mission-specific database
- SCISAT Flight Dynamics system (OAS)
- SCISAT Simulator
- Spacecraft Health Management software (SCHM)
- SCISAT Planning System (PLAN)
- SCISAT Data Management system

MOC tools are provided “as is” and the Contractor is expected to provide only Level 1 and Level 2 maintenance. Level 3 maintenance and sustaining engineering is excluded from the scope of this contract.

(see APPENDIX 1 for mission Fact Sheet)

#### *3.1.2.2 RADARSAT-2*

Launched in December 2007, RADARSAT-2 uses Synthetic Aperture Radar (SAR) to provide maritime surveillance, ice monitoring, disaster management, environmental monitoring, resource management and mapping in Canada and around the world.

This project represents a collaboration between government and industry. MacDonald, Dettwiler and Associates Ltd. (MDA) owns and operates the satellite and specific elements of the ground segment. The Canadian Space Agency (CSA) helped fund the construction and the launch of the satellite and enabled the supply of RADARSAT-2 data to the Government of Canada during the lifetime of the mission.

RADARSAT-2 is in a sun-synchronous orbit at an altitude of 798 kilometres. The mission had a design life of 7.25 years but continues to operate nominally to this day.

RADARSAT-2 is owned and operated by MDA, and its control centre is located at the PCF within the CSA premises.

Flight Operations for RADARSAT-2 are performed by MDA under a Public Private Partnership agreement between CSA and MDA, and is excluded from the scope of this contract. Data Management for RADARSAT-2, under the scope of this contract, consists of managing the Government of Canada RADARSAT-2 Data Services consisting in the planning and submitting image orders on behalf of the Government of Canada and ensuring their fulfillment.

MOC tools involved in RADARSAT-2 Data Management and used by the Contractor under the scope of this contract include:

- RADARSAT-2 Order Handling System (OHS)
- Acquisition Planning Tool (APT)

MOC tools are provided “as is” and the Contractor is expected to provide only Level 1 and Level 2 maintenance. Level 3 maintenance and sustaining engineering is excluded from the scope of this contract.

(see APPENDIX 1 for mission Fact Sheet)

#### *3.1.2.3 NEOSSAT*

The Near-Earth Object Surveillance Satellite (NEOSSat), launched on February 25, 2013, is the first of a series of microsat class satellites for Canada, developed and operated in collaboration with Defence R&D Canada (DRDC). The world's first space telescope dedicated to detecting and tracking asteroids and satellites, NEOSSat orbits at approximately 800 kilometers above the Earth, circling the globe every 100 minutes, conducting asteroid, comet and other space astronomy observations for CSA and Canadian astronomers and also contributing to space-based tracking of satellites and space debris as part of Canada's commitment to maintaining space situational awareness and contributing to space sustainability.

Due to its lofty location, it is not limited by the day-night cycle, and can operate 24/7. Through NEOSSat, Canada contributes to the international effort to catalogue the near-Earth population of asteroids, producing information that will be crucial to targeting new destinations for future space exploration missions.

Recent developments in NEOSSat image processing have allowed NEOSSat to also contribute to photometric observations of variable stars, enabling follow-up on exoplanet candidates. Astronomy data from NEOSSat is now published automatically on CSA’s Open Data platform, and then also published through NRC’s Canadian Astronomy Data Centre. In 2019, CSA launched a NEOSSat Guest Observer program, which increases the number of astronomers in Canada utilizing NEOSSat data and contributing to task planning.

Flight Operations for NEOSSat consist of producing daily station contact times, validated science schedules, timelines, flight dynamics products, telemetry analysis reports, and other reports, as well as executing passes to uplink commands, downlink data and troubleshoot anomalies. Data Management for NEOSSat is largely automated for data delivery with MOC tools processing and distributing the data to specific locations, depending on whether images are for DRDC or for the astronomy community. NEOSSat task planning is relatively complicated with a variety of users (DRDC + several astronomy teams across Canada) submitting tasking requests, with a variable level of details. DRDC is able to submit tasks in a format directly ingested by the NEOSSat Constraint Checker (NCC). However, astronomers generally do not have such tools necessarily and therefore additional manual planning is required using dedicated tools to implement astronomy task schedules. Adding to the complexity is that DRDC tasking and astronomy tasking can be in conflict with each other, so coordination with CSA and DRDC is needed to ensure that the tasking meets the needs and priorities of all users.

MOC tools involved in NEOSSat operations and used by the Contractor under the scope of this contract include:

- ITOS for spacecraft command and control, including mission-specific database

- NEOSSat Flight Dynamics system (OAS)
- NEOSSat Constraint Checker (NCC) (Perl software)
- NEOSSat Simulator (RSS-GEMS) (Matlab/Simulink-based software)
- NEOSSat Flatsat
- Spacecraft Health Management software (SCHM) (Matlab/Perl software)
- NEOSSat Planning System (PLAN)
- NEOSSat FITS Processor (Java software)
- NEOSSat Image Cleaning suite (Python software)
- NEOSSat Image Statistics software (Perl software)
- NEOSSat Data Management system

MOC tools are provided “as is” and the Contractor is expected to provide only Level 1 and Level 2 maintenance. Level 3 maintenance and sustaining engineering is excluded from the scope of this contract.

(see APPENDIX 1 for mission Fact Sheet)

#### *3.1.2.4 M3MSAT*

Launched on 21 June 2016, the Canadian Maritime Monitoring and Messaging Microsatellite (M3MSat) is the latest of small-but-mighty spacecraft sent to test innovative technologies in space before they're deployed on full-scale missions. The mission aims to improve Canada's space-based capabilities to detect ships and manage maritime traffic. It is also testing a sensor that could change the way health and safety of satellites are monitored.

M3MSat's main payload is an AIS antenna with advanced capabilities that delivers higher performance for identification and conflict resolution of the signals. The compact antenna was designed by the University of Waterloo.

Since launch, M3MSat has been circling the Earth from pole to pole at an altitude of 505 km. It travels over Canadian waters approximately ten times a day. The satellite is owned by the Department of National Defence (DND) and operated from CSA. AIS data is downloaded on C-Band directly to commercial partners’ ground receivers for integration with AIS data from other sensors in their fleet.

Flight Operations for M3MSat consist of producing daily station contact times, validated timelines, flight dynamics products, telemetry analysis reports, and other reports, as well as executing passes to uplink commands, downlink data and troubleshoot anomalies. Data Management for M3MSat largely consists of ensuring successful delivery of the data to the users through the C-Band downlink. M3MSat task planning is largely performed by the end user, but schedules need to be properly ingested and uploaded using MOC tools.

MOC tools involved in M3MSat operations and used by the Contractor under the scope of this contract include:

- ITOS for spacecraft command and control, including mission-specific database
- M3MSat Flight Dynamics system (OAS)
- M3MSat Racksat
- Spacecraft Health Management software (SCHM) (Matlab/Perl software)
- M3MSat Planning System (PLAN)
- M3MSat Data Management system

MOC tools are provided “as is” and the Contractor is expected to provide only Level 1 and Level 2 maintenance. Level 3 maintenance and sustaining engineering is excluded from the scope of this contract.
.

(see APPENDIX 1 for mission Fact Sheet)

#### *3.1.2.5 RADARSAT Constellation Mission (RCM)*

The RADARSAT Constellation is the evolution of the RADARSAT Program with the objective of ensuring data continuity from previous RADARSAT missions. It consists of three identical SAR Earth Observation satellites approximatively half the size of its predecessors RADARSAT-1 (which operated between 1996 and 2013) and RADARSAT-2 (in operations since 2008).

It was developed through Government investments in Canada’s world-leading capabilities in space-based SAR. The three-satellite configuration provides daily revisits (on average) of Canada's vast territory and maritime approaches, including the Arctic up to 4 times a day, as well as daily access to any point of 90% of the world's surface. The launch of the satellites took place on June 12, 2019. RCM is designed to provide effective solutions in maritime surveillance (ice, surface wind, oil pollution and ship monitoring), disaster management (mitigation, warning, response and recovery), and ecosystem monitoring (agriculture, wetlands, forestry, and coastal change monitoring).

Flight Operations for RCM consist of producing daily station contact times, validated timelines, flight dynamics products, telemetry analysis reports, and other reports, as well as executing passes to uplink commands, downlink data and troubleshoot anomalies. Data Management for RCM consists of order handling, data production and ensuring successful delivery of quality data products to the users.

MOC tools involved in RCM operations and used by the Contractor under the scope of this contract include:

- RCM Classified Network
- RCM Unclassified Network
- RCM Cross Domain Solution
- RCM Enterprise Messaging System
- RCM Information Technology System
- Spacecraft Control System (SCS) - ITOS for spacecraft command and control
- Spacecraft Control System (SCS) – Network Router
- RCM Flight Dynamics system (FD)
- RCM Simulator
- RCM Mission Planning System (MPS)
- Spacecraft Health Information software (SHIELD) (Perl software)
- Spacecraft Processing and Archiving (SPA) software
- On-board Table & Software Management (OTSM)
- Image Quality Subsystem (IQS), including related infrastructure such as precision transponders and corner reflectors (Section 3.2.4)
- Product Generation Subsystem (PGS)
- Order Handling Subsystem (OHS), which includes a capability to order archived RADARSAT-1 data
- Restoration and Archiving (RAS) Subsystem

MOC tools are provided “as is” and the Contractor is expected to provide only Level 1 and Level 2 maintenance. Level 3 maintenance and sustaining engineering is excluded from the scope of this contract.

The CSA was granted an Operating Licence (OL) by Global Affairs Canada (GAC), which provides the legislative framework through which RCM operation execution is granted to the CSA under the regulatory regime prescribed by the Remote Sensing Space systems Act (RSSSA). Non-compliance to the OL and RSSSA are subject to sanctions specified in the RSSSA (AD-02). Through the delegated execution of the work described herein in the operation of RCM, the Contractor and its subsidiaries will be performing controlled activities (Section 2 of AD-02) and duties requested under the law and in doing so, will be required to subscribe to their responsibilities regarding compliance to the RSSSA by way of a System Participant Agreement (SPA) established with the CSA. The SPA prescribes the contractor’s record keeping and reporting modalities under the RSSSA, and specifies that the GAC has the right to undertake inspections of the operational premises.

(see APPENDIX 1 for mission Fact Sheet)

### 3.1.3 Descriptions of Upcoming and Foreign Mission Support

#### *3.1.3.1 Future Missions*

Future missions are being planned and might be subject to the current Contract as per Description of Services through Task Authorization in Section 5 of this document, depending on timelines and agreements.

#### *3.1.3.2 Foreign Launch Support*

In addition to current and future Canadian missions, the CSA has some responsibility to occasionally support satellites and satellite launch campaigns from other space agencies. When these occur, tasks involving the Contractor will be specified in the scope of Services under Task Authorization as described in Section 5.

#### *3.1.3.3 Foreign Support for Sensor Data Inter-Comparison*

In addition to Data Services pertaining to current and future Canadian missions, the CSA is also active in the area of sensor inter-comparison with industry and agency partners, for the purposes of comparing mission data products from similar Canadian and foreign missions. Such work, if involving the Contractor, will be subject to a Service under Task Authorization as described in Section 5.

## 3.2 Facility Infrastructure Description

### 3.2.1 Multi-Mission Control Center Description

The CSA Multi-Mission Control Centre (MCC) also known as the Primary Control Facility (PCF), is located within the John H. Chapman Space Center (JHCSC) or CSA headquarters located at 6767 route de l’Aéroport, Longueuil (St-Hubert), Quebec.

Built in 1992, JHCSC is a four storey building with a floor area of nearly 30,000 metres-square and occupies a land area of 41 hectares. It houses the three main branches of the CSA, namely Space Exploration, Space Utilization, and Space Science and Technology, along with the agency’s administrative, financial, corporate, and policy departments.

The PCF itself is distributed in 2 operational areas:

- Control Rooms & Operational Area
- RCM Production Area

In addition, there is provision for the following:

- Office space

- Meeting Rooms
- Network
- Audio and Video
- Rest Area
- Other accommodations

#### *3.2.1.1 Control Rooms & Operational Area*

The MCC Operational Area is divided into two areas: an unclassified operational area which contains office spaces, unclassified spacecraft activity planning workstations, a conference room and staff facility, and a larger secure area which contains the two control facilities, classified office space, equipment rooms, workshops, production rooms, and conference rooms. The space is zoned such that personnel flow from a public zone (main entrance to JHCSC) to a restricted zone (JHCSC proper) before obtaining access to the MCC's Operational zone, and subsequently to the MCC's Secure zone, with security checks and access requirements progressively increasing along the way. Personal electronics, including USB drives, laptops, cell phones, smart watches and key fobs are not permitted to enter or exit the MCC Secure zone. Table 3-1 provides a short description of the rooms in this area.

**Table 3-1 Control Room and Operational Area Rooms**

| Room | Size (m^2) | Access | Office Spaces | Network Classification (up to) |
|---|---|---|---|---|
| **Multi-mission Meeting Room** | 34.8 | Operational | | Unclassified |
| **Space Debris Analysis** | 9.0 | Secure | | Classified |
| **RCM LEOP** | 66.3 | Secure | 18 desks | Classified |
| **RCM Planning** | 37.2 | Secure | | Classified |
| **RCM Control Center** | 93.2 | Secure | 2 desks | Classified |
| **Multi-mission Control Center** | 93.0 | Secure | 2 desks<br>1 cubicle | Unclassified |
| **Multi-mission Planners** | 32.6 | Secure | 7 desks | Unclassified |
| **Supervisor Office** | 12.2 | Secure | 1 Closed Office | Unclassified |
| **Equipment Room** | 66.6 | Secure | | Classified |
| **Maintenance Room** | 33.8 | Secure | 4 desks | Unclassified |
| **Workshop** | 15.0 | Secure | | Unclassified |
| **Equipment Storage Area** | 49.0 | Secure | | Unclassified |
| **RCM ITS** | 22.7 | Secure | 2 cubicles | Classified |
| **RCM Production** | 23.2 | Secure | 2 cubicles | Classified |
| **Telco & Networking** | 14.3 | Secure | | Classified |
| **RCM Staging** | 47.7 | Secure | 4 cubicles | Classified |
| **RCM Meeting Room** | 63.8 | Secure | | Classified |
| **Corridor** | 157.6 | Secure | | N/A |
| **Staff Facilities (kitchen)** | 47.8 | Operational | | Unclassified |

#### *3.2.1.2 RCM Production Area*

The RCM Production Area is located is a separate secure area of the JHCSC. Infrastructure and network are provided to operate the RCM data management systems, namely the Order Handling System (OHS), Reception and Archiving System (RAS), Product Generation System (PGS), and Image Quality System (IQS). Government RADARSAT-2 Data Services are also delivered from this area.

#### *3.2.1.3 Office space*

As per Table 3-1, within the MCC Operational Area, office spaces will be provided to the Contractor, mainly in Multi-mission Planners room, as well as few desks in RCM ITS and RCM Production rooms. The numbers shown are indicative only and do not suggest any requirement in the size of the Contractor's operational team, but express an infrastructure constraint.

Outside the MCC Operational Area, office spaces will be provided to the Contractor in the RCM Engineering room and Multi-Mission Engineering room, up to 19 cubicles and 2 closed offices for managers as per Table 3-2. Office space is also available in the RCM Data Production Area, up to 5 corner offices.

**Table 3-2 Office Areas**

| Room | Size [m^2] | Access | Office Spaces | Network (up to) |
|---|---|---|---|---|
| **Alternate Conference Room** | 20.8 | Operational | 0 | Unclassified |
| **RCM Engineering** | TBC | Operational | 9 Cubicles | Unclassified |
| **Multi Mission Engineering** | 112.6 | Operational | 10 Cubicles<br>2 Closed Offices | Unclassified |
| **RCM Data Production and Radarsat-2 Government Data Services** | 45 | Operational | 5 Cubicles | Unclassified |

Office spaces are provided with these inclusions:

- Drawers and overhead cabinets
- CSA Corporate Windows PC and monitors connected to the CSA corporate network
- Personal corporate phone (landline)

Specific roles may be provided with an additional terminal for access to specific networks.

Any specific requirements to accommodate for limited mobility accessibility or ergonomics will be reviewed on a case by case basis, with appropriate justifications, by the CSA department of Security & Facilities.

#### *3.2.1.4 Meeting Rooms*

Within the MCC, there are two meeting rooms available (Multi-Mission Room and RCM Meeting Room), dedicated to Satellite Operations.

Besides those two dedicated rooms, other meeting and conference rooms can be made available across the JHCSC through the appropriate booking procedure via the corporate calendar tool.

#### *3.2.1.5 Network*

There are several physical networks within the MCC and they are listed in Table 3-3.

**Table 3-3 List of MCC Physical Networks**

| Network Name | Description | Classi-fication | Admin Respon-sibility |
|---|---|---|---|
| **CSA Corporate** | For usual CSA corporate and office activities with access to emails, intranet, inter-departmental platforms, etc. | Unclassified | CSA IT / SSC |
| **SatOps** | Protected behind a firewall, it is the primary point of entry to all satellite operations activities. It is used to connect all operational systems and antennas, and is used for all operational products related to small missions as well as operational CM structure. | Unclassified | Contractor |
| **RCM Unclass**[2] | Within the SatOps network, and protected behind another layer of firewalls, it is used to connect all unclassified RCM systems, and is used for all unclassified operational products related to RCM. | Unclassified | Contractor |
| **RCM Class**[2] | Protected behind the Cross Domain System (CDS), it is used to connect all classified RCM systems including the Telemetry and Commanding, and is used for all classified operational products related to RCM. | Classified | Contractor |

The network infrastructure is composed of fibre and copper lines. Network infrastructure is subject to strict security policies regarding implementations and modifications in order to isolate unclassified and classified networks, prevent misuse and tampering, and protect each network with the appropriate security measures.

#### *3.2.1.6 Audio and Video*

Within the MCC, there is a centralized audio-video system to route and display operational pages and information from various sources to large monitor display arrays in the two control rooms and in four other meeting and engineering rooms. This system is flexible depending on mission contexts and allows to share vital and time-sensitive information to operators and engineering personnel.

In addition, there is an operational voice communication system (CLEARCOM) allowing multi-level multi-channel communication between all critical operational workstations within the MCC and outside through voice loops and configured channels.

#### *3.2.1.7 Rest Area*

In order to accommodate operational personnel with limited rest times between satellite contacts or on evening and night shifts, there is a kitchenette area provided with amenities (rest rooms, lockers, fridge, coffee makers, etc).

#### *3.2.1.8 Other accommodations*

- Parking is free of charge at JHCSC but vehicles must be registered with Security;
- City buses (from RTL) run from and to JHCSC every 15 minutes on regular workdays;

[2] RCM Unclass and RCM Class are actual sets of physical networks, with their own management, test, and operational segments

- Wifi access to CSA network is not available on site. Temporary visitors may however request temporary access to a visitor wifi network;
- Cellular coverage is average to good on site, depending on the provider;
- A large cafeteria is serving breakfasts and 3 choices of noon main dishes on regular work days; Vending machines are also available;
- A fitness center is also available, with a squash court, a badminton court and seasonally offering yoga classes.

### 3.2.2 Backup Control Facility Description

The Backup Control Facility (BCF) is a duplicate of the critical RCM Telemetry & Commanding capabilities of the PCF. It is meant to be activated in the event that the PCF is not accessible and that the operations necessary to maintain the safety and health of the spacecraft must be moved. It is located at CSA's David-Florida Laboratory, Ottawa, Ontario.

#### *3.2.2.1 Usage*

On a monthly basis, the BCF workstations and servers are brought in synch with the PCF, as per the nominal Flight Operation procedures for RCM, subject to the Work described in Section 4.1.

### 3.2.3 Ground Station Network

#### *3.2.3.1 Canadian Ground Stations*

The Canadian ground station network consists of 5 station sites having each one or more large tracking antennas. They are operated by NRCan and DND and their specific names and locations are:

1. NRCan's Gatineau Satellite Station (GSS), Cantley, Quebec,
2. NRCan's Prince-Albert Satellite Station (PASS), Prince-Albert, Saskatchewan,
3. NRCan's Inuvik Canadian Satellite Facility (ICAN), Inuvik, North-West Territories,
4. DND's Polar-Epsilon-2 Aldergrove X-band reception antenna (CAAL), Aldergrove, BC, and
5. DND's Polar-Epsilon-2 Masstown X-band reception antenna (CAMA), Masstown, NS.

Figure 2 shows the location and coverage of each Canadian ground station. Examples of ground tracks for one day, one satellite, are shown in green in Figure 2. The antenna footprint mask is set at 5° minimum elevation angle for each of these five (5) Canadian stations as shown on the figure.

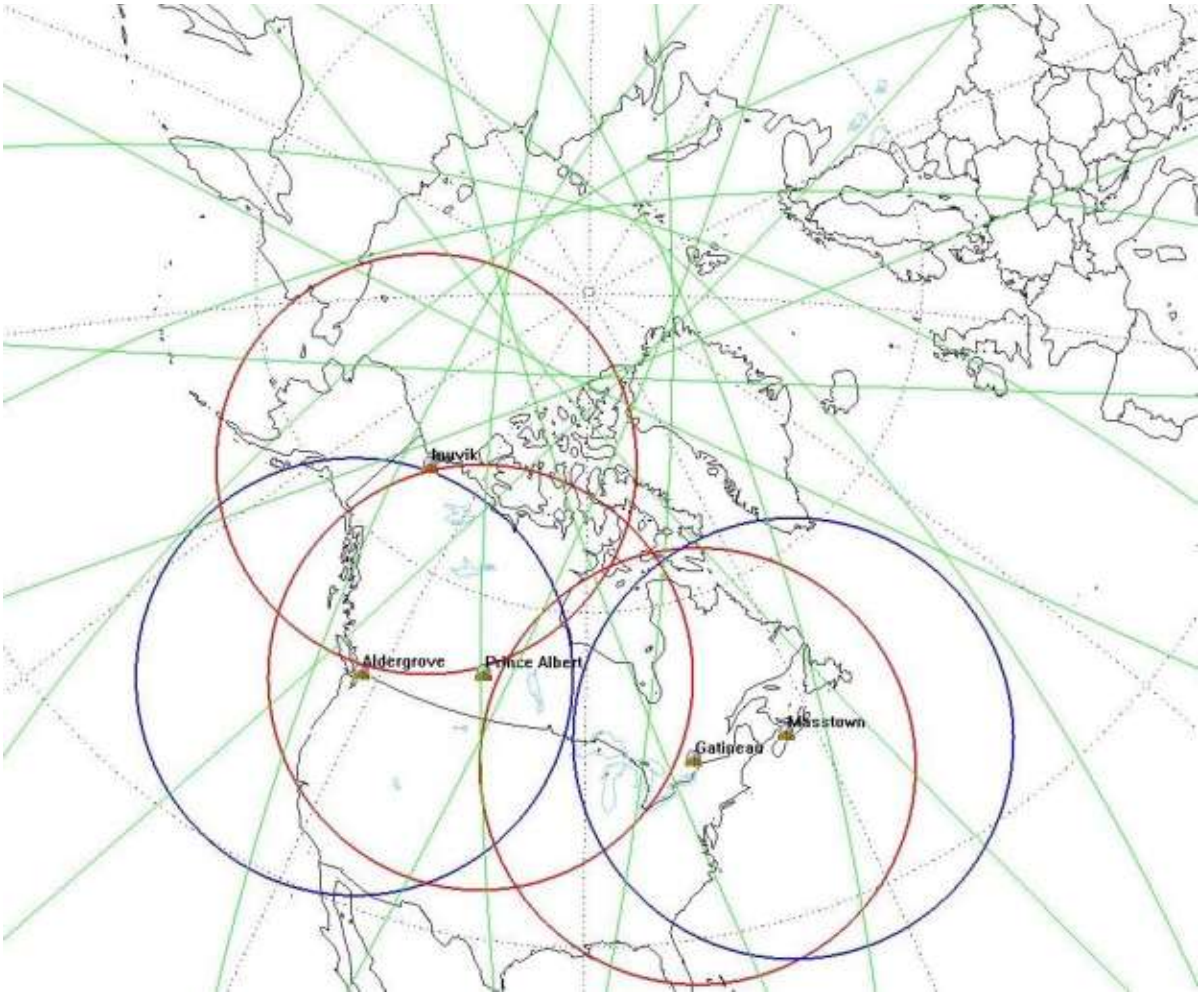



**Figure 2 RCM Canadian Ground Station Footprints**

Managed by various government departments, access to these stations is considered GFE.

#### *3.2.3.2 Other Commercial and Foreign Ground Stations*

Additionally to this Canadian network, through other contracts and agreements managed by CSA, other commercial and foreign antennas provided as GFS are used to expand the network as required. They include, but are not limited to:

1. MDA's St-Hubert TT&C S-Band antenna (SHUB) in Longueuil (St-Hubert), Québec
2. MDA's Saskatoon TT&C S-Band antenna station (SASK) in Saskatoon, Saskatchewan,
3. NASA's Alaska Satellite Facility (ASF), Fairbanks, Alaska,
4. SSC Esrange Satellite Station (KRN), Kiruna, Sweden,
5. SSC Santiago Satellite Station (SAN), Santiago, Chile.

In the event that access to those antennas is no longer available, the CSA will advise on how to proceed and transfer activities to other antennas.

#### *3.2.3.3 Antenna fact sheets*

Typical ground station antennas are large size dishes (5 to 13m) equipped with LEO satellite tracking capability and with either or both S-band duplex and X-band reception antennas.

### 3.2.4 Calibration Facilities

For the purposes of SAR sensor calibration monitoring of the RCM satellites, CSA has two calibration facilities located in the vicinity of the JHCSC, one on CSA premises, and another on a nearby farmland. Each of the facilities is equipped with a set of transmit and receive antenna arrangement system known as precision transponder, or active radar calibrator. Each of these transponders amplify and retransmit the received radar signal emitted by the RCM when one of its SARS illuminates the area. The transponder's retransmitted signal is calibrated, visible on SAR images, analyzed for calibration purposes.

Operation and maintenance of these instruments for RCM, as well as partner missions, is within the scope of the Work.

CSA also owns and controls two other calibration facilities outside Canada (Alaska, USA and Kiruna, Sweden), where passive radar reflectors are deployed for the purposes of sensor image calibration. Maintenance of this equipment is performed through separate contracts between the CSA and on-site partners.

### 3.2.5 Government Furnished Equipment and Services

The following are considered Government-Furnished Equipment and Services (GFE) throughout the Contract period:

- MOC Facility Infrastructure in St-Hubert (Section 3.2.1) and DFL (Section 3.2.2) (Building, HVAC, office space),
- TT&C and Antenna Access services (See Section 3.2.3 for description and Section 4.3.2 for applicable requirements),
- Antenna Reservation System (ARS) (See Section 4.3.1 for applicable requirements),
- Live Schedule Board displaying the scheduled satellite contacts and activities,
- Wide-Area Network (WAN) services connecting various facilities,
    - Although the WAN is maintained and operated by Shared Services Canada (SSC), the Contractor will have to respond to outages and report on service issues. (Section 4.3.3 for applicable requirements)
- Conjunction Risk Assessment and Mitigation System (CRAMS),
    - Although CRAMS is maintained and operated by CSA, the Contractor will receive the CRAMS reports and, for missions with propulsion, must execute collision avoidance (COLA) processes as required. (See Sections 1.4.3 for description and 4.1.3 for applicable requirements)
- Calibration Facilities (See Section 3.2.4 for description and Section 4.2.4 for applicable requirements), and
- Mission-specific Flight Operation and Data Management hardware, software and procedures as applicable (See Section 3.1.2 participating mission component descriptions and Section 4 for applicable requirements).

Also, within the MCC Operational Area, there is a workshop equipped with standard tools and test equipment in order to conduct basic maintenance and troubleshooting on hardware systems.

CSA will establish or approve the policies, procedures, and priorities supporting the successful completion of each task, and evaluate the results.

CSA will provide access to all necessary tools, including operational system elements and operational database, to perform the Work. These tools will be made available “as is” and in a condition suitable to be used for Operations. The Contractor may choose to use other tools as long as all operational requirements are met, applicable procedures are updated/approved and CSA agrees in writing. Any new tools developed in this course of this contract will be Foreground Intellectual Property (FIP) and CSA-owned.

The CSA does not furnish any equipment for work the contractor would perform outside the operational sites mentioned in Section 1.3.

## 3.3 Security

### 3.3.1 Physical Security

Physical security is provided through a number of measures. CSA security staff, working in coordination with other government departments, have developed an extensive security plan. Site security and site access are provided by a perimeter fence which contains a single point of access from which personnel can ingress and egress. Commissionaires operate the gate and identify all incoming personnel through visitor clearance requests or through RFID card authentication of employees.

Access to the building occurs through two main entrances. Each uses an RFID-authenticated automated turnstile or baffle gate. Commissionaires patrol each entrance and a receptionist is present at the main entrance during business hours. Operation zones within JHCSC are accessed through an extensive RFID keypad access system, and access authorities are based upon need-to-know and job requirements on an individual basis.

In addition to controlled accesses, the whole facility is on tight RFID access monitoring and camera video surveillance.

### 3.3.2 Personnel Security Clearance

Personnel will be granted security access to operational zones and security zones depending on their need to know and access. However, they must hold the appropriate security clearance for the given zone. All individuals not holding the appropriate security clearance will be required to be escorted and kept under oversight at all times within a restricted zone.

The personnel security requirements for this work are captured in the Security Requirement Check List (SRCL). As a note, the personnel screening process to obtain appropriate security clearance may require some time to complete.

Therefore, it is important that new personnel initiate the screening process as early as possible with the Government in order to give them their operational status early on and minimize the latency and escorting cost overheads.

### 3.3.3 Security Procedures

After obtaining security clearance, and in order to be granted access to the MCC Operational Area, personnel have to follow strict security procedures, as well as taking a Security Briefing.

In addition, there are special considerations to be aware of, and to follow in order to work with classified systems and information within the secure environment of the MCC:

1. RF and wireless transmission devices are strictly prohibited within the designated secure areas. The list of prohibited devices includes but is not limited to:
    a. Laptops,
    b. Smart phones, mobiles, ipods, electronic tablets,
    c. Digital car keys and remote starters,

d. Radio receivers and GPS,

e. Smart fitness devices (heart beat monitors, AppleWatch, MP3 players, etc.),

f. PCs;

2. Other electronic devices must be individually scanned, labeled and registered to be allowed to enter the zone:

   a. USB keys,

   b. Pagers,

   c. Maintenance tools;

3. Identification through RFID card is mandatory every time and for everyone entering or leaving the secure areas.

## 4 Description of Mandatory Work

This section on the Mandatory Work describes mandatory Services that the Contractor must fulfill and this Work will be treated through the Firm-Fixed Price (FFP) process.

In addition, the following activities are described in relation to specific deliverables required by this SOW. The Deliverables and Contract Data Requirements List (CDRL) as well as their associated Data Item Description (DID) can be found in APPENDIX 2 and APPENDIX 3, respectively.

CSA will make available all applicable and reference documents required to perform the work, but the Contractor must take necessary steps to protect data and information. A Non-Disclosure Agreement (NDA) may be required in order to obtain some reference documents, as specified in the Request for Proposal (RFP) document Part 1: GENERAL INFORMATION. The NDA extends to all subcontractors that may be involved in the work.

These activities are conducted in accordance with established and approved procedures. Using applicable configuration management processes and with the written concurrence of CSA, procedures may be updated to improve operational efficiency and/or throughput.

[REQ-001] According to procedures established or approved by CSA, and using appropriate elements of the operational systems and tools provided or approved by CSA, the Contractor must provide Services to cover all required activities, further detailed below, in the following areas of expertise[3]:

1. Flight Operations,
2. Data Management, and
3. Ground System Operations and Maintenance

such as to maximize delivery on mission objectives (Section Background 1.1). Using applicable configuration management processes and with the written concurrence of CSA, procedures may be updated to improve operational efficiency and/or throughput.

[REQ-005] The Contractor must be ready to accept decrease of service volume over time, as the context of operating EO Satellite missions poses the inherent risk that operation activities and data demand may reduce due to mission operations evolution, decreased system reliability or availability, or system failure(s) and evolution of user needs, which all influence service needs and data demand volume.

The operations load baseline for planning purposes is shown in the following table. These numbers may vary based on mission priorities and operational requirements.

**Table 4 Operations Load Baseline**

| Mission | Satellite TT&C | Data reception |
|---|---|---|
| **SCISAT** | 4-7 pass/day (S-Band) | 12 pass/day (S-Band) |
| **NEOSSat** | 4 pass/day (S-Band) | Included in TT&C |
| **M3MSat** | 3 pass/day (S-Band) | Only schedule planning for C-band downlinks directly to users |
| **RCM** | 4 pass/day/spacecraft (S-Band) | 12-15 pass/day/spacecraft (X-band) |

[3] As per Definitions Section 1.4.1

[REQ-010] The Contractor must deliver, monitor and control the Key Performance Indicators as agreed in the Service Level Agreement (SLA) [AD-01].

### 4.1 Flight Operations

[REQ-100] The Services must include:

1. Spacecraft Activity Planning and Contact Operations,
2. Satellite Health Maintenance, Monitoring and Control,
3. Orbit Maintenance, Monitoring and Control, and
4. Flight System Configuration Management.

#### 4.1.1 Spacecraft Activity Planning and Contact Operations

[REQ-110] The Contractor must prepare and conduct real-time operational activities required to communicate with the satellite during coverage periods of the antenna, including:

1. Activity Planning and Scheduling;
2. Operational Product Generation and Distribution;
3. Real-Time Pass Operation.

*The operational load baseline is presented in Table 4. The contacts, typically 8-12 minutes long, can be scheduled at any time during a 24 hour day based on priorities. The Contractor is responsible for configuring contact schedules, subject to CSA constraints and priorities.*

##### *4.1.1.1 Activity Planning and Scheduling*

[REQ-111] Based upon user demands provided by the CSA, and orbit-related Operational Products generated in Orbit Maintenance, Monitoring and Control (Section 4.1.3), the Contractor must assemble plans and schedules for real-time activities of all elements of the operational system as per Table 4. Activity planning and scheduling includes:

1. Payload command data files for direct ingestion to the scheduling system;
2. High-level sequences of events; and
3. Other forms of input as defined for each mission.

[REQ-112] As part of the process of approving the schedule of operational activities, and in order to ensure schedule coordination with other operational groups involved in the mission, the Contractor must hold a Weekly Operations Scheduling Meeting (WOSM) where the CSA representatives will be invited. This meeting will review and record decisions on status of previously scheduled activities, and will detail planning for future activities.

[REQ-113] As output to the WOSM, the Contractor must prepare a report in the format outlined in Periodic Reporting (Section 6.2.5) and deliver it to the CSA.

##### *4.1.1.2 Operational Product Generation and Distribution*

[REQ-115] Based upon the orbit-related Operational Products produced in Orbit Maintenance, Monitoring and Control (Section 4.1.3), the Contractor must generate operational products required to execute the satellite plans and schedules generated in Activity Planning and Scheduling (Section 4.1.1.1), review them for validity in the context of system constraints, and distribute them to the appropriate system elements for their execution during real-time satellite contacts at the TT&C antennas.

#### *4.1.1.3 Real-Time Pass Operation*

[REQ-117] Based upon Operational Products produced in Operational Product Generation and Distribution (Section 4.1.1.2), the Contractor must conduct prescribed activities for communication with the satellite during real-time contacts at TT&C antennas, including:

1. Pre-pass flight system configuration and communication checks;
2. Real-time upload of telecommand files, reception and monitoring of real-time telemetry;
3. Reception and distribution of down-linked data files, including, typically, on-orbit stored telemetry data, tracking data, and payload instrument data;
4. Hand-over of control between stations as required;
5. Post-pass system re-configuration, post-pass processing and operation logging.

### 4.1.2 Satellite Health Maintenance, Monitoring and Control

[REQ-120] The Contractor must undertake spacecraft health monitoring and control to ensure their health and safety, including tracking and reporting to the CSA in accordance with the operational procedures:

1. The spacecraft and flight system health reports on a daily basis; and
2. Health trending reports on a monthly basis.

[REQ-122] The Contractor must provide on-site satellite controllers 24 hours per day, 7 days per week to:

1. Examine telemetry data provided by the real-time control system, identify any unexpected or abnormal spacecraft sub-system status or performance as indicated by this data, and instigate escalation as per procedures;
2. Respond to telephone or email enquiries and notifications, from mission users, service providers or operational personnel undertaking Spacecraft Activity Planning and Contact Operations (Section 4.1.1), regarding potential abnormal status or behaviour, prepare any Level 1 and Level 2 maintenance responses as applicable according to baseline procedure to recover operations based on the correct response to the observed behaviour;

[REQ-125] The Contractor must provide on-call expert 24 hours per day, 7 days per week to:

1. Examine real-time and back orbit telemetry data to identify the root cause of any unexpected or abnormal spacecraft sub-system status or performance;
2. When necessary and depending on the anomaly level, implement recovery procedures, and/or escalate issues through the operational chain of command, including, as required, notifying the CSA on-call representative of anomalous behaviour, and recommended corrective measures;
3. When warranted by operational procedures, or as requested by the CSA, schedule, conduct, and record the minutes of meetings to brief the CSA and team members on the nature, status, risks, and recovery planning related to anomalous satellite behaviour; follow-up on action items and schedule follow-up meetings as required; and
4. Review the suitability of operational system elements to on-going spacecraft health, recommend appropriate changes, and implement approved changes.

### 4.1.3 Orbit Maintenance, Monitoring and Control

[REQ-130] The Contractor must monitor and, if required, control the orbit of the satellite, and produce and distribute Operational Products related to the orbit state by:

1. Process tracking data provided by the TT&C antennas and from the spacecraft navigation system;
2. Determine and predict the orbit state, and produce other Operational Products related to the orbit state;
3. Monitor the orbit against specified constraints, and identify required correction manoeuvres for those satellites possessing orbit correction capability;
4. Planning, executing, and evaluating orbit correction manoeuvres, and report to the CSA on the results;
5. Analyse and trend propulsion system performance and report periodically;
6. Respond to COLA events according to approved COLA response procedure, which includes rapid notification to an on-call specialist about dangerous conjunctions (high probability and/or small miss distance) requiring rapid analysis and potentially rapid response.

#### 4.1.4 Flight System Configuration Management

[REQ-140] The Contractor must monitor the status and health of all on-board sub-systems throughout the mission and study specific issues, and recommend configuration changes to the CSA. Specific tasks include but are not limited to:

1. Review telemetry plots and other products produced routinely from Spacecraft Activity Planning and Contact Operations (Section 4.1.1);
2. Verify that the status, configuration and health of all flight sub-systems is nominal (e.g parameters within boundaries, no warnings), and identify any abnormalities or anomalies, notifying the CSA of their existence and nature using databases established for this purpose; for time-critical situations, notify CSA using the applicable on-call processes.
3. Investigate the cause and criticality of abnormalities, and produce documentation with specific recommendations for flight trials and/or software updates;
4. Recommend changes in flight sub-system configuration required to resolve abnormal behaviour, or improve performance and seek the CSA approval to implement these changes;
5. Undertake Spacecraft Activity Planning and Contact Operations (Section 4.1.1) required to implement approved changes;
6. Prepare technical reports describing the results of such operations;
7. Provide services for:
   a. Configuration and Data Management (CADM) as per Section 4.3.5.1;
   b. Participate in Change Management Boards as per Section 6.2.3.

### 4.2 Data Management

[REQ-200] The Services must include:

1. Payload Data Order Handling and Acquisition Planning,
2. Payload Data Reception, Processing and Delivery,
3. Payload Data Product Quality Control,
4. Mission Reporting Support,
5. Data Systems Configuration Management, and
6. International Charter Space and Major Disasters Operations Support.

### 4.2.1 Data management work demand per mission

At this time, it is assumed that most GC users will have transferred their data demand from RADARSAT-2 to RCM by contract award. Therefore, while the effort related to RCM work is assumed to be continuous and operational, the required effort related to RADARSAT-2 work is estimated to be intermittent, and mostly related to managing data demand from the RADARSAT-2 archives, and for the purposes of RADARSAT-2 data consumption reporting for the Government of Canada. The Government of Canada operations with respect to RADARSAT-2 include work in Services 1. and 4. and 6. of REQ-200 above. The level of effort with respect to the data management services for RADARSAT-2 is estimated to be at most 10% of the effort required to operate data management services for RCM.

At this time, referring to the descriptions of current missions of section 3.1.2, the scope breakdown of the work related to Data Management requirements is as follows:

**Table 5 Applicable Data Management Requirements for RADARSAT-2 and RCM**

| Services | RADARSAT-2 | RCM |
|---|---|---|
| **Payload Data Order Handling and Acquisition Planning** | REQ-210: 1.2.3.4. only<br>REQ-212: 1. only<br>REQ-213: 1.3.5.6 only<br>REQ-214<br>REQ-215<br>REQ-216 | REQ-210: 2.3.4.5. only<br>REQ-211<br>REQ-212<br>REQ-213<br>REQ-214<br>REQ-215<br>REQ-216<br>REQ-217 |
| **Payload Data Reception, Processing and Delivery** | | REQ-220<br>REQ-221<br>REQ-222<br>REQ-223<br>REQ-224 |
| **Payload Data Product Quality Control** | | REQ-230<br>REQ-231<br>REQ-232<br>REQ-233 |
| **Mission Reporting Support** | REQ-240: 4. only | REQ-240 |
| **Data Systems Configuration Management** | | REQ-250 |
| **International Charter Space and Major Disasters Operations Support** | REQ-260 | REQ-260 |

### 4.2.2 Payload Data Order Handling and Acquisition Planning

The Contractor is expected to carry out various operational tasks supporting the ordering, planning, and satellite resource management for EO data acquisitions for remote sensing satellite missions, especially to serve Government of Canada (GC) Clients in terms of their EO Satellite data orders.

These duties include coordination and planning of Canadian EO data contribution to initiatives such as the International Charter Space and Major Disasters [AD-03], Hurricane Watch, Disaster Watch, or the baseline acquisition planning of EO satellites operated at the CSA, known as Background Mission. These tasks then nominally are part of Acquisition Planning operations as described above.

These tasks are mainly delivered through the use of the Acquisition Planning Tool application (RADARSAT-2 only), Order Handling and Mission Planning subsystems, as well as Restoration and Archiving subsystems centralized at the CSA headquarters in Longueuil (Saint-Hubert).

[REQ-210] The Contractor must operate and maintain the order handling infrastructure in order to undertake routine as well as non-routine order handling activities, including the following tasks:

1. As required by EO mission(s), prepare, verify and submit data acquisition plans of user clients, and, as required, for special or thematic projects such as Disaster Watch, Hurricane Watch and Background Missions;
2. Facilitate order submission process, providing guidance to mitigate ordering conflicts or to optimize system capacity;
3. As needed, provide recommendations to the CSA on non-automated order conflict management tasks, by order coordination or by manual conflict resolution (favour granting) and seek CSA approval before proceeding;
4. Support management of user client account attributes related to the Order Handling Subsystem (OHS, or its equivalent subsystem depending on the mission);
5. Monitor the delivery status of completed data orders;

[REQ-211] The Contractor must operate and maintain the acquisition planning infrastructure in order to undertake routine as well as non-routine acquisition planning activities, including the following tasks:

1. Operate the Mission Planning System (MPS) to generate data acquisition and restoration schedules and transmit them to the system Restoration and Archiving Subsystem (RAS);
2. As required by mission(s), prepare fast-tasking requests for CSA approval, and submit fast-tasking request; operate the Mission Planning Subsystem (MPS) to support such fast tasking product generation and distribution;
3. In coordination with Flight Dynamics, minimize impact of orbit maneuver on scheduled imaging through operation of the Mission Planning Subsystem (MPS), as required;
4. Support the generation of spacecraft control schedules and transmit schedules (Spacecraft Activity Planning and Contact Operations, Section 4.1.1) to the Spacecraft Control System (SCS) including:
    a. Generating X-band station advance and daily reservation schedules;
    b. Generating Advance Reception Plan, Reception Schedules, decryption keys and transmitting them to receiving stations.
5. Support anomaly recovery, from an acquisition planning perspective to support anomaly recovery process;

[REQ-212] The Contractor must execute issue reporting and corrective activities including the following tasks:

1. Report issues, problems or anomalies related to the Order Handling Subsystem and infrastructure, using the issue reporting process in place, and recommend corrective measures;
2. Report issues, problems or anomalies related to the Mission Planning Subsystem and infrastructure, using the issue reporting process in place, and recommend corrective measures;
3. As approved and as requested by the CSA, implement Level 1 and Level 2 maintenance corrective measures;

[REQ-213] The contractor must carry out the following tasks in support of operational documentation and reporting of Payload Data Order Handling and Acquisition Planning Activities:

1. Prepare, review, update, maintain Order Handling operational documentation, including guidelines and procedures;
2. Prepare, review, update, maintain Acquisition Planning operational documentation, including guidelines and procedures;
3. Track data ordering usage; prepare and provide periodic report(s) and statistics, on order handling status and performance metrics;
4. As needed, prepare presentations, produce reporting material, and provide technical support (database maintenance, database queries, and database reports) required to report on production;
5. As requested, participate in operational meetings to report on system status and mission performance, or to communicate recommendations;
6. As requested, record, file and archive minutes of operation meetings. Produce drafts of meeting minutes for approval;

[REQ-214] In undertaking order handling activities, the Contractor must produce the following deliverables:

1. Acquisition plans;
2. Operational reports;
3. Presentation material;
4. Procedures and guidelines;
5. Meeting minutes.

[REQ-215] The Contractor must provide on-call support outside of nominal working hours, with a response time of less than 60 minutes from call time to order handling time.

Note: on-call duties may include, but may not be limited to: order client-initiated emergency response, other fast turn around orders (‘near real-time’), anomaly meetings.

[REQ-216] The Contractor must be able to operate and maintain the Order Handling Subsystem to receive and handle order handling requests during the prescribed working schedule:

1. Nominal working hours: 7:30 to 18:30 on workdays (subject to statutory holidays in local time zone);
2. On-call: 6:00 to 22:00, seven (7) days a week;

Note: working and on-call schedules are subject to change with evolution and development of mission operational needs.

[REQ-217] The Contractor must be able to operate the Mission Planning Subsystem to execute spacecraft and payload (acquisition & downlink) planning during a working schedule of:

1. Day shift of 8 hours, 7 days a week;
2. Evening shift of 8 hours, 7 days a week;
3. On-call 7 days a week for periods not on-shift;

Note: working schedule is subject to change with evolution and development of mission operational needs.

### 4.2.3 Payload Data Reception, Processing and Delivery

The Contractor is expected to carry out various operational tasks related to the reception of payload data, its processing to produce mission products that are ready for delivery to end users. Generally these tasks entail 4 functions: Reception, Restoration, Archiving, and Processing.

These tasks are mainly delivered through the use of Mission Planning, Restoration and Archiving, and Product Generation Subsystems located at the CSA headquarters in Longueuil (Saint-Hubert).

[REQ-220] The Contractor must undertake data reception and archiving activities in support of routine and non-routine image acquisitions, including execution of the following tasks:

1. From MPS, receive schedules which define the conditions of restoration of Payload Data;
2. Ensure reception and as required, decryption of (encrypted) transfer segments;
3. Assemble (decrypted) transfer segments into archive segments;
4. Transfer archive segments to the processor;
5. Transfer archive segments to the applicable long-term archive;
6. Retrieve requested archive segments from the applicable, unclassified long-term archive;
7. Receive catalogue browse images from processing, and produce catalogue metadata;
8. Transfer that metadata and browse images to the catalogue.

[REQ-221] The contractor must carry out the monitoring and execution activities related to long-term archive and archive restoration of payload data, including:

1. Insertion of received archive segments into the unclassified long-term archive;
2. Retrieval of requested archive segments from the unclassified long-term archive;
3. Generation of archive reports, and transfer of those reports to MPS;
4. Ensure problem reports from reception stations are received, and reported to the CSA.

[REQ-222] The contractor must execute activities related to Payload Data processing, including:

1. Receive and process production requests from the OHS or its equivalent subsystem depending on the mission;
2. Receiving definitive orbit data updates;
3. Receive archive segment associated with data product request. Archive segment can either originate from decrypted reception data, or from long-term archive;
4. Provide completed data products to the delivery manager component of the ground segment, and production result messages to the OHS;
5. Provide catalogue browse images to the archiving function;
6. Execute data product quality spot-verifications as required;
7. Deliver image quality reports to the Image Quality Subsystem (IQS), if applicable;
8. Receive and implement updates of processor configuration parameters from the IQS;
9. Track data product generation system usage on data production activities and status; prepare and provide periodic report(s) and statistics as prescribed or approved by the CSA.

[REQ-223] The Contractor must execute issue reporting and corrective activities including the following tasks:

1. Report issues, problems or anomalies related to the Payload Data Reception, Processing and Delivery, using the issue reporting process in place, and recommend corrective measures;
2. As approved and as requested by the CSA, implement Level 1 and Level 2 maintenance corrective measures.

[REQ-224] The Contractor must ensure operations of the Payload Data Reception, Processing and Delivery activities to receive Payload Data and generate Payload Data products during a working schedule of:

1. Day shift of 10 hours, 7 days a week;
2. Evening shift of 10 hours, 7 days a week;
3. On-call 7 days a week for periods not on-shift.

Note: working schedule is subject to change with evolution and development of mission operational needs.

### 4.2.4 Payload Data Product Quality Control

These operational activities pertains to the control and maintenance of quality, calibration and processing performance of payload satellite data, and data products, in particular for Earth Observation satellite missions. These requirements do not apply for SCISAT, NEOSSat, or M3MSat.

These activities are accomplished in part with the utilization of dedicated ground segment subsystems located at the CSA headquarters in Longueuil (Saint-Hubert), such as the Image Quality and Subsystem (IQS), and the Product Generation Subsystems (PGS), and ground equipment deployed off-site and controlled from Longueuil.

[REQ-230] The Contractor must undertake product quality control activities consisting in operational acquisition and analysis of imaging and non-imaging data products for the purpose of payload data product quality control, and maintenance of payload data calibration, and also including sensor payload model utilization and non-routine work required for the upgrade of the configuration of ground segment subsystems involved in image generation. Depending on the nature and sensing payload technology of the mission(s), this work includes the following tasks:

1. In collaboration with Payload Data Order Handling, prepare, coordinate, submit and track, as needed, calibration data acquisitions for data quality control purposes;
2. Receive and store data products needed for image quality control and calibration verification;
3. Issue special data processing orders such as for acquiring non-imaging products, to be utilized for monitoring sensing performance, or investigating, tracking and resolving data quality and calibration problems;
4. Perform performance analyses on received and processed data products, and measure data quality and calibration parameters to determine whether performance is within tolerances;
5. For data products analyzed, generate analysis result reports and, as required, store results into the IQS database;
6. Receive processing reports from the PGS, and extract into the IQS database the data relevant to data quality control and calibration maintenance;
7. Using records from the IQS database, track, analyze and report data quality and calibration result and performance; identify data quality and calibration parameter trends; characterize performance of sensor data acquisition modes and spacecraft payload performance as can be observed by the IQS;
8. From analysis results, statistics and trends, generate calibration reference data required for routine generation of data products, as needed;
9. As required by mission evolution and new benchmarks, update, maintain, enhance or adapt existing software for the IQS and its database;
10. Utilize the sensor payload model with the IQS to increase efficiency of overall calibration of the data acquisition modes that are available within the payload sensor;

11. Operate external calibration equipment deployed off-site;
12. Compute system parameter corrections pertaining to acquisition mode definitions, as well as payload and data processing configuration parameters, in order to adjust end-to-end performance of the payload data product generation system; provide such parameter sets to the proper subsystems, mainly the PGS and RAS.

[REQ-231] The Contractor must execute issue reporting and corrective activities including the following tasks:

1. Report issues, problems or anomalies related to subsystems operated for Payload Data Quality Control and calibration, including IQS and PGS, using the issue reporting process in place, and recommend corrective measures;
2. As approved and as requested by the CSA, implement Level 1 and Level 2 maintenance corrective measures related to subsystems operated for Payload Data Quality Control and calibration;
3. Coordinate and support the level 1 and level 2 maintenance of the external calibration equipment.

[REQ-232] The contractor must carry out the following tasks in support of operational documentation and reporting of Payload Data Quality Control and calibration Activities:

1. Prepare, review, update, and maintain Payload Data Quality Control and calibration operation documentation, including guidelines and procedures;
2. Collect and prepare the necessary information for operational meetings, as requested;
3. Prepare presentations, produce reporting material and provide technical support required to report on data product quality and calibration status and performance;
4. As requested, participate in operational meetings to report on data product quality and calibration performance, or to communicate recommendations;
5. As requested, record, file and archive minutes of operation meetings. Produce drafts of meeting minutes for approval;
6. Prepare and provide reports on data product quality and calibration status and performance.

[REQ-233] In undertaking product quality control activities, the Contractor must produce the following deliverables:

1. Image Products and Non-Imaging Products Analysis Reports (depending on the sensing payload technology of the mission(s));
2. Operational Reports;
3. Presentation Material;
4. Meeting Minutes.

### 4.2.5 Mission Reporting Support

The Contractor is expected to carry out various tasks related to the development, implementation and support to enforcement of applicable data policies and Science Data Access Control, to ensure national data security interests and implementation of operating license provisions under the Remote Sensing Space Systems Act (RSSSA) [AD-02]. These tasks include analysis and reporting on data access and sharing.

[REQ-240] The contractor must undertake Mission Reporting Support services in order to assist the CSA in upholding the application of the operating licences, which states the operating conditions of, and data access from, satellite missions under CSA SE. As such, remote sensing missions operated at the CSA operations require implementation, facilitation and operation of routine and non-routine reporting functions pertaining to payload data acquired, payload

data products generated, and disseminated (designated below as 'payload data access'), including the following tasks:

1. Operate routine and on-demand reporting tools (for example: programs and scripts) extracting data from ground segment subsystems involved in distribution of data from EO satellite missions operated by the CSA;
2. As needed, design, program and update operational scripts or software preparing the transfer of information on data access, data distribution, and data consumption residing in ground segment subsystem databases, to reporting tools;
3. From data extracted by the reporting tools, provide analyses for the purposes of cross-referencing, statistics and trending on topics such as payload data access, data distribution, data consumption;
4. Prepare report and presentation material from the payload data extracted and analyses produced;
5. Prepare, review, update and maintain documentation and procedures pertaining to payload data access reporting and analysis tools.

#### 4.2.6 Data Systems Configuration Management

[REQ-250] The Contractor must monitor the status and health of the payload data ordering, acquisition, processing and archiving chain. Through evolution of mission needs and the occurrence of specific issues, the Contractor is to recommend configuration changes to the CSA. Specific tasks may include:

1. Verify that the status, configuration and health of all Data Management sub-systems are nominal (e.g no warnings, parameters within boundaries), and identify any abnormalities, notifying the CSA of their existence and nature;
2. Investigate the cause and criticality of abnormalities, and notify the CSA;
3. As needed, produce documentation with specific recommendations with respect to system tests and/or software updates;
4. Recommend changes in Data management subsystem(s) configuration required to resolve abnormal behaviour or improve performance, and seek CSA approval and direction to implement changes;
5. Prepare technical reports, in CSA-approved format, describing the results of such operations;
6. Provide services for:
   a. Configuration and Data Management (CADM) as per Section 4.3.5.1;
   b. Participate in Change Management Boards as per Section 6.2.3.

#### 4.2.7 International Charter Space and Major Disasters Operations Support

[REQ-260] The Contractor must carry out activities to support to the CSA in the implementation of the Charter, including:

1. Assist validating applications of new Charter users for the Charter Board's review and approval;
2. Support to drafting official correspondence;
3. Support operational development by establishing, reviewing, and updating Charter minutes, policies, procedures, reports, document repositories and presentations;
4. Provide oversight of Charter activations:
   a. Monitor new and existing Charter activations and ensure that CSA is fulfilling its obligations to support these activations.

b. Provide a list of qualified Charter response managers from partner organisations based upon pre-defined criteria;

c. As required, designate a Charter response manager for disaster events covered by the Charter in the shortest possible time based upon the proposals received from partner organisations.

### 4.3 Ground System Operations and Maintenance

[REQ-300] The Services must include:

1. Antenna Reservation System Operation,
2. Telemetry, Tracking and Commanding System Operation,
3. Network and Communication System Operation,
4. Operational System Configuration Management, and
5. Administrative Services.

#### 4.3.1 Antenna Reservation System Operation

[REQ-310] Contractor must conduct antenna scheduling activities to produce an optimal antenna reservation schedule from mission requests/needs and antenna availabilities, and with respect to:

1. Contact criticality;
2. Mission priority;
3. Antenna preferences and costs; and
4. Schedule stability.

Tools mentioned in Section 3.2.5 like the Antenna Reservation System and Live Schedule Board are provided to help with this task.

#### 4.3.2 Telemetry, Tracking and Commanding System Operation

[REQ-320] Based upon the Operations Schedule, the Contractor must conduct prescribed TT&C activities for enabling communication with the satellite during real-time contacts, including:

1. Pre-pass TT&C system configuration and communication checks;
2. Baseband equipment operation and satellite link monitoring;
3. Hand-over of control between stations as required;
4. Post-pass system re-configuration, post-pass processing and operation logging.

The Contractor is encouraged to propose automation solutions in order to improve efficiency while maintaining contact reliability.

#### 4.3.3 Network and Communication System Operation

[REQ-330] Based upon the Operations Schedule, the Contractor must conduct prescribed network operations activities for ensuring communication with the ground stations during real-time contacts, including:

1. Pre-pass communication system configuration and communication checks;
2. Network equipment operation and link monitoring;
3. Hand-over of control between ground stations as required;
4. Operation logging.

The Contractor is encouraged to propose automation solutions in order to improve efficiency while maintaining system reliability.

#### *4.3.3.1 Network Operation & Monitoring*

[REQ-331] The Contractor must undertake responsibility for continual monitoring of the government operational networks, storage and computing infrastructure for all operational systems (as per Table 3-3 with the exclusion of CSA Corporate network), including:

1. Network performance monitoring
2. System components performance monitoring
3. Storage utilization monitoring and upkeep
4. Network intrusion monitoring
5. Security auditing
6. Vulnerability monitoring
7. Out-of-band monitoring, where applicable for sensitive infrastructure

[REQ-332] The Contractor must implement corrective measures for issues identified either by operators or by automated monitoring systems to limit impacts on satellite operations and timely data delivery.

[REQ-333] The Contractor must maintain Information Technology asset inventory for all hardware and software, including appliances, on the government operational networks. A baseline inventory will be provided at the start of the Work.

[REQ-334] The Contractor must exercise and maintain routine procedures related to secure cross-domain transfers of data elements between network security zones.

#### *4.3.3.2 Network Administration and Security*

[REQ-335] The Contractor must administrate all government operational networks within the MCC (as per Table 3-3 with the exclusion of CSA Corporate network which is the responsibility of CSA IT / Shared Services Canada) and in line with network security policies and procedures, including:

1. Storage and CPU provisioning (physical and virtual);
2. Managing and maintaining physical and virtual infrastructure components;
3. Management of routers, switches and firewalls;
4. Upkeep and deployment of anti-virus and malware protection systems;
5. Exercise routine system maintenance procedures;
6. Patching of operating system and COTS applications;
7. Reports related to security events, network traffic monitoring and logging;
8. COTS license administration;
9. Group Policy management;
10. Access control / User account administration;
11. Printers administration;
12. Configuring, moving and connecting all equipment to their designated networks, and updated applicable drawings under configuration control;
13. Physical and logical network configuration management;
14. Routine backups, archiving and retrieval;

15. Maintenance of software tools used for infrastructure management, including configuration repositories (e.g., SVN), issue tracking systems (e.g., Jira, Bugzilla), and knowledge databases (e.g., Confluence, Wikis); and
16. Deployment of new operational elements/upgrades from development environments into operations (sometimes automated via Salt or other scripts; other times manual).

[REQ-336] At all times, the Contractor must maintain the MOC infrastructure according to best security practices, knowing that an audit of vulnerabilities and security posture may be conducted at any time.

[REQ-337] The Contractor must perform routine synchronization of the RCM Backup Control Facility (BCF) to the latest operational configuration of the Primary Control Facility (PCF).

*Note: Travel authorization to be sought as per Section 6.3.1*

### 4.3.4 Operational System Configuration Management

[REQ-340] The Contractor must support the CSA with the on-going maintenance of the operational system baseline configuration, as defined in Section 3.2, including function, performance, and availability. These activities include:

1. Software Maintenance (Level 1 and Level 2 maintenance),
2. Hardware Maintenance (Level 1 and Level 2 maintenance),
3. Operational Database Maintenance (Level 1 and Level 2 maintenance), and
4. Operational System Administration and Security.

#### *4.3.4.1 Software Maintenance*

[REQ-341] The Contractor must investigate ground segment software anomalies, endeavour to isolate the causes, recommend appropriate changes to the CSA for approval, and (if authorized) implement approved changes in a timely manner.

The software maintenance will normally be restricted to Level-1 and Level-2 maintenance such as updating system configuration, installation, testing and deployment of software patches.

#### *4.3.4.2 Hardware Maintenance*

[REQ-342] The Contractor must undertake preventive and required corrective maintenance of system hardware, according to plans and procedures approved by CSA.

The level of hardware maintenance will normally be restricted to Level-1 and Level-2 maintenance such as line-replacement with shelf repairs and light shop work to perform repairs by replacing components of equipment.

#### *4.3.4.3 Procedure Maintenance*

[REQ-343] The Contractor must monitor performance and suitability of procedures, recommend to the CSA any changes required to resolve deficiencies, and implement the changes approved by the TA according to CSA procedures identified in under Configuration and Data Management (CADM) (Section 4.3.5.1).

#### *4.3.4.4 Operational Database Maintenance*

[REQ-344] The Contractor must undertake the necessary activities for maintaining current and correct versions of all elements of each mission's Operational Database, including:

1. In the course of Spacecraft Activity Planning and Contact Operations (Section 4.1.1), monitoring the suitability of operational procedures, and the resource levels they prescribe, in terms of satisfying function, performance, and availability requirements, and recommending improvements to these items;
2. In conducting Satellite Health Maintenance, Monitoring and Control (Section 4.1.2), monitoring the relevance and suitability of data files, operational procedures, and configuration records, and recommending improvements to these items;
3. In conducting Data Management (Section 4.2), monitoring the relevance and suitability of data files, operational procedures, and configuration records, and recommending improvements to these items;
4. In conducting Telemetry, Tracking and Commanding System Operation (Section 4.3.1), monitoring the relevance and suitability of data files, operational procedures, and configuration records, and recommending improvements to these items;
5. In conducting Network and Communication System Operation (Section 4.3.3), monitoring the relevance and suitability of data files, operational procedures, and configuration records, and recommending improvements to these items.

The operational database maintenance will be restricted to Level-1 and Level-2 maintenance.

[REQ-345] The Contractor must implement the approved changes arising from the Operational Database Maintenance as per Configuration and Data Management (CADM) (Section 4.3.5.1).

#### *4.3.4.5 Operational System Administration and Security*

[REQ-347] The Contractor must conduct routine operational system administration, according to CSA-approved plans and procedures, to maintain the required operational configuration of, and access control to, the operational system throughout the mission.

[REQ-348] These Operational System Administration and Security procedures may change from time to time, and whenever applicable, the Contractor must recommend and implement approved changes as required.

### 4.3.5 Administrative Services

[REQ-350] Using systems and procedures provided or approved by CSA, the Contractor must provide administrative services related to hosting of the operational system on the CSA premises, including:

1. Configuration and Data Management (CADM),
2. Facility Administration.

#### *4.3.5.1 Configuration and Data Management (CADM)*

[REQ-351] While following CSA's directives relating access control, the Contractor must provide support to manage the storage of all elements of the operational database, problem reporting and tracking for on-going problem management, and configuration control administration. These tasks include:

1. Maintain the depository of all pertinent technical data and documentation, accurately reflecting the configuration of the system at all times, and with access strictly controlled;
2. Maintain a record of problem reporting, which is accessible to CSA and Contractor operational personnel, and linked to the configuration control process;
3. Provide system configuration control administration throughout the mission;
4. Provide services for Configuration Management as per Sections 4.1.4, 4.2.6 and 4.3.4;

5. Participate in Change Management Boards as per Section 6.2.3.

#### *4.3.5.2 Facility Administration*

[REQ-352] The Contractor must:

1. Maintain and operate the Facility Help Desk (FHD), which is a central point of contact for CSA Satellite Operations personnel, keeping the FHD accessible via e-mail or telephone, provided by CSA and providing a responsive service in the operations office needs such as accommodation, commercial software management, office telephones and security clearance requests;
2. Maintain records of stored items, spares and consumable, noting their depletion rate and ensuring stock is maintained;
3. Record the cost and consumption rate of consumables, and report this information to the TA on a monthly basis.

# 5 Description of Services through Task Authorization

This section on Services under Task Authorization describes optional Services that may be requested to the Contractor, on an “as and when requested” basis, and will be treated through the Task Authorization Process.

[REQ-500] When requested by the CSA, the Contractor must provide additional services, as and when requested, further detailed below, including but not limited to the following:

1. Support to Ad-hoc Operational Activities,
2. Development of New Operational Capability,
3. Level-3 Facility Hardware Maintenance, and
4. Training.

## 5.1 Additional Task-Based Work

### 5.1.1 Support to Ad-hoc Operational Activities

[REQ-510] The Contractor must provide support to undertake certain operational activities (to be determined in a Task Authorization Request) related to ad-hoc operations. The Contractor should assign personnel already on site to fulfil operational objectives as described in Flight Operations (Section 4.1). This work may include but is not limited to:

1. Spacecraft Activity Planning and Contact Operations for :
   a. Proficiency (system compatibility or validation) and emergency contacts for other partner satellites (e.g., other space agencies, etc.);
   b. First acquisitions of launch vehicles and other partner spacecraft (e.g., other space agencies, etc.)

### 5.1.2 Development of New Operational Capability

[REQ-520] The Contractor must provide support to undertake certain technical activities (to be determined in a Task Authorization Request) related to development of operational capability for new mission in CSA. The Contractor should assign personnel already on site to fulfil operational objectives as described in Flight Operations (Section 4.1). This work may include but is not limited to:

1. Support to definition of operational requirements,
2. Participation in design, construction, and commissioning of new ground infrastructure such as antennas, mission control rooms and equipment rooms (with the exclusion of architectural work),
3. Support the development and integration of the operational database for new missions

### 5.1.3 Level-3 Facility Hardware Maintenance

[REQ-530] When requested by the CSA, the Contractor must support Level-3 hardware maintenance such as major new installations and modifications of elements of the ground infrastructure, including any and all elements of the facility hosting any portion of the operational system.

### 5.1.4 Training

[REQ-540] When requested by the CSA, the Contractor must provide operational training to allow the operations certification of government employees as well as personnel of a new service provider, should there be one, in accordance with the labour rates in the Contract Basis of Payment (BoP).

This potential requirement to have Contractor personnel train the personnel of a new service provider, should there be one, is crucial in enabling the continuance of the work in an effective and efficient manner, particularly in the matter of the safety of Canada's space assets and continuity of data services to the users.

## 5.2 Handling of Services under Task Authorization

### 5.2.1 Resource Allocation

[REQ-550] The Contractor must include in its proposal for each Task Authorization Request provided by the CSA the following:

1. Level of effort and labour category contained in the Task Authorization and specified in operational procedures;
2. Estimated time for completion;
3. Operational system tool and database elements.

For an approved Task Authorization, if the Contractor considers that the scope or the resource levels should change, the Contractor may propose such changes to the CSA for consideration. Any change to Task Authorizations will follow the procedures outlined in the Task Authorization process (as per RFP Part 7: RESULTING CONTRACT CLAUSES).

# 6 Operational Framework Requirements

## 6.1 Personnel and Organization Management

### 6.1.1 Personnel Management

[REQ-611] The Contractor must:

1. Ensure that all personnel meet the qualifications outlined in Section 6.3.5;
2. Ensure that all personnel are provided generic and mission-specific training to support CSA missions;
3. Provide an operational organization structure;
4. Provide a single interface with the CSA for contractual purposes (reception and approval of Task Requests).

### 6.1.2 Government Furnished Personnel

To ensure continuity of operations and knowledge transfer, the CSA will provide Government Furnished Personnel (GFP) to the Contractor in order to:

- Maintain efficient communication and collaboration between parties,
- Ensure a level of knowledge retention and transfer within the Government, and
- Maintain the Government's expertise in operations by offering government employees relevant Satellite operations experience.

The CSA will provide a total equivalent of 8 Full-Time Equivalent (FTE) each year for the duration of the Contract for the purpose of knowledge transfer.

Individual GFPs will each be dedicated to the Contractor team for a percentage of their time agreed between the CSA and the Contractor, and the Contractor will be responsible to assign tasks to them according to their skillset and agreed allocation.

GFP allocation and assignment level will be reviewed and agreed upon at Operations and Maintenance Readiness Review (OMRR, Section 7) and at every beginning of government fiscal year cycle by both parties (CSA and the Contractor) based on skillset demand and offer, and may cover only a portion of a year, whenever agreed so.

GFP assignments may be terminated by mutual agreement because of operational requirements or financial constraints, or if the CSA is of the opinion that GFP employee's performance is unsatisfactory or for personal reasons (for example, if a family member becomes seriously ill). A written notice of 10 working days is required in all cases.

While the work will be assigned by the Contractor, the GFP will continue to functionally report to their CSA supervisor.

The GFP will maintain their status as Public Service (PS) employee and will continue to receive all entitlements applicable to their occupational group as prescribed by the collective agreement and/or the appropriate Treasury Board Directive.

The GFP will continue to comply with the Canadian Space Agency Values and Ethics Organizational Code [AD-04] which clarifies expected behaviours that correspond to the values of our organization as well as those of the Values and Ethics Codes for the Public Service.

Should any concern arise at any time concerning GFP's assignment, the TA will be the point of contact for the CSA to receive comments and take corrective actions whenever required, including substitution of GFP to maintain the FTE level. Should any concern arise related to GFP relations with the Contractor team, the TA will interact through the Contractor's contracting agent.

[REQ-612] For GFP allocation and assignment level, as a whole, the Contractor must cover all major areas of expertise in satellite operations at all times (subject to CSA providing personnel with the appropriate skillset), namely:

1. Spacecraft systems,
2. Flight dynamics,
3. Mission planning,
4. Ground systems,
5. Order handling,
6. Image quality,
7. Data reception, processing and archiving,

[REQ-613] During the GFP assignment, the Contractor must:

1. ensure GFP integration and work coordination within its operational organization for the portion of work assigned by the Contractor, and foster collaboration,
2. assign tasks to GFPs according to their skillset and agreed allocation,
3. remain ultimately responsible and liable for all contract deliverables, regardless of task assignment to GFP or to their own staff,
4. offer the same responsibility and training opportunities (including on-the-job training) to the GFP pertaining its assignments as to any equally-qualified Contractor employee, and
5. provide formal feedback and inputs to the GFP and their CSA supervisor twice each government fiscal year cycle for the purpose of GFP performance appraisal; GFP may provide formal feedback to the Contractor on their assignments;

[REQ-614] At Operations Service Reviews (OSRs), the Contractor must report on successful achievement of the following GFP objectives:

1. Maintain efficient communication and collaboration between parties,
2. Ensure a level of knowledge retention and transfer within the Government, and
3. Maintain the Government's expertise in operations by offering government employees relevant Satellite operations experience;

### 6.1.3 Organization

[REQ-616] The Contractor must maintain an organization of qualified operational personnel designed to satisfy the requirements of the tasks described herein while:

1. Ensuring effective and cost-efficient supervision and administrative management;
2. Ensuring timely and reliable performance of personnel in undertaking the Work;
3. Ensuring reliable and effective reporting on operation and system maintenance, as per Section 6.2.5.

[REQ-617] The Contractor must prepare staffing plans as part of the Service Management and Implementation Plan (SMIP) (CDRL-01) for his duties under this Contract.

[REQ-618] The Contractor must notify CSA of staffing changes for key positions or functions covered by this SOW.

## 6.2 Operational Management

[REQ-620] The Contractor must work within the operational framework established in CSA for management of such work in the context of all missions. This includes:

1. Contractual Authorities,

2. Configuration Management ,
3. Change Management Boards,
4. Coordination Meetings, and
5. Periodic Reporting.

### 6.2.1 Contractual Authorities

For the purposes of this SOW, the following contractual authorities are described in Section 7.5 of the RFP document:

1. Contracting Authority (CA)
2. Technical Authority (TA)
3. Project Authority (PA)

### 6.2.2 Configuration Management Roles

CSA manages system configuration through a system of authorities responsible for the mission performance and system integrity. Each represents a role assumed by an individual in the context of technical operation and maintenance activities, distinct from that individual's roles in other contexts, and associated with the individual's position in the operational organization.

For the purposes of this SOW, the configuration management roles by CSA are:

1. Technical Representatives: are responsible to review and recommend approvals of proposed system and procedure changes to ensure fitness for operation. They also represent the stakeholders.
2. Management Representatives: are accountable for overall system integrity and operational performance, and the ultimate authority over the specified operational system or mission;
3. Safety & Mission Assurance (S&MA) Representatives are responsible to ensure that the system meet or exceed requirements for safety, performance and quality.

[REQ-621] The Contractor must provide lead roles and representatives for the purpose of operations coordination with the CSA Configuration Management roles. Those Contractor roles may be assigned to GFPs as per Section 6.1.2.

[REQ-622] In case of diverging arguments about operational matters, the Contractor must comply to CSA's directions provided by the Management Representatives. As the owner of the space assets, the Government is the final authority to protect Canada's interests.

### 6.2.3 Change Management Boards

To serve configuration management of the operational systems under CSA's purview, CSA has established various official boards to oversee system change control.

[REQ-623] The Contractor must attend and contribute to specified change management boards:

1. Anomaly Review Board (ARB): reviews anomaly reports, and plans and approves from a technical viewpoint the proposed anomaly response for all applicable CSA systems and missions in accordance with operational procedures. Unless dictated by the CSA, the ARB is chaired by the Contractor. CSA has approval rights of the ARB disposition;
2. Issue Review Board (IRB): reviews, prioritizes, and assigns problem reports and enhancement requests, authorizing technical experts to work on changes. Changes initiated through IRB are only deployed into operations following approval by CCB. The IRB members include representatives from CSA and the Contractor. Unless dictated by the CSA, the IRB is chaired by the Contractor;

3. Configuration Control Board (CCB): formally approves all system changes, raised in either context above, as complying with the CSA policies and procedures on configuration control. The IRB members include representatives from CSA and the Contractor. Unless dictated by the CSA, the CCB is chaired by the Contractor. CSA has approval rights of the CCB disposition.

[REQ-624] The Contractor must provide representatives for all Change Management Boards, including chairs unless assigned to CSA personnel by the CSA.

### 6.2.4 Coordination Meetings

To help activity coordination between CSA and the Contractor, CSA has established various specified coordination and review committee meetings.

[REQ-625] The Contractor must attend and contribute to specified coordination and review committee meetings:

1. Weekly Operation Scheduling Meeting (WOSM): ensure coordination and scheduling of satellite activities for all missions. The OA chairs the WOSM.
2. Mission-specific weekly operations meetings: These meetings, which may involve the end-user / client of a mission's data, focus on mission-specific activities and performance and are chaired by government personnel representing the user of the mission. Examples include the weekly NEOSSat Joint Mission Office (JMO) meeting and the M3MSat weekly operations meeting.
3. Quarterly Meetings with CSA and Contractor's contract management.

Other coordination meetings may be added by the Contractor as required.

### 6.2.5 Periodic Reporting

[REQ-626] The Contractor must provide periodic Operational Reports (OR) in accordance with table in APPENDIX 2.

Reports may be regular operational or Contract status reports, authorized task progress reports, or occasional technical reports, and include the following deliverables:

1. Daily Status Reports: operational system, operational tasking, and operational activity status;
2. Spacecraft Anomaly Notice (SCAN): details of satellite anomalies as they occur to be produced within 24 hours of anomaly detection;
3. Weekly Operation Scheduling Meeting (WOSM) Reports: record of the WOSM (see Section 4.1.1.1), operational activities scheduled and completed;
4. Monthly Progress Reports: contractual status, task progress for work under Task Authorizations, and financial performance;
5. System Operation Quarterly Reports (SOQR): summary of operational activities; highlights of major events; anomaly investigation progress; system status, for each operational mission;
6. Service Performance Report (SPR): assessment of the PIs and KPIs, and evaluation of the derived incentive cost;
7. Operational Analysis Reports (OAR): technical studies including general spacecraft health reports, within the scope of this this SOW, as authorized by CSA. (Typically, 5 per year per mission.)

#### 6.2.6 Contract Management Deliverables

[REQ-627] The Contractor must prepare and deliver the contractual deliverable documents as requested in the APPENDIX 2.

##### *6.2.6.1 Document Deliverables, Format and Content*

[REQ-628] The Contractor must ensure that documents delivered comply with the general preparation instructions and applicable Data Item Description (DID) as found in APPENDIX 3, whenever provided.

##### *6.2.6.2 Operational Documentation Updates*

[REQ-629] The Contractor must propose corrective and improvement updates to operational procedures and technical documentation pertaining to his Work whenever appropriate.

##### *6.2.6.3 Document Approval*

When applicable and as prescribed in APPENDIX 2, the CSA TA will provide approval or disapproval within ten (10) working days of receiving the document. In the event that a document is disapproved, the CSA TA will advise the Contractor in writing, as to the reasons for such disapproval. Such notification will include a full explanation of the reasons for the lack of approval and will direct the additions, deletions and/or corrections, which the CSA TA deems are required for approval. With this notification, the CSA TA will provide the allowable delay for re-submission.

For other documents for review only, the CSA will provide review comments and suggestions within ten (10) working days of receiving the documents.

### 6.3 Accommodation

#### 6.3.1 Work Location

[REQ-630] All work must be conducted on CSA premises (as described in Section 3.2) unless otherwise stipulated by the CSA.

[REQ-631] Subject to security requirements, the Contractor may propose to relocate a portion of operations, in which case:

1. the Contractor must propose for CSA approval a plan to relocate and a plan to restore to the baseline,
2. the work must not be relocated without written approval from CSA, and
3. there must be no cost to CSA associated with any such approved relocation and restoration to the baseline;

[REQ-632] From time to time, the CSA may request that operational personnel travel to undertake duties related to operational system preparation or maintenance at other locations including those identified in Section 1.3. Such travel is cost-reimbursable as per Contract, subject to the Travel Regulations defined by the Treasury Board as specified in the Basis of Payment (BoP), and must be pre-authorized in writing by the TA as the CSA representative.

#### 6.3.2 Work Conditions

CSA will provide reasonable office accommodation (as per Section 3.2.1.3), access, and environmental control. For off-hours work, CSA accommodation includes limited rest facilities as described in Section 3.2.1.

### 6.3.3 Government Furnished Information and Equipment

The Government Furnished Information and Government Furnished Equipment (GFE) are detailed in Section 3.2.5.

### 6.3.4 Work Duty Cycle

[REQ-634] Contractor must ensure a continued presence of qualified operational personnel on CSA premises during the Contractor's regular office hours (as determined by the Contractor).

Those who work regular hours may be expected from time to time to work extra time as authorized and warranted by the demands of the work. For the primary scope of the Mandatory Work as defined in Section 4, overtime charges are under the full responsibility of the Contractor.

The nature of some tasks, particularly software and network maintenance, do require a sub-set of Contractor operational personnel to be on-call outside of regular hours, in order to respond to abnormal system behaviour and maintain the required level of system availability. For the primary scope of the Mandatory Work as defined in Section 4, on-call charges are under the full responsibility of the Contractor.

The nature of some tasks, particularly real-time pass operation and hardware maintenance, requires that a number of specified personnel (typically 2 to 4) be present on site at all times (24 hours, 7 days per week) in order to deliver on the mission objectives. For the primary scope of the Mandatory Work as defined in Section 4, shift-work charges are under the full responsibility of the Contractor.

### 6.3.5 Qualifications

[REQ-635] The Contractor must ensure that personnel possess the appropriate qualifications for the services to be provided.

[REQ-636] The Contractor must ensure that personnel maintain the appropriate security classification for the services to be provided as prescribed in the Security Requirement Check List (SRCL).

[REQ-637] The working language for the work of this SOW is English, and all operational personnel must be fluent in English.

## 7 Contractual Framework Requirements

The Satellite Flight Operations and Data Management Services will be conducted according to the following phases:

- A Phase-In Phase (PIP),
- An Initial Operations Phase (IOP),
- A Nominal Operations Phase (NOP),
- An optional Extended Operations Phase (EOP), and
- An optional Phase-Out Phase (POP).

Detailed requirements for each phase are defined in the following sections. The key milestones for this contract are presented on Figure 3 summarized in Table 7-1.

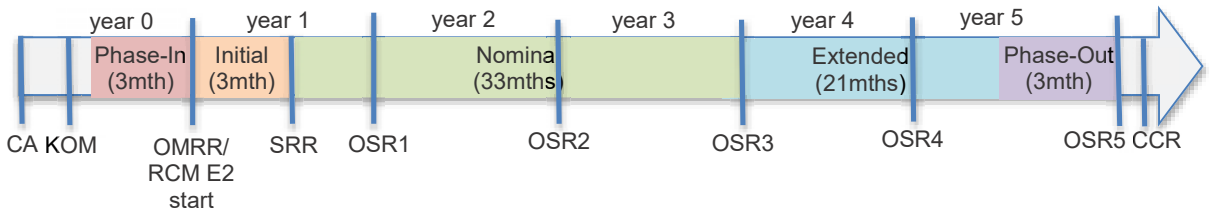



Figure 3 Contract Phases and Milestones

**Table 7-1 Contract Milestones**

| Milestone | Objective | Timeframe | Comments |
|---|---|---|---|
| **Contract Award (CA)** | To review and agree on the SLA | Fall 2020 | Depending on the bid evaluation process and contract negotiations. |
| **Kick-Off Meeting (KOM)** | To review and clarify expectations, and needs | 1 month after Contract Award but no later than Phase-In starts | The Phase-In Phase (PIP) starts sometime after successful completion of the KOM and should provide sufficient training and transition time before OMRR. |
| **Operations and Maintenance Readiness Review (OMRR)** | To demonstrate the Contractor's readiness to operate and maintain | KOM+3 months | OMRR completes the PIP. OMRR should coincide with the end of RCM Phase E1. The Initial Operations Phase (IOP) starts after the successful completion of the OMRR. |
| **Service Readiness Review (SRR)** | To demonstrate the Contractor's ability to perform according to the SLA | OMRR+3 months | SRR completes the Initial Operations Phase (IOP) |
| **Operations Service Review 1 (OSR1)** | To assess the Contractor's performance according to the SLA | OMRR+1 year | OSRs are yearly reviews of the Service delivered by the Contractor. The optional Extended Operations Phase (EOP) starts after the OSR3. The optional Phase-Out Phase (POP) would start 3 months before the last OSR. |
| **OSR2** | | OSR1+1 year | |
| **OSR3** | | OSR2+1 year | |
| **OSR4** (if optional Extended Operations Phase is exercised) | | OSR3+1 year | |
| **OSR5** (if optional Extended Operations Phase is exercised) | | OSR4+1 year | |
| **Contract Complete Review (CCR)** | To confirm the completion of all contractual activities | End of the Contract, sometime after the last OSR | |

### 7.1 Phase-In (PIP)

The Phase-In Phase (PIP) starts after the Kick-Off Meeting (KOM). This PIP for the Contractor will overlap with the Phase-Out Phase (POP) of the incumbent service provider. This phase must not exceed three (3) months. It aims at the preparation of the Contractor for the operations and maintenance services hand-over. During this phase, the incumbent service provider is still responsible for the performance of Satellite Flight Operations and Data Management Services, while supporting at the same time with dedicated resources the hand over activities (training, knowledge transfer, etc). During PIP, the Contractor must establish its own maintenance processes, organization and resources. Also, during the PIP, limited office space may be temporarily provided to the Contractor, with the understanding that the office space would continue to be used by the incumbent Contractor.

This phase concludes with an Operations and Maintenance Readiness Review (OMRR) that confirms the readiness of the Contractor for the hand-over of CSA Satellite Flight Operations and Data Management Services and to start the Initial Operations Phase. The OMRR should coincide with the end of the incumbent service contract.

#### 7.1.1 Incumbent contractor support during Phase-in

The following support will be provided to the Contractor by the CSA and incumbent service provider during PIP:

- Initial training at the CSA St-Hubert premises organized in training sessions covering all the Mandatory Work elements and spread over the PIP for 20 individuals of the Contractor's team;
- Q&A sessions organized by topics in order to complement the trainings;
- Hosting at the CSA St-Hubert premises for up to 20 Contractor team members (same members for the complete duration) to:
    - witness the satellite flight operations and data management daily operations;
    - participate in the typical operations processes, through hands-on for operational procedures execution, monitoring and reporting activities (under the supervision of the incumbent operations team);
    - witness maintenance version and patch acceptance meetings, to get technical knowledge on subsystems and contractual knowledge on the subcontractor follow-up process;
    - witness integration and validation tasks involving maintenance and operations team; and,
    - witness installation, validation and acceptance of new system components version.

Indications on the number of attendees to training sessions are defined for the sake of efficiency and do not suggest any recommended Contractor team size.

#### 7.1.2 Delivery of access control, supporting documentation and anomaly/issue reports

The CSA satellite flight operations and data management operational hardware and software accesses (RCM and small missions), as well as office spaces, will only be transferred to the Contractor at the conclusion of a successful OMRR.

The System software configuration notes, source code and system documentation from the RCM and small missions will be made available by CSA to the Contractor at the Kick-Off, and re-delivered at hand-over in their final version. Refer to APPENDIX 2 for the schedule of deliverables during PIP.

#### 7.1.3 Phase Planning Requirements

[REQ-710] After Contract Award and before PIP, the Contractor must organize the KOM and demonstrate that the Operation Team is ready to be deployed and start planned activities in accordance with the Phase-In Plan.

[REQ-711] The Contractor must deliver at KOM the applicable version of the Operations & Maintenance Plan (OMP) (APPENDIX 2) defining the approach to ensure the full readiness for the operations and maintenance services, including a set of measurable readiness criteria that will be verified and accepted as part of the OMRR.

### 7.1.4 Phase Execution Requirements

[REQ-713] Following the KOM, the Contractor must begin PIP activities, during which the Contractor collaborates with the incumbent service provider to receive training and knowledge transfer, and gain the necessary level of expertise in performing the Services.

[REQ-714] The PIP ends with the successful completion of the OMRR, which must confirm the adequate expertise and knowledge transfer to the Contractor in order to enable the start of the IOP.

### 7.1.5 Review Requirements

[REQ-715] At the end of the PIP, the Contractor must organize the OMRR and provide the evidences of the successful knowledge transfer and readiness to perform:

1. End-to-end Satellite Flight Operations and Data Management Services detailed in this SOW;
2. Level-1 and level-2 System Maintenance for all operated systems and missions subject to this SOW;
3. Maintenance of the detailed procedures for each of the daily task referenced in the SOW, in line with the RCM and small missions technical baseline and with all operations needs;
4. Daily generation and distribution of the pass plan for the next period;
5. Generation and distribution of all operational products;
6. Submission of quarterly Service Performance Reports (SPR);
7. Whenever relevant, report on the Satellite Flight Operations and Data Management Services outcomes in the appropriate report, and when necessary, manage the resulting RCM and multi-mission anomalies and/or Action Items.

At the successful completion of the OMRR, the CSA will authorize the hand-over of the operations and maintenance services (e-g the transfer of system configuration) from the Incumbent to the Contractor. Until authorized, the CSA and incumbent service provider will remain responsible for all operational systems and activities.

The OMRR will be considered successful upon completion of the following:

- Successful completion of all the training and on-site knowledge transfer activities with the Incumbent (evidence to be provided by dedicated report);
- All OMRR document deliverables are formally approved by CSA;
- Confirmation and completion evidence of the team, organisation and facilities setup and readiness, according to the OMP (evidences to be provided by dedicated report);
- Successful completion of the execution of a rehearsal scenario covering the full end-to-end operation activities using existing datasets for simulating the operational systems;
- Detailed checklist evidencing the readiness for the handover, the known issues and the related resolution/mitigation actions;
- Evidence of the hand-over of the open anomalies backlog, and of readiness for anomaly management using the appropriate configuration management tool.

### 7.2 Initial Operations Phase (IOP)

Initial Operations Phase (IOP) is a 3-month phase, following the PIP and the successful completion of the OMRR. During this phase, the Contractor implements the Services according to a partial application of the Service Level Agreement (SLA) [AD-01], called the "*relaxed*" SLA or "grace period", during which the PIs and KPIs are calculated but the cost modulation is not applied. This phase concludes with a Service Readiness Review (SRR) that confirms the readiness of the Contractor to enter into Nominal Operations Phase (NOP).

#### 7.2.1 Phase Planning Requirements

There is no phase planning requirements for this phase.

#### 7.2.2 Phase Execution Requirements

[REQ-720] Following the OMRR and the successful service hand-over, the Contractor must begin the Initial Operation Phase, during which the Contractor performs the Services in line with the overall set of requirements of this SOW.

[REQ-721] During the IOP, the Contractor must deliver to CSA the nominal services performance reporting on the applicable PIs and KPIs, while the SLA incentives will not apply.

[REQ-722] The IOP ends with the successful completion of the Service Readiness Review (SRR), which must confirm the adequate performance level of the Contractor in order to enable the start of the NOP.

#### 7.2.3 Phase Review Requirements

[REQ-723] At the end of the IOP, the Contractor must organize the SRR, in which the Contractor must demonstrate:

1. Its ability to perform nominal operations for the full set of applicable functions and services at the performance level agreed at KOM;
2. Its ability to collect, monitor and control the overall system performance as well as the end-to-end quality of the Operation Services;
3. Its ability to monitor Service performance against the SLA and account related cost modulation; and
4. That it has completed the implementation of the OMP for the IOP, and is ready to routinely manage the Service.

The SRR should provide the same deliverables of an OSR, reduced to the limited time scope of the Initial Operations period. Detailed content of the SRR package must be defined in the OMP, on the basis of the required deliverables in APPENDIX 2.

### 7.3 Nominal Operations Phase (NOP)

During the Nominal Operations Phase (NOP), the Contractor is responsible for the implementation of Satellite Flight Operations and Data Management Services applying the full SLA. NOP (including the IOP) should normally last three (3) years from the OMRR or start of IOP. During this phase, periodic Operations Service Reviews (OSRs) are to be held on a yearly basis starting from the OMRR.

#### 7.3.1 Phase Planning Requirements

There is no phase planning requirements for this phase.

#### 7.3.2 Phase Execution Requirements

[REQ-731] During NOP, the Contractor must perform the complete set of activities requested in this SOW, fully delivering the required services at the agreed performance level provided in the SLA.

[REQ-732] During NOP, the contractor must deliver to the CSA the nominal services performance reporting on the applicable PIs and KPIs while the SLA agreed at contract signature is fully applicable starting from the beginning of this phase.

#### 7.3.3 Phase Review Requirements.

[REQ-733] During NOP, the Contractor must organize an Operational Service Review (OSR) at the end of each 12-month cycles, starting from the OMRR and provide the following information:

1. SPR providing evidence of the evolution of the system performance since the start of the contract, with focus on the period since previous OSR;
2. Annual long-term trends of the information reported in the weekly/monthly reports;
3. Report on incident/anomalies trends, corrective actions and impacts;
4. Report on operational maintenance status;
5. Updated risk register;
6. List of major issues experienced since previous OSR, status and lessons learnt;
7. Major activities planned for the following period; and,
8. Status of services evolutions proposals and implementation.

As required, SLA changes and updates will also be done as part of the OSRs, as per SLA review process [AD-01 Section 5].

### 7.4 Extended Operations Phase (EOP)

Extended Operations Phase (EOP) is an optional extension to the NOP, where the Contractor has to provide the same Services at the same agreed level. If the need arises and is warranted by the TA, the EOP will be granted by the Contracting Authority during the course of the Contract execution.

#### 7.4.1 Phase Planning Requirements

There is no phase planning requirements for this phase.

#### 7.4.2 Phase Execution Requirements

[REQ- 742] During EOP, the Contractor must perform the same set of activities as during the NOP, at the same agreed level of performance, and subject to the fully applicable SLA.

#### 7.4.3 Phase Review Requirements

[REQ-743] During EOP, the Contractor must organize an OSR at the end of each 12-month cycles, starting from the OMRR, with same content as during a NOP OSR.

### 7.5 Phase-Out Phase (POP)

The optional Phase-Out Phase (POP) for the Contractor will overlap with the PIP of the potential successor service provider, if different. This phase is explicitly initiated by Task Authorization and must not exceed three (3) months. It aims at the preparation of the next service provider for the operations and maintenance services training and hand-over. During this phase, the Contractor is still fully responsible for the performance of Satellite Flight Operations and Data Management Services, while supporting at the same time with dedicated resources the hand over activities (training, knowledge transfer, etc.).

### 7.5.1 Phase Planning Requirements

There is no phase planning requirements for this phase.

### 7.5.2 Phase Execution Requirements

[REQ-750] During POP, the Contractor must perform the same set of activities as during the NOP, at the same agreed level of performance, and subject to the fully applicable SLA.

[REQ-751] During POP, while continuing Services at the same performance level, the contractor must implement a smooth and full transfer of knowledge and expertise to a possible successor service provider of the Services carried out by the Contractor under the Contract, including the following activities:

1. Initial training at the CSA St-Hubert premises organized in training sessions covering all the Mandatory Work and spread over the POP for 20 individuals of the successor service provider;
2. Q&A sessions organized by topics in order to complement the trainings;
3. Hosting at the CSA St-Hubert premises for up to 20 successor service provider team members (same members for the complete duration) to:
    a. witness the satellite flight operations and data management daily operations;
    b. participate in the typical operations processes, through hands-on for operational procedures execution, monitoring and reporting activities (under the supervision of the incumbent operations team);
    c. witness maintenance version and patch acceptance meetings, to get technical knowledge on subsystems and contractual knowledge on the subcontractor follow-up process;
    d. witness integration and validation tasks involving maintenance and operations team; and,
    e. witness installation, validation and acceptance of new system components version.

[REQ-752] The contractor must develop and provide the Phase-Out Plan three (3) months before the start of POP, along with all the necessary training material.

### 7.5.3 Phase Review Requirements

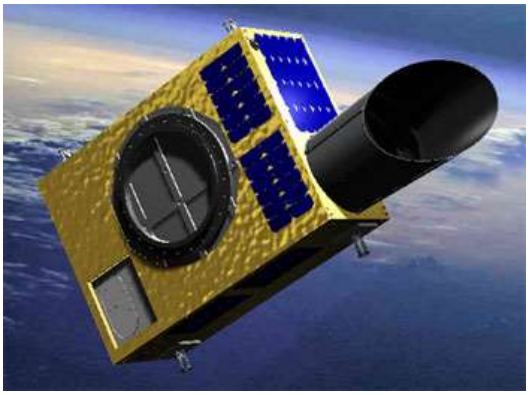
[REQ-753] The Contractor must organise a Contract Closure Review (CCR) with the objective to confirm the completion of all contractual activities including the optional EOP and POP, in which the Contractor must present:

1. All operational documentation, procedures, databases, status of anomalies, etc. needed to perform the satellite flight operations, data management and operational maintenance activities, for all the CSA satellite flight operations and data management elements under the Contractor’s responsibility,
2. Current CSA satellite flight operations and data management configuration baseline, from sub-system to centre and system level,
3. SPR providing evidence of the measured system performance and KPIs during the course of the contract and in particular the last 3 months of operations, and
4. Lessons learned.

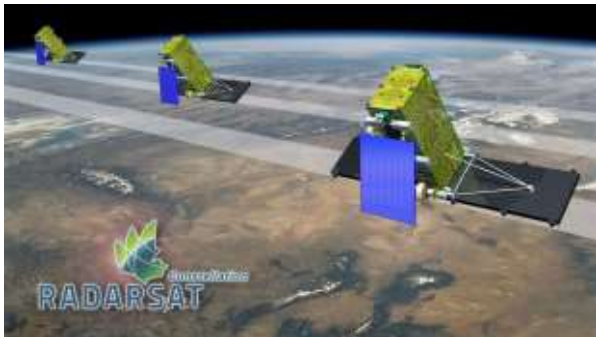
**APPENDIX 1 Mission Fact Sheets**

| SCISAT | | | |
|---|---|---|---|
| Mission Type: | Earth Science |  | |
| Operator: | Canadian Space Agency | | |
| End Users: | University of Waterloo | | |
| SATCAT: | 27858 | | |
| Launch date: | 12 August 2003 | | |
| Design Life: | 2 years | | |
| Mission Objective: | Measure and understand the chemical processes that control the distribution of ozone in the Earth's atmosphere, particularly in the northern latitudes. | | |
| Orbit Description | | | |
| Type: | LEO Polar | Orbit Period: | 97.7min |
| Altitude: | 650km | Orbit Control: | N/A |
| Inclination: | 73.9deg | LTAN : | Variable |
| Spacecraft Description | | | |
| Bus: | Microsatellite | Payload: | Fourier-Transform Spectrometer, MAESTRO |
| Manufacturer: | Bristol Aerospace | Manufacturer: | ABB Bomem |
| Mass: | 150kg | Bands: | VIS (525nm), IR (1.02um) |
| Operations | | | |
| MOC: | SHUB | SOC: | University of Waterloo |
| TT&C stations: | SHUB, SASK, PASS, GSS, ICAN, KRN, SAN | Reception stations: | Same as TT&C |
| Frequency: | S-band (RX/TX) | Frequency: | Same as TT&C |
| # Contact/day | 4-7 | # Contact/day | 12 |

| RADARSAT-2 | | | |
|---|---|---|---|
| Mission Type: | Earth Observation |  | |
| Operator: | MDA | | |
| End Users: | DND, EC, AAAC, DFO, Industry. | | |
| SATCAT: | 32382 | | |
| Launch date: | 14 December 2007 | | |
| Design Life: | 7.25 years | | |
| Mission Objective: | Sea ice mapping and ship routing, iceberg detection, agricultural crop monitoring, marine surveillance for ship and pollution detection, terrestrial defence surveillance and target identification, geological mapping, mine monitoring, land use mapping, wetlands mapping. | | |
| **Orbit Description** | | | |
| Type: | Sun-Synchronous | Orbit Period: | 100,7min |
| Altitude: | 798km | Orbit Control: | 6 Hydrazine thrusters |
| Inclination: | 98.6deg | Requirement: | LTAN +- 15 min |
| LTAN: | 18:00 + 15min | Repeat Cycle: | 24 days (343 orbits) |
| **Spacecraft Description** | | | |
| Bus: | Prima | Payload: | Synthetic Aperture Radar |
| Manufacturer: | Alenia Spazio | Manufacturer: | MacDonald Dettwiler |
| Launch Mass: | 2,300kg | Bands: | C-band (5.405 Ghz) |
| **Operations** | | | |
| MOC: | SHUB | Data Center: | CCMEO Ottawa |
| TT&C stations: | SHUB, SASK, PASS, GSS, ICAN, KRN | Reception stations: | PASS, GSS, ICAN |
| Frequency: | S-band (RX/TX) | Frequency: | X-Band |
| # Contact/day | 6-8 | # Contact/day | 6-10 |

| NEOSSAT | | | |
|---|---|---|---|
| Mission Type: | Space Surveillance and Space Astronomy |  | |
| Operator: | Canadian Space Agency | | |
| End Users: | DRDC, NRC and astronomers across Canada | | |
| SATCAT: | 39089 | | |
| Launch date: | 25 February 2013 | | |
| Design Life: | 2 years | | |
| Mission Objective: | For DRDC: *High Earth Orbit Space Surveillance* (HEOSS) use NEOSSat to conduct experimental satellite tracking activities. For CSA: Space Astronomy missions as defined by the Canadian astronomers participating in the NEOSSat Guest Observer program. These typically include imaging of asteroids, comets and variable stars, such as those hosting exoplanets. | | |
| Orbit Description | | | |
| Type: | LEO Polar | Orbit Period: | 100.41min |
| Altitude: | 776-792km | Orbit Control: | N/A |
| Inclination: | 98.61deg | LTAN | Variable |
| Spacecraft Description | | | |
| Bus: | Microsatellite | Payload: | 15-cm Rumak-Maksutov telescope |
| Manufacturer: | Microsat Systems | Manufacturer: | Microsat Systems |
| Mass: | 74kg | Bands: | VIS |
| Operations | | | |
| MOC: | SHUB | SOC: | DRDC Ottawa and SHUB |
| TT&C stations: | SHUB, SASK, PASS, GSS, ICAN | Reception stations: | Same as TT&C |
| Frequency: | S-band (RX/TX) | Frequency: | Same as TT&C |
| # Contact/day | 4 | # Contact/day | Same as TT&C |

| M3MSAT | | | |
|---|---|---|---|
| Mission Type: | Telecommunication |  | |
| Operator: | Canadian Space Agency | | |
| End Users: | DND, TC, ExactEarth | | |
| SATCAT: | 41605 | | |
| Launch date: | 22 June 2016 | | |
| Design Life: | 2 years | | |
| Mission Objective: | Improve Canada's space-based capabilities to detect ships and manage marine traffic. | | |
| **Orbit Description** | | | |
| Type: | Sun-synchronous | Orbit Period: | Approx. 95min |
| Altitude: | 515km | Orbit Control: | N/A |
| Inclination: | 97.5deg | Requirement: | N/A |
| LTAN: | Variable | Repeat Orbit: | N/A |
| **Spacecraft Description** | | | |
| Bus: | Microsatellite | Payload: | Automatic Identification System |
| Manufacturer: | Honeywell | Manufacturer: | Honeywell |
| Mass: | 85kg | Bands: | AIS |
| **Operations** | | | |
| MOC: | SHUB | SOC: | ExactEarth, Cambridge |
| TT&C stations: | SHUB, SASK, PASS, GSS, ICAN. | Reception stations: | Cambridge |
| Frequency: | S-band (RX/TX) | Frequency: | C-Band |
| # Contact/day | 3 | # Contact/day | N/A |

| RADARSAT CONSTELLATION MISSION | | | |
|---|---|---|---|
| Mission Type: | Earth Observation |   | |
| Operator: | Canadian Space Agency | | |
| End Users: | DND, EC, AAAC, DFO | | |
| SATCAT: | 44322, 44324, 44323 | | |
| Launch date: | 12 June 2019 | | |
| Design Life: | 7 years | | |
| Mission Objective: | Maritime surveillance (ice, surface wind, oil pollution and ship monitoring)<br>Disaster management (mitigation, warning, response and recovery)<br>Ecosystem monitoring (agriculture, wetlands, forestry and coastal change monitoring) | | |
| Orbit Description | | | |
| Type: | LEO Polar | Orbit Period: | 96.4min |
| Altitude: | 586-615km | Orbit Control: | 6 hydrazine thrusters |
| Inclination: | 97.74deg | Requirement: | 100m orbital tube |
| LTAN: | 18:00 +/- 15min | Repeat Cycle: | (12 days) 179 Orbit |
| Spacecraft Description | | | |
| Bus: | Canadian SmallSat Bus | Payload: | Synthetic Aperture Radar |
| Manufacturer: | Bristol Aerospace | Manufacturer: | MacDonald Dettwiler |
| Mass: | 1400kg each | Bands: | C-band (5.405 Ghz) |
| Operations | | | |
| MOC: | SHUB | Data Center: | CCMEO Ottawa |
| TT&C stations: | SHUB, SASK, PASS, GSS, ICAN, KRN | Reception stations: | PASS, GSS, ICAN, CAAL, CAMA, |
| Frequency: | S-band (RX/TX) | Frequency: | X-band |
| # Contact/day | 4 per spacecraft | # Contact/day | 12-15 per spacecraft |

## APPENDIX 2 Deliverables and Contract Data Requirements List (CDRL)

### A2.1 Data Deliverables

Data Deliverables must be delivered as per Table 7-2. Draft versions are for Review only.

**LEGEND**

- **MILESTONES**
  - **KOM** = Kick-Off-Meeting
  - **OMRR** = Operations and Maintenance Readiness Review
  - **SRR** = Service Readiness Review
  - **OSR** = Operation Service Review (at the end of each contractual years)
  - **CCR** = Contract Complete Review
- **CDRL CATEGORY**
  - **CM** = Contract Management
  - **OR** = Operational Reports
- **RELEASE CATEGORY**
  - **Da** = Daily
  - **D** = Draft
  - **F** = Final
  - **IR** = Initial Release
  - **M** = Monthly
  - **O** = Optional
  - **Q** = Quarterly
  - **U** = Updated
  - **X** = As Required / As available
  - **W** = Weekly
- **APPROVAL CATEGORY**
  - **A** = For approval
  - **R** = For review
- **OTHER**
  - **CF** = Contractor Format

**Table 7-2 Contract Data Requirement List (CDRL)**

| CDRL No. | Category | Deliverable | DID No. | Proposal | KOM | OMRR | SRR | OSR | CCR | Approval Category | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CDRL-01** | CM | Service Management and Implementation Plan (SMIP) | 001 | IR | U | U | U | U | | A | To be updated as necessary to reflect any service management and implementation changes (e.g. as a result of options activation) |
| **CDRL-02** | CM | Master Schedule | CF | IR | U | U | U | U | | A | To be updated as necessary to reflect any project management changes (e.g. as a result of options activation) |
| **CDRL-03** | CM | Risk Management Plan | 002 | IR | U | U | U | | | R | |
| **CDRL-04** | CM | Risk Register | 003 | IR | U | U | U | U | | R | |
| **CDRL-05** | CM | Suggestions for Service Level Agreements (SLA) | [AD-01] | O | | U | | U | | R | PI suggestions and recommendations |
| **CDRL-06** | CM | Innovation and Automation Plan (value-added proposal) | CF | O | | X | X | X | X | A | According to value added proposition technical merit criteria |
| **CDRL-07** | CM | Operations and Maintenance Plan (OMP) | 004 | D | U | IR | U | U | | A | To be updated:<br>- yearly<br>- when new scenarios/ options are operated<br>- when workplan is updated |
| **CDRL-08** | CM | Phase-Out Plan | 005 | | | | | IR | F | A | To be delivered 3 months before POP |
| **CDRL-09** | CM | Training Material | CF | | | | | IR | F | A | To be delivered 3 months before POP |
| **CDRL-10** | CM | Lessons Learned | CF | | | | | D | F | R | |
| **CDRL-11** | CM | Meeting Agendas and Minutes | 006 | | X | X | X | X | X | A | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **OR-01** | OR | Daily Status Reports | CF | | | Da | Da | Da | Da | R | See Section 6.2.5 |
| **OR-02** | OR | Spacecraft Anomaly Notice (SCAN) | CF | | | W | W | W | W | R | See Section 6.2.5 |
| **OR-03** | OR | Weekly Operation Scheduling Meeting (WOSM) Reports | CF | | | W | W | W | W | R | See Section 6.2.5 |
| **OR-04** | OR | Monthly Progress Reports | CF | | | M | M | M | M | R | See Section 6.2.5 |
| **OR-05** | OR | System Operation Quarterly Reports (SOQR) | CF | | | Q | Q | Q | Q | R | See Section 6.2.5 |
| **OR-06** | OR | Service Performance Report | CF | | | | Q | Q | | A | For PIs and KPIs, See Section 6.2.5 |
| **OR-07** | OR | Operational Analysis Reports (OAR) | CF | | | X | X | X | X | R | See Section 6.2.5 |

**APPENDIX 3 Data Item Description (DID)**

**DID-000 – General Preparation Instructions**

**PURPOSE:**

This DID specifies:

a) format requirements for project documents and data delivered by the supplier in compliance with the Contract Data Requirements List (CDRL)

b) document and data delivery methods and communication of submission and receipt

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**INSTRUCTIONS:**

**1. GENERAL REQUIREMENTS:**

1.1. All documents and data must be written in the English language. The term “documents” includes change requests, change notices and requests for deviations and waivers.

1.2. All documents must include the following elements on the cover page:

a) Document Number and date: Volume x of y (if multivolume)

b) Rev. indicator / date of Rev.

c) Document Title

d) Contract Name

e) Contract No.

f) CDRL Item No. or Nos., if one document responds to more than one CDRL, subject to prior approval from the PA.

g) Prepared for: Canadian Space Agency

h) Prepared by: Contractor name, CAGE Code, address, and phone number

i) Product tree identifier, if applicable

j) © HER MAJESTY THE QUEEN IN RIGHT OF CANADA [YEAR].

1.3. All documents must include on the header of each page its Security Designation of the contents, or subject to ITAR, when applicable.

1.4. All documents must include page numbering in the footer.

1.5. Documents and data must be released by the supplier and submitted in native electronic format (Microsoft Word, Excel, MS Project, etc.) and in PDF format. Schedules must be submitted in Microsoft Project format (or equivalent) and PDF format.

**2. FILE NAMING INSTRUCTIONS:**

Document file names must contain as a minimum:

- Document number
- Document Title including the acronym of the Mission or SatOps as applicable
- Revision number
- Security Designation of the contents. Indicate if contents are subject to ITAR, when applicable

**3. FILE DISTRIBUTION INSTRUCTIONS:**

Documents must be released in its designated Configuration Management system (CADMS when not specified otherwise)

**DID-001 – Service Management and Implementation Plan**

**PURPOSE:**

The Service Management and Implementation Plan (SMIP) is used to guide both Services execution and control.

The SMIP is used by the Government to assess the adequacy of the Contractor's plan for management of the work and to provide a basis on which to monitor and assess the progress of the work.

**PREPARATION INSTRUCTIONS:**

The SMIP must contain information allowing to:

- Guide the Services execution;
- Demonstrate an understanding of the technical scope of work, goals and constraints;
- Document planning assumptions;
- Document planning decisions regarding alternatives chosen;
- Document the operational organization and staffing plan;
- Facilitate communications amongst stakeholders;
- Define key management reviews as to content, extent and timing; and
- Provide a baseline for progress measurement and Services control.

When the Contract has specified delivery of another document that contains aspects of the required information, the SMIP should summarize these aspects and refer to the other document.

**DID-002 – Risk Management Plan**

**PURPOSE:**

The Risk Management plan (RMP) describes the structured and methodical approach to risk management for the project for the Contractor and for each of the subcontractors.

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**PREPARATION INSTRUCTIONS:**

The Risk Management Plan (RMP) must contain the following information, as a minimum:

1) Description of RMP purpose;
2) Project Overview: provide a brief overview of the project and its deliverables while focussing on perceived risk areas;
3) Risk categories or Risk Breakdown Structure to facilitate risk identification to a consistent level of detail. The following main categories must be used for the first level of the risk breakdown structure:
   a) Cost – Risks associated with system acquisition or development cost exceeding the budget,
   b) Schedule – Risks associated with achieving designated milestones within the designated time frame,
   c) Technical – Risks associated with the engineering process that may keep the system from meeting its technical specifications or may adversely affect overall system quality and performance, and
   d) Programmatic – Risks associated with programmatic factors such as export control, regulations, changes to the project environment, force majeure, etc.;
4) Risk Identification methodology describing the approach to be followed for identifying and documenting risks that might affect the project. The risk statement must identify the risk cause as well as its consequence using the following wording: *"there is a risk that* _____ (specify cause*) resulting in* _____ (specify consequence)*".* Risks must be grouped by category and identified to one or more specific work packages. Lessons learned from previous projects should be considered;
5) Risk Analysis methodology describing the approach for assessing the likelihood and consequence of each risk to be identified; this should take the form of the usual likelihood vs. consequence matrix;
6) Risk Response Plan section describing the strategies that will be considered in responding to each risk, the decision making approach in choosing the right strategy, and the documentation of the resulting actions for each risk; this should include contingency plans, appropriate responses for taking advantage of positive risks (opportunities) and risk closure criteria;
7) Risk Monitoring and Control approach describing the procedures and forums (e.g. risk review meetings, committees, boards) to be implemented for monitoring risk status, for following up on response plan actions, for updating the risk assessment and for evaluating the risk management process. A history of changes made to the baseline risk register must be maintained (could simply involve keeping track of former risk reports);
8) Reporting formats describing the format of the risk register as well as any other risk reports or tools required. Must also define how the outcome of the risk management processes will be documented, analyzed and communicated internally and externally;
9) Roles and Responsibilities defining the lead, support, and risk management team membership for each type of activity in the risk management plan including the names of the resources assigned to these roles;

10) Budgeting approach describing the process for assigning resources and estimating costs needed to perform risk management activities; management of risk contingency reserve must also be addressed including the process for releasing funds to implement a mitigation action or to realize a risk; and

11) Timing approach defining when and how often the risk management process will be performed throughout the project. Must also identify the risk management activities to be included in the project schedule.

**DID-003 – Risk Register**

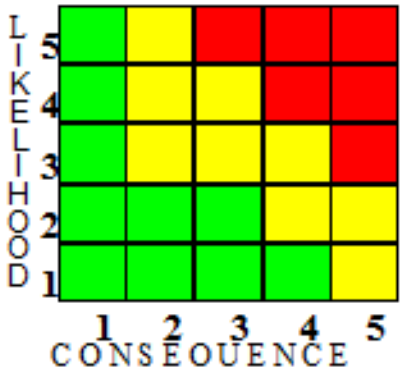
**PURPOSE:**

The Risk Register describes risk items, provides their qualitative and quantitative assessments, and provides a risk response strategy for each.

**PREPARATION INSTRUCTIONS:**

The Risk Register must contain the following information in a tabular format, as a minimum:

1) Header with title, dates, and references as required
2) For each risk items:
   a) Unique ID;
   b) Title;
   c) Category (Scope, Cost, Schedule, Programmatic, Quality);
   d) Description;
   e) Potential Impact Description;
   f) Qualitative Assessment:
      i) Consequence Rating (impact);
      ii) Likelihood Rating (probability);
      iii) Risk Level (Low (green), Moderate (yellow), High (red)) according to the following matrix;




   g) Quantitative Assessment (as required);
   h) Risk Response strategy:
      i) Response category (Accept, Mitigate, Avoid, Transfer);
      ii) Response description;
   i) Residual impact after applying the Risk Response.

**DID-004 – Operations and Maintenance Plan**

**PURPOSE:**

To describe in detail how the operations and maintenance are going to be executed and what are the planning steps.

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**PREPARATION INSTRUCTIONS:**

This document must include the suggested table of contents. Where one of the items listed below is the subject of a separate document, the Plan must merely include a pointer to that document.

**TABLE OF CONTENTS**

1. Introduction
2. Reference documents
3. Mission overview
4. Operation strategies
   - 4.1 Team organization
   - 4.2 Mission assurance approach
5. Maintenance Strategies
6. GFE Integration strategy
7. Implementation process
   - 7.1 Mission, payload and bus lifecycles
   - 7.2 Ground segment and operations lifecycles
8. Mission phases and milestones
9. Implementation schedule
10. Deliverable items
11. Risk assessment (programmatic and technical) including the work done as part of WBS 1.4.1 on the technical risks
12. Issues list that captures all the issues raised during the development of the phase A.

**DID-005 – Phase-Out Plan**

**PURPOSE:**

To describe the optional transition and training activity plan in order to ensure smooth handover the responsibility from one incumbent service provider to the next one at the end of the operational phase.

**PREPARATION INSTRUCTIONS:**

Per Contractor format.

**DID-006 – Meeting Deliverables**

**PURPOSE:**

To identify the deliverables required for a meeting.

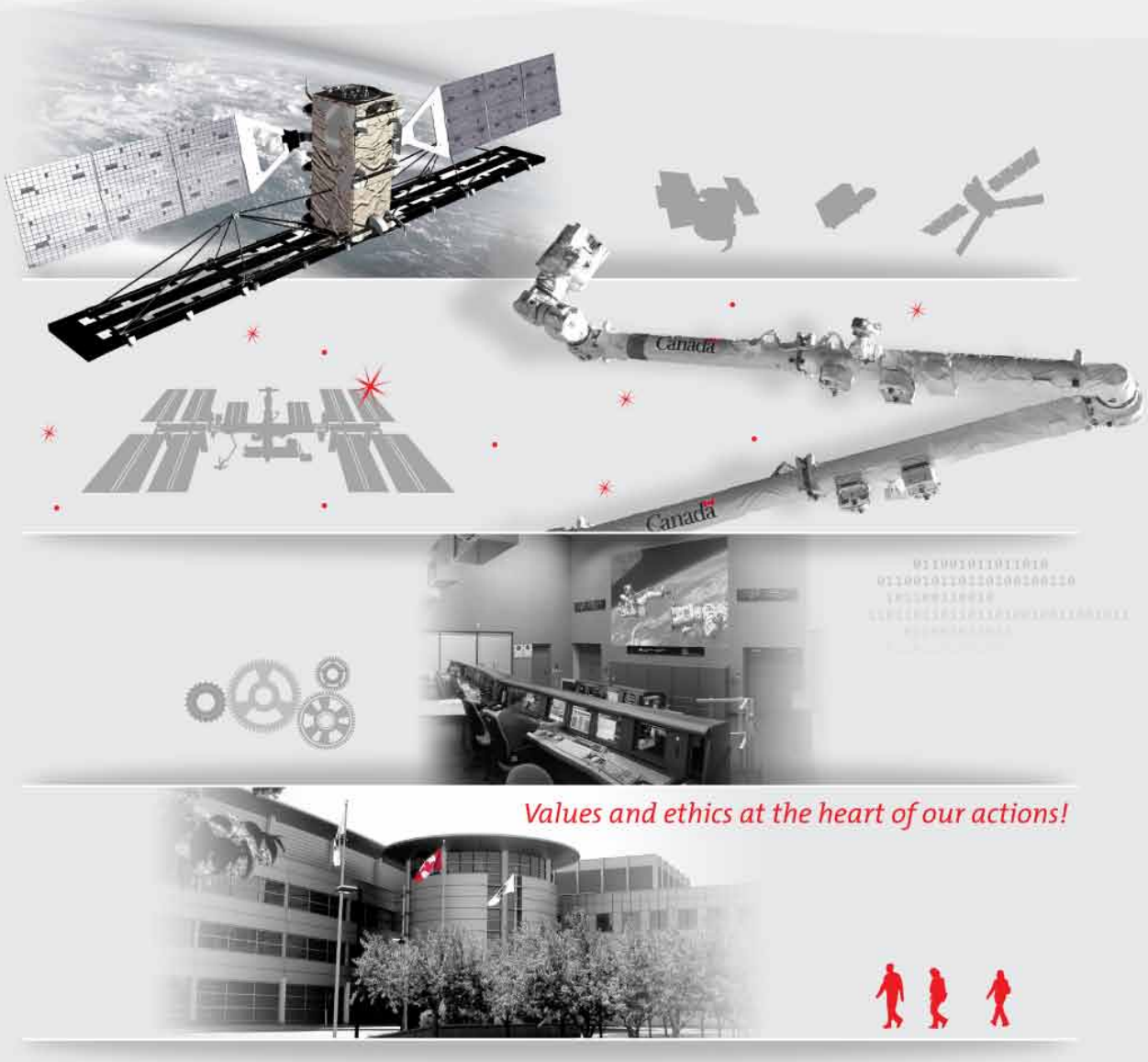
**PREPARATION INSTRUCTIONS:**

The meeting must contain the following deliverables, per contractor format if not otherwise specified by the CSA to be integrated as part of one of the mission's issue tracking systems (SAFzilla, Bugzilla, JIRA):

a) Presentation, including agenda, delivered 1 business day before meeting;

b) Minutes, including meeting purpose, attendees, meeting location, decisions made with the rational, Action Items (AI), delivered within 3 business days after meeting.

# Canadian Space Agency Organizational **Values** and **Ethics** Code




Canadian Space Agency | Agence spatiale canadienne

Canada

# A message from the President

*The Canadian Space Agency (CSA) is an organization that plays a singular role within the federal government owing to the unique nature of its activities. In addition, the CSA is at the forefront of the space field and carries out its mandate within a complex legal and regulatory context where it is necessary to be aware of and to comply with numerous regulations and exercise* ***vigilance and judgment****.*

*The Organizational Values and Ethics Code set out in the following pages is a combination of public*[1] *sector values and values specific to the culture of the CSA organization.*

*The President and the members of the CSA Executive Committee are committed to adopting and promoting the behaviours described in this Code and to ensuring that the Code is implemented in order to provide employees with a healthy and respectful work environment. Implementation of the Code in our day to day activities will ensure the organization's credibility in the eyes of Canadians and our partners.*

Acknowledgements: Thank you to the Values and Ethics Committee, the Diversified Advisory Group, the employee's group and the union members and individuals in all CSA sectors who actively participated in the consultations leading to the creation of the Organizational Values and Ethics Code.

[1] Reference : http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=25049

## Table of Contents

# 1. CONTEXT AND RESPONSIBILITIES

## 1.1 A unique world

Working at the Canadian Space Agency (CSA) makes it possible to discover a fascinating world of space science and technology. In partnership with universities, the industry, research centres and other government agencies across Canada and around the world, the CSA is helping to secure Canada's distinguished place in these priority technological development sectors. Being employed by the Canadian Space Agency also provides the opportunity to work with men and women who are passionate about what they do and are proud of their organization.

Established in March 1989, the CSA derives its authority from the Canadian Space Agency Act, which was assented in December 1990. CSA employees fully contribute to the Agency's mission and adapt to major issues faced by the government, the industry and the world.

It is in this unique and specific federal work environment that CSA employees carry out their duties and perform the expected activities associated with their role in the organization.

## 1.2 Roles and responsibilities of public servants and employees[1]

### The role of federal public servants

Federal public servants have a fundamental role to play in serving Canadians, their communities and the public interest under the direction of the elected government and in accordance with the law. As professionals whose work is essential to Canada's well-being and to the enduring strength of the Canadian democracy, public servants uphold the public trust.

1 Most CSA employees are public servants hired under the Public Service Employment Act. However, the CSA can hire astronauts who are CSA employees but not public servants. Astronauts are subject to the CSA Organizational Code.

The Constitution of Canada and the principles of responsible government provide the foundation for the role, responsibilities and values of the federal public sector. Constitutional conventions of ministerial responsibility prescribe the appropriate relationships among ministers, parliamentarians, public servants and the public. A professional and non-partisan federal public sector is integral to our democracy.

Pursuant to the Public Servants Disclosure Protection Act (PSDPA), the CSA requires an organizational code that **complements, supports and integrates** the Values and Ethics Code for the Public Sector (VECPS). We employees and public servants are required to familiarize ourselves and comply with the provisions of the VECPS, the CSA Organizational Code and the Policy on Conflict of Interest and Post-Employment[2].

## Managers – Additional expectations

Our greatest organizational challenge in meeting our values and ethics objectives is taking full ownership of the core values of the public sector and the CSA by transforming our results-driven organizational culture into a results-driven organizational culture that takes into account people and their influence on these results.

Being results-focussed while taking people into account is consistent with the public sector's management excellence objective, as defined in the Management Accountability Framework (MAF), and with the characteristics of high-performance organizations.

The behaviours adopted by CSA managers and the example they set by adopting and promoting the values of the organization and the public service are of vital importance. Values and ethics are the foundation of leadership in the public service and an integral part of the key leadership competencies. To strengthen an ethical culture, managers demonstrate leadership within their team by

- promoting dialogue and information sharing;

2 See Section 1.3, Implementation of the Code and consequences of noncompliance, below.

- encouraging discussion and inquiry; and
- facilitating the search for solutions and informal dispute resolution.

### The President

As the deputy head of a public sector organization, the President has specific responsibilities under the PSDPA, including establishing an organization code.

The President is responsible for fostering a positive values and ethics culture. He ensures that CSA employees are aware of their obligations under the VECPS and the CSA Organizational Code. He also ensures that employees can obtain appropriate advice within their organization on ethical issues, including possible conflicts of interest.

The President ensures that the current Code, which incorporates the VECPS, and the internal disclosure process are effectively implemented in our organization and regularly assessed and followed up on.

The President also ensures the non-partisan provision of programs and services by the CSA.

The President is subject to the current Code and the Conflict of Interest Act.

## 1.3 Implementation of the Code and consequences of non-compliance

Because we must adhere to the VECPS and the current Organizational Code in our actions and behaviours, compliance with the VECPS, the Organizational Code and the Policy on Conflict of Interest and Post-Employment[3] is a **condition of employment** for all CSA employees and public servants, regardless of their level or position. At the CSA, we can all expect to be treated in accordance with these values. A breach of these values or expected behaviours may result in disciplinary measures, up to and including termination of employment.

3 Also see Appendix I

# 2. THE CSA ORGANIZATIONAL VALUES AND ETHICS CODE

The CSA Organizational Values and Ethics Code outlines in a single document both the values of the Values and Ethics Code for the Public Sector (VECPS) and those specific to the CSA.

The VECPS, which came into effect on April 2, 2012, outlines the expected behaviours that correspond to the values of the federal public sector:

- **Respect for democracy**
- **Respect for people**
- **Integrity**
- **Stewardship**
- **Excellence**

In order to better reflect the CSA's specific environment and culture, we have added the following values to our Organizational Code:

- **Collaboration**
- **Inclusiveness**
- **Innovativeness**
- **Well-being**
- **Accountability**

These values are intrinsic to the other more general values of the Values and Ethics Code for the Public Sector: **collaboration** is related to the principles of respect for people and excellence; **inclusiveness** and **well-being** are part of respect for people; **accountability** covers respect for democracy and integrity; and **innovativeness** pertains to excellence.

However, these values have a significant impact on the way we act in order to meet the CSA's objectives.

# PUBLIC SECTOR CODE VALUES ARE ALSO OUR VALUES

## 2.1 Respect for democracy

The system of Canadian parliamentary democracy and its institutions are fundamental to serving the public interest. Public servants recognize that elected officials are accountable to Parliament and, ultimately, to the Canadian people and that a non-partisan public sector is essential to our democratic system.

Public servants shall uphold the Canadian parliamentary democracy and its institutions by

- respecting the rule of law and carrying out their duties according to the applicable legislation, policies and directives, in a non-partisan and impartial manner;
- loyally carrying out the lawful decisions of our leaders and supporting ministers in their accountability to Parliament and Canadians; and
- providing decision makers with all the information, analysis and advice they need, always striving to be open, candid and impartial.

At the CSA, we ensure that the decisions of our leaders are implemented loyally. CSA employees are professional, objective and impartial, which is vital to our democratic system. In the CSA culture, democracy requires acceptance of diversity, a key CSA value.

### At the CSA, respecting democracy includes

- complying with legislation, policies and directives and acting accordingly.

### Failing to respect democracy includes

- failing to help our leaders make decisions by providing incomplete and biased advice; and
- criticizing our employer's decisions in our public communications (e.g. social media), regardless of our political beliefs.

## 2.2 Respect for people

Treating all people with respect, dignity and fairness is fundamental to our relationship with the Canadian public and contributes to a safe and healthy work environment that promotes engagement, openness and transparency. The diversity of our people and the ideas they generate are the sources of our innovativeness.

Public servants shall respect human dignity and the value of every person by

- treating every person with respect and fairness;
- valuing diversity and the benefit of combining the unique qualities and strengths inherent in a diverse workforce;
- helping to create and maintain a safe and healthy workplace that is free from harassment and discrimination; and
- working with others in a spirit of openness, honesty and transparency that encourages engagement, collaboration and respectful communication.

Respect for people is a public-sector value that is reflected at the CSA in many ways. Treating people with respect, dignity and fairness is fundamental to our employees' relationships with colleagues, managers, partners, Canadians and other individuals. The CSA expects us to show civility, courtesy and decorum. The CSA does not tolerate discrimination, as defined in the Canadian Charter of Rights and Freedoms, harassment or violence between employees (regardless of their group and level) or toward third parties. In that regard, our organization has a Policy on Harassment Prevention in addition to formal and informal complaint resolution procedures.

**At the CSA, showing respect for people includes**

- recognizing the value of every person;
- demonstrating courtesy, diligence, attentiveness and professionalism;
- using respectful language when communicating orally and in writing; and

- fulfilling our responsibilities and obligations with respect to health and safety.

**Failing to show respect for people includes**

- abusing power and using our authority or status to intimidate someone;
- causing harm to individuals or groups by denigrating or undermining them through our words or actions; and
- displaying or circulating suggestive material that could be interpreted as offensive to others.

## 2.3 Integrity

Integrity is the cornerstone of good governance and democracy. By upholding the highest ethical standards, public servants maintain and strengthen public trust in the honesty, fairness and impartiality of the federal public sector.

Public servants shall serve the public interest by

- always demonstrating integrity and acting in a manner that will bear the closest public scrutiny, an obligation that may not be fully satisfied by simply acting within the law;
- never using our official roles to gain advantage for ourselves or others or to place others at a disadvantage;
- taking all possible steps to prevent and/or resolve any real, apparent or potential conflicts of interest between our official responsibilities and our private affairs in favour of the public interest; and
- acting in such a way as to maintain our employer's trust.

**At the CSA, demonstrating integrity includes**

- avoiding real, apparent or potential conflicts of interest;
- managing files and projects with attentiveness while ensuring their integrity;

- treating confidential information with care, so as to protect it;
- being trustworthy; and
- building and maintaining relationships based on integrity with colleagues (internal) and various partners (external).

**Failing to demonstrate integrity includes**

- knowingly participating in unauthorized[4] or illegal activities;
- using CSA property or resources for personal ends;
- claiming inappropriate, wasteful or falsified expenditures; and
- using confidential or privileged information to gain advantage for ourselves or others.

## 2.4 Stewardship

Federal public servants are entrusted with the responsible use and care of public resources, for both the short term and long term.

Public servants shall use resources responsibly by

- effectively and efficiently using the public money, property and resources they manage;
- considering the short and long-term effects of their actions on people and the environment; and
- acquiring, preserving and sharing knowledge and information, as appropriate.

**At the CSA, providing stewardship includes**

- complying with the policies and directives on the use of public money, particularly for purchases, rentals, hospitality, travel, conferences and training;

4 For example, taking part in unauthorized political activities or speaking at a conference as a CSA representative without permission.

- behaving responsibly with respect to health and safety in our work environment and that of our colleagues;
- participating in health and safety prevention, information and training sessions;
- using work resources, property and time wisely, in accordance with the applicable collective agreements or the conditions of employment established by the employer;
- respecting intellectual property, pursuant to the applicable laws, regulations and policies;
- maintaining a secure computing environment; and
- ensuring sound management of documents.

**Failing to provide stewardship includes**

- making illegal or unacceptable use of electronic networks;
- inappropriately using public money; and
- mismanaging our time or the property and resources entrusted to us.

## 2.5 Excellence

Excellence in the design and delivery of public sector policy, programs and services is beneficial to every aspect of Canadian life. Engagement, collaboration, effective teamwork and professional development are all essential to a high-performance organization.

**Public servants shall demonstrate professional excellence by**

- providing fair, timely, efficient and effective services that respect Canada's official languages;
- continually improving the quality of policies, programs and services they provide; and
- fostering a work environment that promotes teamwork, learning and innovativeness.

**At the CSA, demonstrating excellence includes**

- performing well by demonstrating competence and professionalism;
- having excellent job knowledge and keeping it up to date;
- encouraging and promoting retraining, professional development and ongoing learning; and
- maintaining a professional image and wearing appropriate attire in the workplace.

**Failing to demonstrate excellence includes failing to**

- make time to acquire knowledge that could improve the quality of your work;
- provide service in both official languages when your position requires it; and
- follow CSA communications management protocols (media relations, spokesperson responsibilities, corporate identity management, etc.).

## VALUES SPECIFIC TO THE CSA

### 2.6 Collaboration

At the CSA, collaboration means pooling the efforts, competences and talents of various individuals in order to effectively meet our organizational objectives, both in the same work unit and across various units of the organization. This collaboration occurs in the context of respectful, positive relationships based on the interests and needs of the organization and the various internal and external partners (e.g. other departments, international space agencies, the industry, universities).

We CSA employees and public servants shall demonstrate the spirit of collaboration by

- identifying needs and opportunities for collaboration between sectors and/or external partners in order to pool our competencies, knowledge,

talents and abilities and align our actions with common CSA-specific interests while ensuring that the interests of Canadians are served;

- recognizing that, while management is responsible for clarifying our roles and responsibilities, we are each responsible for ensuring that we fully understand our roles and responsibilities and fulfil them;
- formally and informally recognizing the contributions of each partner;
- openly and adequately sharing relevant information; and
- treating others with fairness and dignity even in their absence.

**Failing to demonstrate collaboration includes**

- knowingly keeping to ourselves relevant information that could help our colleagues, managers and partners do their work more effectively and meet their organizational objectives; and
- using denigrating and disrespectful language towards our partners, whether present or absent, in meetings or any other work context.

## 2.7 Inclusiveness

Demonstrating inclusiveness means adhering to diversity values and applying the principles of non-discrimination and employment equity. In other words, it means attaching value to people's various talents and viewpoints, regardless of their age, gender, ethnic origin or reporting level, and recognizing that inclusiveness is essential to achieving our objectives with excellence; seeking and highlighting each person's contributions and input; creating a work environment that encourages all persons to participate and do their part while respecting ideas and opinions that differ from their own; and recognizing differences and striving to reach a consensus when making decisions while respecting each person's roles and responsibilities and abiding by decisions made by authority figures.

We CSA employees and public servants shall demonstrate inclusiveness by

- soliciting the viewpoints of various individuals and groups, and expressing our point of view;

- respecting and being open to viewpoints, ideas and opinions that may differ from our own;
- eliminating all stereotypes relating to gender, race or ethnic origin in verbal, written and electronic communications; and
- establishing and maintaining a work environment free of discrimination, harassment and violence.

**Failing to demonstrate inclusiveness includes**

- talking about people rather than ideas and spreading gossip; and
- passing judgment on the quality of the work produced by our colleagues, managers and partners on the basis of their age, level of education, position level, ethnic origin, etc.

## 2.8 Innovativeness

Like collaboration, innovativeness is a key component of the CSA's mission. With regard to the CSA's mission, the objective of innovativeness is to be at the forefront of the development and application of space knowledge for the benefit of Canadians. Innovativeness is the ability to use our knowledge, understanding, creativity, flexibility and critical thinking to develop new applications, procedures, processes and technology in all the spheres of activity that help the CSA fulfil its mandate.

We CSA employees and public servants shall seek to identify new and better ways to achieve our objectives by

- fostering an open environment while encouraging our colleagues and partners to share new ideas, which are evaluated objectively, based on their applicability and effectiveness in relation to the CSA's mandate;
- keeping abreast of new technological, scientific, administrative or management knowledge and trends in order to optimize our work methods and results in our ongoing activities;
- promoting creative thinking while emphasizing innovativeness and expected outcomes; and

- monitoring, identifying and presenting to management the latest advances in order to optimize and develop new work methods, contributing to the decision-making process.

**Failing to be innovative includes**

- doing our work without listening to new ideas presented by our peers, employees and/or partners, which could allow us to do things in a better, more effective way; and
- not seeking to increase our knowledge of new trends, tools and methods in the context of our activities.

## 2.9 Well-being

Well-being in the workplace is fundamental to high-performance organizations because its employees' input is essential to fulfilling its mission. Promoting and adopting all the other values of the public sector and the CSA are the key to achieving well-being at work, on both an individual and organizational level. Well-being is therefore a responsibility shared by the individual and the organization, and is a prerequisite for high-performance organizations.

We CSA employees and public servants shall commit to promoting well-being in the workplace through all our actions and behaviours at work by

- exercising diligence and judgment in potential conflicts of interest;
- displaying the expected behaviours for each value in the Code; fostering and maintaining well-being in the workplace by respecting the letter and spirit of the Code;
- ensuring that we manage our time effectively to maintain balance and promote well-being;
- seeking to achieve work-life balance (managers must be open, sensitive and receptive while referring to the collective agreements, policies and regulations in effect);

- encouraging thoughtful, useful acts that contribute to work performance and the work environment; and
- helping to create and maintain a healthy, welcoming, respectful and trusting work environment.

**Failing to promote well-being includes**

- acting in contravention of the letter and spirit of the Code.

## 2.10 Accountability

CSA employees must be able to account for their actions and decisions while carrying out their duties in accordance with the applicable laws, policies, directives and codes.

We CSA employees and public servants shall demonstrate accountability by

- making decisions with the interests of the organization in mind, preferably while striving to reach a consensus and providing strategic direction (leaders);
- respecting decisions made by authority figures and helping to ensure that they come to fruition;
- demonstrating thoroughness, independence and diligence, and working constructively to meet the organization's objectives;
- ensuring that we are able to account for our actions and decisions, based on the values of the Code;
- helping to enhance the CSA's image and reputation: we are subject to the duty of loyalty and must exercise caution and restraint to ensure that we do not threaten the impartiality, integrity or neutrality of the public service while carrying out our duties;
- taking responsibility for our decisions, words and actions;
- being impartial and fair when choosing scientific and technical projects that align with our mandate and mission, and being fully aware of the need to manage these projects responsibly;

- avoiding any type of real or apparent conflict of interest between employees who have contractual, scientific or technical authority at the CSA and external partners/suppliers; and
- adopting behaviour that protects our environment for current and future generations, which means minimizing our consumption of energy, office supplies (especially paper), cleaning products and potable water at work and when travelling, and disposing of waste and electronic waste in a responsible manner.

**Failing to demonstrate accountability includes**

- refusing to take responsibility for our words and actions; and
- refusing to respect the decisions made by authority figures.

# 3. AVENUES FOR RESOLUTION AND RESOURCES

Fulfilling and conforming to the expectations set out in the CSA Organizational Values and Ethics Code is, first and foremost, an individual responsibility that belongs to each employee.

If, while carrying out our duties or conducting external activities, we are unsure as to whether our behaviour complies with the Code, we must exercise vigilance and judgment while ensuring that we adhere to the Code.

We can discuss, and alleviate, our concerns with our immediate supervisor or manager. We can also consult the resources listed in the reference section below, as needed.

In terms of values and ethics, dilemmas, doubts and value conflicts are inevitable. Open dialogue is encouraged to ensure that we uphold the values, and display the associated expected behaviours, set out in the Code. CSA employees at all levels are expected to resolve conflicts in a fair and respectful manner and consider informal processes, such as dialogue or mediation.

The Code was designed to guide our actions as CSA employees and public servants. However, it cannot possibly cover all the situations which may arise in the performance of our duties.

In cases not covered by the Code, we must determine the appropriate action to take by exercising judgment and basing our decisions on the values of the public sector and the organization.

The following questions may help you make good decisions and act in accordance with expectations:

- Are my actions legal and do they comply with CSA and Treasury Board Secretariat policies?
- Are my actions consistent with the values of the CSA and the public sector?

- What are the consequences of the action I am about to take or the decision I am about to make?
- How might the media or the general public perceive this measure or decision?

Remember that

- if you think or realize that your behaviour might go against the Code, it is most likely inappropriate, and you are better off changing your behaviour. When in doubt, ask questions and make sure they are answered.

The following is an exhaustive list of available resources:

Senior Officer Responsible for Disclosure of Wrongdoing

The Senior Officer Responsible for Disclosure of Wrongdoing is responsible for receiving information on acts allegedly committed at work, conducting investigations and making recommendations for action to our President.

Departmental Officer for Conflict of Interest and Post-employment Measures

The Departmental Officer for Conflict of Interest and Post-employment Measures is responsible for providing advice on and implementing conflict of interest and post-employment measures.

Senior Officer Responsible for Values and Ethics

The Senior Officer responsible for Values and Ethics is responsible for interpreting the CSA's Organizational Values and Ethics Code.

Departmental Coordinator for the Prevention and Resolution of Harassment in the Workplace

The Departmental Coordinator for the Prevention and Resolution of Harassment in the Workplace is responsible for harassment prevention and resolution initiatives at the CSA and coordinating the complaint process.

CSA Designated Political Activities Representative

The Designated Political Activities Representative is responsible for providing advice and guidance on political activities and acting as a liaison between the CSA and the Public Service Commission (PSC) responsible for administering the political activities regime.

## CSA Values and Ethics Committee

This committee is responsible for coordinating, planning, developing, implementing, communicating and monitoring values and ethics activities, policies and guidelines at the CSA in order to provide a forum for ethical issues. The Committee also helps to achieve results, ensures that values and ethics are an integral part of our decision-making process and prepares reports and action plans relating to values and ethics activities for the CSA's Executive Committee.

In addition to the various departmental officers and senior officials who have specific responsibilities pertaining to values and ethics, the Committee is composed of representatives from each of the CSA branches, who employees can approach with values and ethics questions, comments or suggestions they would like to see addressed.

## Health And Safety

Through the values of respect for people, well-being, stewardship and accountability, the Code outlines our responsibilities and obligations with regard to health and safety.

The CSA's equipment, facilities and services pose potential risks to the health and safety of the organization's employees.

That is why we must all behave responsibly with respect to our health and safety and that of our coworkers.

To do so, we must

- apply the work methods and safety rules specific to our work area;
- display appropriate behaviour in order to protect our health and safety and that of our work colleagues;
- actively participate in health and safety prevention, information and training sessions; and
- report any situation that could pose a risk to our health and safety and that of our work colleagues.

In doing so, we respect ourselves and others. For more information, you can also consult Part II of the Canada Labour Code.

CSA Policy Health and Safety Committee

This committee is responsible for examining health and safety issues at the CSA.

CSA workplace health and safety committees

Employer and employee representatives on these committees are responsible for working together to prevent work-related accidents and illnesses.

CSA National Union-Management Consultation Committee (NUMCC)

The purpose of this committee is to allow the employer and bargaining agents to discuss information and obtain feedback and advice on workplace issues. The issues discussed by the committee members pertain to the entire CSA.

St-Hubert Regional Labour-Management Consultation Committee (SHRLMCC) and Ottawa Regional Labour-Management Consultation Committee (ORLMCC)

These are standing committees of the CSA National Union-Management Consultation Committee. The issues discussed by the committee members

pertain to the region represented by the committee. The committees are composed of employer and employee representatives from those regions.

CSA Employment Equity Advisory Committee

This committee is responsible for facilitating the creation of a work environment conducive to diversity management.

CSA Women in Science, Technology and Management Committee

This committee is responsible for embracing and promoting inclusiveness. Its mission is to promote a work ethic and best practices that ensure optimal performance for women in the workplace and help achieve better representation of women in management and executive positions.

**Training**

Available or upcoming values and ethics courses, workshops are designed to ensure a common understanding of the values of the public sector and the CSA and facilitate their application.

## APPENDIX I

### Policy on Conflict of Interest and Post-Employment

Public servants contribute in a fundamental way to good government, democracy and Canadian society through the loyal, impartial and non-partisan support they provide to the elected government and through the service they provide to Canadians. As specialized professionals, they serve the public interest and uphold the public trust.

The Policy on Conflict of Interest and Post-Employment elaborates on the Values and Ethics Code for the Public Sector and is aligned with its content. It provides direction and measures to help organizations and public servants effectively deal with real, potential and apparent conflicts of interest, which may arise during and after employment in the public service. Preventing, managing or resolving conflicts of interest is one of the principal means of maintaining public trust and confidence in the impartiality and integrity of the public service.

Do you have a conflict of interest?

A conflict of interest exists when we are placed in a situation where we risk furthering our own interests before those of the public or the CSA.

We must therefore avoid putting ourselves in any real, potential or apparent conflicts of interest. We are responsible for meeting the requirements of the Policy on Conflict of Interest and Post-Employment both at work and outside work.

The following should be taken into consideration:

- external activities and employment;
- reportable assets;
- participation on the board of directors of organizations that deal with the CSA;
- participation in networking activities;

- participation in political activities;
- gifts, hospitality or other benefits;
- preferential treatment;
- staffing or financial decisions;
- activities or employment engaged in after leaving the public service.

When is there an apparent conflict of interest?

A conflict of interest exists when a situation might be perceived as a conflict of interest, even though there is no real conflict of interest.

Therefore, when a relatively well informed person could conclude that we are carrying out our duties on the basis of our personal interests or the interest of our friends and family, there is an apparent conflict of interest. Managers must disallow any action that could be perceived as an apparent conflict of interest. Employees must inform their supervisor, through a confidential report, of any role, activity or duty they are carrying out outside the CSA and of any assets or interests that are likely to influence or could be perceived as influencing their decisions in the performance of their duties.

We must also be objective and impartial when making decisions involving staffing, contract award or project operations.

Each individual is responsible for taking the measures required to recognize, prevent, report or resolve any real, apparent or potential conflicts of interest between our official and personal responsibilities.

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| Contract Number / Numéro du contrat |
|---|
| 9F044-190433 20190433 |
| 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 | **Canadian Space Agency (CSA)** | 2. Branch or Directorate / Direction générale ou Direction **Space Utilization Branch** |
| 3. a) Subcontract Number / Numéro du contrat de sous-traitance **NOT APPLICABLE** | 3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant **TBD** | |

4. Brief Description of Work / Brève description du travail

Flight Operations and Data Management Services for current Canadian missions (SCISAT, NEOSSAT, M3MSAT, RCM) as well as future missions

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

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

| | | |
|---|---|---|
| 6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS ? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c) | ☐ No / Non | ☒ Yes / Oui |
| 6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes ? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé. | ☒ No / Non | ☐ Yes / Oui |
| 6. c) Is this a commercial courier or delivery requirement with **no** overnight storage? S'agit-il d'un contrat de messagerie ou de livraison **sans** entreposage de nuit? | ☒ No / Non | ☐ Yes / Oui |

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

| **Canada** ☒ | **NATO / OTAN** ☐ | **Foreign / Étranger** ☐ |
|---|---|---|
| 7. b) Release restrictions / Restrictions relatives à la diffusion | | |
| No release restrictions / Aucune restriction relative à la diffusion ☒ | All NATO countries / Tous les pays de l'OTAN ☐ | No release restrictions / Aucune restriction relative à la diffusion ☐ |
| Not releasable / À ne pas diffuser ☐ | | |
| Restricted to: / Limité à : ☐ | Restricted to : Limité à : ☐ | Restricted to : Limité à : ☐ |
| Specify country(ies) : / Préciser le(s) pays : | Specify country(ies) : / Préciser le(s) pays : | Specify country(ies) : / Préciser le(s) pays : |

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

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

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**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 ?
If Yes, indicate the level of sensitivity :
Dans l'affirmative, indiquer le niveau de sensibilité: **SECRET**

☒ No / Non ☐ Yes / Oui

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 / Non ☐ Yes / 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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☒ | RELIABILITY STATUS<br>COTE DE FIABILITÉ | ☐ | CONFIDENTIAL<br>CONFIDENTIEL | ☒ | SECRET<br>SECRET | ☐ | TOP SECRET<br>TRÈS SECRET |
| ☐ | TOP SECRET – SIGNIT<br>TRÈS SECRET - SIGNIT | ☐ | NATO CONFIDENTIAL<br>NATO CONFIDENTIEL | ☐ | NATO SECRET<br>NATO SECRET | ☐ | COSMIC TOP SECRET<br>COSMIC TRÈS SECRET |
| ☐ | SITE ACCESS<br>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 / Non ☐ Yes / Oui

If Yes, will unscreened personnel be escorted?
Dans l'affirmative, le personnel en question sera-t-il escorté?

☐ No / Non ☐ Yes / Oui

**PART C – SAFEGUARDS (SUPLIER) / 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 / Non ☒ Yes / 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 / Non ☐ Yes / 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?

☒ No / Non ☐ **Yes / 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?

☐ No / Non ☒ Yes / 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 ministère ou de l'agence gouvernementale?

☒ No / Non ☐ Yes / Oui

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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 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | PROTECTED PROTÉGÉ | | | | | |
| | A | B | C | CONFIDENTIAL CONFIDENTIEL | SECRET | TOP SECRET TRÈS SECRET | NATO RESTRICTED NATO DIFFUSION RESTREINTE | NATO CONFIDENTIAL NATO CONFIDENTIEL | NATO SECRET | COSMIC TOP SECRET COSMIC TRÈS SECRET | A | B | C | CONFIDENTIAL CONFIDENTIEL | SECRET | TOP SECRET TRÈS SECRET |
| Information / Assets Renseignements / Biens | X | X | | | | | | | | | | | | | | |
| Production | | | | | | | | | | | | | | | | |
| IT Media / Support TI | X | X | | | | | | | | | | | | | | |
| IT Link / Lien électronique | | | | | | | | | | | | | | | | |

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

☒ No / Non ☐ Yes / Oui

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

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

☒ No / Non ☐ Yes / Oui

**If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).**
**Dans l'affirmative, classifier le present 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).**

## PART D – AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

| Name (print) – Nom (en lettres moulées) | Title – Titre | Signature | |
|---|---|---|---|
| **GUENNADI KROUPNIK** | **RCM PROJECT MANAGER** | | |
| Telephone No. – N° de telephone | Facsimile No. – N° de télécopieur | E-mail address – Addresse courriel | Date |
| **450-926-4614** | N/A | **guennadi.kroupnik@canada.ca** | 26 NOV. 2019 |

14. Organization Security Authority / Responsable de la Sécurité de l'organisme

| Name (print) – Nom (en lettres moulées) | Title – Titre | Signature | |
|---|---|---|---|
| **ANNIE DESROCHERS** | **A/ Departmental Security Officer (CSA)** | | |
| Telephone No. – N° de telephone | Facsimile No. – N° de télécopieur | E-mail address – Addresse courriel | Date |
| **450-926-6448** | 450-926-4885 | **annie.desrochers@canada.ca** | 2019/11/27 |

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?
Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes ?
☐ No / Non ☒ Yes / Oui

16. Procurement Officer / Agent d'approvisionnement

| Name (print) – Nom (en lettres moulées) | Title – Titre | Signature | |
|---|---|---|---|
| **Caroline Niquette** | | | |
| Telephone No. – N° de telephone | Facsimile No. – N° de télécopieur | E-mail address – Addresse courriel | Date |
| | N/A | | |

17. Contracting Security Authority / Autorité contractante en matière de sécurité

| Name (print) – Nom (en lettres moulées) | Title – Titre | Signature | |
|---|---|---|---|
| Telephone | | dresse courriel | Date |

*Paul Lepinski*
Agent à la Sécurité des contrats | Contract Security Officer
Programme de la Sécurité des contrats | Contract Security Program
Téléphone : 613 957-1294 | *paul.lepinski@tpsgc-pwgsc.gc.ca*

**UNCLASSIFIED**

# RADARSAT Constellation Mission (RCM)
# and
# Project Polar Epsilon 2 (PE2)

# SECURITY CLASSIFICATION GUIDE

**Canadian Space Agency**

**&**

**Department of National Defence**

April 11, 2019

## Table of Contents

# 1 INTRODUCTION

## 1.1 PURPOSE

The RCM and PE2 Security Classification Guide (SCG) is a working document that guides the Canadian Space Agency (CSA), the Department of National Defence (DND) as well as other agencies/organizations involved in the handling of classified information related to the RCM and PE2 capability. This SCG has been written to provide classification guidance for the RCM and PE2 projects based on information that is most likely to be encountered in the design, development, operations and maintenance phases of these projects. It is not intended to be an exhaustive document covering all aspects of security for RCM and PE2 projects and does not relieve anyone from complying with the Government of Canada (GC) directives on security. If a discrepancy exists between this document and a GC directive, the GC directive will have precedence.

## 1.2 DOCUMENT CONVENTIONS

This SCG is unclassified.

## 1.3 ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **A** | |
| AIS | Automatic Identification System |
| **C** | |
| CCD | Canadian Cryptographic Doctrine |
| CCI | Controlled Cryptographic Item |
| CDS | Cross Domain Solution |
| CFU | Cryptographic Flight Unit |
| CGU | Cryptographic Ground Unit |
| CICA | CSE Industrial COMSEC Account |
| COMSEC | Communications Security |
| cPE2 | Classified Polar Epsilon 2 system |
| CSE | Communications Security Establishment |
| CSNI | Consolidated Secret Network Infrastructure |
| CSS | Common Subsystem |
| **E** | |
| EODMS | Earth Observation Data Management System |
| **F** | |

| | |
|---|---|
| F/W | Firewall |
| **G** | |
| GC | Government of Canada |
| **H** | |
| HTTPS | Hypertext Transfer Protocol Secure |
| **I** | |
| IDS | Intrusion Detection Systems |
| ISM | Industrial Security Manual |
| IT | Information Technology |
| ITSD | IT Security Directive |
| **K** | |
| KEK | Key Encryption Keys |
| **L** | |
| LEOP | Launch and Early Operations Phase |
| **O** | |
| O/S | Operating System |
| OHS | Order Handling Subsystem |
| **P** | |
| PCF | Primary Control Facility |
| PE2 | Polar Epsilon 2 |
| PKI | Public Key Infrastructure |
| **R** | |
| RCM | RADARSAT Constellation Mission |
| **S** | |
| SAR | Synthetic Aperture Radar |
| SCG | Security Classification Guide [this document] |
| SDAC | Science Data Access Control |
| STE | Secure Terminal Equipment |
| STM | S-Band Telemetry |
| **T** | |

| | |
|---|---|
| TC | Telecommand |
| TEK | Traffic Encryption Keys |
| **U** | |
| uPE2 | Unclassified Polar Epsilon 2 system |
| UNTEK | Unclassified Traffic Encryption Keys |
| **V** | |
| VRF | Virtual Routing and Forwarding |
| **X** | |
| XTM | X-Band Telemetry |

## 1.4 DEFINITIONS

| Term | Definitions |
|---|---|
| Cryptographic Flight Unit (CFU) | The CSE approved cryptographic unit on-board the RCM satellite which encrypts/decrypts the TeleCommand (TC), S-Band Telemetry (STM) and X-Band Telemetry (XTM) communication links. |
| Cryptographic Ground Unit (CGU) | The CSE approved cryptographic unit used in a ground facility to decrypt/encrypt the TC, STM and XTM communication links. |
| Data | Any information that is used by personnel, ground segment equipment/systems or space segment equipment/systems for interpretation, transmission, configuration, insight, calculations or in support of activities of any kind. |
| Information | Value-added facts which are used to convey meaning or particulars about a specific element. Information can be electronic, physical or verbal. |

| Term | Definitions |
|---|---|
| LEOP | The Launch and Early Orbit Phase (LEOP) of the RCM mission is the phase during which each RCM spacecraft is launched into its initial orbit, its essential systems activated and checked-out, and a sequence of events carried out which will place the spacecraft in an orbit, attitude and configuration suitable for the commencement of activities that ready the spacecraft for routine operations. The official start of each LEOP campaign is considered to begin at Launch Readiness Review, and is considered complete when LEOP performance criteria (such as deployment of Solar panel SAR antennas and AIS Antenna, etc….) are met and a successful Go/No-Go meeting is held. |
| Science Data | Data included in the X-Band signals transmitted by the RCM Spacecraft. This data includes Payload Data (raw SAR, raw AIS and OBP AIS) from the Payload and Ancillary Data from the Bus which is subdivided into Bus Ancillary Data (spacecraft time, attitude and positional information), Payload Ancillary Data (payload telemetry and pass-through data derived from the Activity Requests received from the Payload) and Image Ancillary Data (time and pulse setting information with associated echo and replica data packets). |
| Metadata | Additional information associated with the Science Data for the purposes of creating and archiving image products which can include: geographic extents of the data, processing parameters, Downlink Segment ID, catalogue update and visibility restrictions etc. |

| Term | Definitions |
|---|---|
| Order data | The content of specific Order fields when considered individually are considered UNCLASSIFIED. When Classified Order contents are considered in sub-combinations these are UNCLASSIFIED if those Order contents do not contain all of the following: Order Classification, Identification of the geographical area of interest and the time period within which the Science Data must be collected. Once a classified Order is submitted the aggregate of all the information contained in that Order is considered SECRET. |

### 1.5 DOCUMENTS CONVENTIONS

In the context of this document, the following words have the specific meaning indicated:

a) "must" is used to indicate a mandatory requirement.

b) "should" is used to indicate a preferred alternative that is not mandatory.

c) "may" is used to indicate an option.

d) "will" is used to indicate a statement of intention or fact.

## 2 DOCUMENTS

### 2.1 REFERENCE DOCUMENTS

**TABLE 1: REFERENCE DOCUMENTS**

| RD No. | Document Title | Link |
|---|---|---|
| 1. | Security of Information Act http://lois-laws.justice.gc.ca/eng/acts/O-5/index.html | Sec of Inf Act |
| 2. | The Government of Canada (GC) Policy on Government Security (PGS), Date modified 2012-04-01 http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16578&section=text | PGS |
| 3. | IT Security Directive for the Application of Communications Security Using CSE-Approved Solutions (ITSD-01A) https://www.cse-cst.gc.ca/en/system/files/pdf_documents/itsd01a-eng_0.pdf | ITSD-01A |

| RD No. | Document Title | Link |
|---|---|---|
| 4. | IT Security Directive for the Control of COMSEC Material in the Government of Canada (ITSD-03A), Effective date March 2014 https://cse-cst.gc.ca/en/node/1264/html/22979 | ITSD-03A |
| 5. | IT Security Directive for the Control of COMSEC Material in the Canadian Private Sector (ITSD-06A) https://www.cse-cst.gc.ca/en/system/files/pdf_documents/itsd-06a-eng_0.pdf | ITSD-06A |
| 6. | IT Security Directive for the Ordering of Cryptographic Key (ITSD-09) Note: ITSD-09 will be released imminently. | ITSD-09 |
| 7. | RCMP G1-001 - Security Equipment Guide (Access is **restricted** to Government of Canada departments and agencies) | |
| 8. | RCMP Guide G1-009, Standard for the Transport and Transmittal of Sensitive Information and Assets *(Access is **restricted** to Government of Canada departments and agencies)* | |
| 9. | Industrial Security Manual http://www.tpsgc-pwgsc.gc.ca/esc-src/msi-ism/index-eng.html | ISM |
| 10. | National Defence Security Orders and Directives (NDSOD) (available on demand through PE2) | |
| 11. | Controlled Goods Program https://www.tpsgc-pwgsc.gc.ca/pmc-cgp/index-eng.html | CGP |
| 12. | COMSEC Material Control Policy, Standards and Procedures (INFOSEC (2E)) http://admim-smagi.mil.ca/assets/IM_Intranet/docs/en/security/comsec/infosec-2e.pdf | (INFOSEC (2E) |
| 13. | Operational Security Standard on Physical Security https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12329 | Operational Security Standard on Physical Security |
| 14. | Harmonized Threat and Risk Assessment Methodology (HTRA) (https://cyber.gc.ca/sites/default/files/publications/tra-emr-1-e.pdf | HTRA |

# 3 CATEGORIZATION

The highest level of classification for the RCM system and Polar Epsilon 2 Classified System (cPE2) is SECRET. It is the Crown's responsibility to determine the criteria for the classification and declassification of information for the RCM and the Polar Epsilon 2 systems. The originator of the material (document Owner) is responsible for its classification/declassification based on this SCG. If an originator suspects that some information/data is not covered by this SCG, that originator must contact their local RCM or PE2 authority to determine if the SCG should be amended; industrial personnel must communicate via their Company Security Officer iaw the ISM while GC personnel may contact those authorities directly.

# 4 CLASSIFICATION

Personnel must classify information in accordance with Canadian Policies. Airbus referenced documentation will be classified according to the applicable RCM and/or PE2 contracts.

There are two (2) main types of sensitive information designations used by the Government of Canada: Classified and Designated. The access and protection of both types of information is governed by the Security of Information Act (RD-01). To access the information, a person must have the appropriate level of clearance and a need to know.

The Policy on Government Security (PGS) (RD-02) gives directions to effectively manage security activities within departments and contribute to effective government-wide security management.

# 5 GUIDELINES

## 5.1 General

The Government of Canada's RCM satellites and ground system, through the cPE2, will provide a capability to generate and use information up to SECRET level for space-based surveillance and reconnaissance purpose. The cPE2 will order, receive, process, exploit, disseminate and archive RCM Synthetic Aperture Radar (SAR) data at a classified level of up to SECRET.

Most of the RCM data will not be sensitive (i.e. it will be UNCLASSIFIED). However, there could be instances where a combination of contextual circumstances and acquisition parameters would have RCM generate orders, remote sensing data and/or metadata that would contain sufficiently sensitive information to meet the injury test leading to the classification at a SECRET level and a requirement to protect the data accordingly. In these circumstances the originators of the acquisition request(s) are responsible to ensure they are submitted using the cPE2 capability vice uPE2. For example, this may happen through:

I. DND's nominal usage plans; or
II. Exceptional and unforeseen circumstances situations where RCM could be used in a national or international security context such as in support of theater of operations of the Canadian Armed Forces or those of our close allies and partners.

RCM is a highly valuable National Security asset. As such GC stakeholders have also determined that these assets warrant tight security measures to ensure continued positive control, health and safety of the spacecraft that form part of RCM. Hence security measures have been added to protect the integrity and availability of telecommand and telemetry data to and from the spacecraft.

Unless specified in this SCG, all hardware, software, documentation and algorithm components of the RCM and PE2 systems are UNCLASSIFIED except for the CGU/CFU design[1]. Further guidance about the classified Acquisition Mask security classification is provided in section 5.6.

All unclassified hardware and software that has been exposed to classified data becomes classified to the highest level of that data. Classified hardware and software will always be classified regardless of whether it has been exposed to classified data through or not. If information (i.e. operational data) is required to be declassified to support debugging or anomaly resolution, it will be done so by the respective data owner (CSA or DND).

### 5.2 Handling of classified information:

SECRET information must be treated with appropriate measures approved by the GC directives.

SECRET documents are not based on the type of document (e.g. Design document, Test procedure and reports, validation reports) but rather on the nature of the information that it contains. Most of the baseline design of cPE2 is derived from unclassified PE2 and RCM documentation. Instances of cPE2 and RCM design which are classified will be delivered to Canada in a separate document, classified appendix or an equivalent, as long as the resulting combination of documents is usable by Canada for the purposes it is delivered for. If separation of classified and unclassified information would make the document unusable by Canada, it must be delivered in a combined form. In some special cases, a document initially provided to RCM will require updates that may include a small amount of classified information. In these cases, the initial document may retain the original classification but provide the classified content as a classified

[1] From CSE: The crypto will be at the classification of the highest classification of key or data on the crypto. For CGU-X, the classification of the unit is unclassified when powered off and then subsequently powered on again – until key is loaded and data processed for the first time. For testing, it will be CCI unclassified.

addendum. Consequently, the documents without the classified addendum should be marked “UNCLASSIFIED without attachment” but with the addendum, the document becomes classified to the highest security classification of the addendum included and should be marked appropriately. The addendum should also be clearly marked with its security classification.

NOTE: An unclassified document may refer to a separate classified document, so long as the fact of the existence of that classified document is UNCLASSIFIED and no classified reason for accessing that other document is given. (For example: The reason given for accessing a classified document must not state that the vulnerabilities/weaknesses are given in that classified document, as that identifies the fact that there is a classified vulnerability.)

### 5.3 Confidentiality

The following statements provide high-level guidance on the RCM and PE2 capability:

The fact that a classified order can be placed for classified RCM SAR data is UNCLASSIFIED.

The fact that satellites can downlink classified data is UNCLASSIFIED.

The fact of the existence of the classified portion of RCM and cPE2 is UNCLASSIFIED.

The overall design and associated documentation of the RCM and PE2 is UNCLASSIFIED, with certain exceptions that is either Protected or Classified. Classification of document is done on a document-by-document basis, for example the RCM Key Management Support Plan is classified.

The fact of the existence of contracts for the design, implementation, operation and maintenance of the classified portion of RCM and of cPE2 is UNCLASSIFIED. The contents of these contracts will be UNCLASSIFIED, unless it is necessary to include classified material in the contracts; if so, only the classified contents will be classified, though the contract documents will be properly marked to reflect the fact that the contract contains classified material.

The existence of each classified order being planned or placed is SECRET.

The list of authorized users that could request a classified order is SECRET. Format of the list is UNCLASSIFIED.

The processed products resulting from a classified order are SECRET, including images and ship detections.

Any intermediate products between decrypted classified Science Data and processed products are SECRET.

The cPE2 will provide a capability to declassify Science Data and to transfer it to the unclassified RCM archive. The fact that the Science Data has been declassified is UNCLASSIFIED.

All inter-facility connections making-up the RCM/PE2 VRF network will be protected to the level of Protected A. Inter-facility connection between cPE2 and cRCM network will be protected to the level of SECRET. Any hardware (i.e. encryptors) required to achieve SECRET level protection will be provided by the Government of Canada (i.e. DND or CSA).

### 5.4 Security Classification distinction beyond RCM ORR

For purpose of integration RCM GS subsystems are considered UNCLASSIFIED up to the point of the RCM Final Operational Readiness Review (ORR). Following the RCM ORR, RCM GS subsystems must assume their appropriate classification and physical security zoning will apply accordingly.

### 5.5 System design, testing and verification

RCM and PE2 Information kept at a high level may remain unclassified.

"High level" refers to schematics or information which show or describe the boundaries of a System or Subsystem, the inputs and outputs of the System or Subsystem, the surrounding interacting Systems or Subsystems, environment and activities, but which do not detail any of the internal structure. High level information can include relationships and interoperability with other Systems, Subsystems or groups on the understanding that explicit functional details are not included. High level also includes commercial product names and versions (if non-PE2/RCM specific) and applicable standards and guidelines when applied in accordance with industry best practices. Lower level information is unclassified except where specific criteria contained within the SCG require a SECRET classification.

"Vulnerability" is defined as "*A flaw or weakness in a system's design, implementation, or operation and management that could be exploited to violate the system's security policy*". A vulnerability is a weakness which allows an attacker to reduce an information system's confidentiality, integrity or availability.

The existence of a vulnerability that affect the classified RCM or cPE2 systems must be SECRET.

Verification, testing and integration of the RCM and PE2 development system can be conducted at the UNCLASSIFIED level. Documents, test plans, test results associated with the unclassified verification, testing and integration will also be UNCLASSIFIED.

Test results and reports with the defined purpose of discovering/disclosing potential vulnerabilities of RCM and PE2 classified or unclassified systems must be delivered in SECRET documents. Example – vulnerability assessment & penetration testing. Although portions of these reports may be UNCLAS, classification conventions of (U) and (S) will be observed within the document.

The knowledge of failures of certain items of unclassified testing of IT oriented requirements (i.e. CSS requirements) may be of serious enough importance to require classification of the test and its result. For example, a failure which can and would be fixed may be assessed a low risk of injury, however if serious concerns are identified as part of the injury assessment done in accordance with ITSG-33, Annex 2, Section 3.5.1., the procedures of the tests should be amended to provide additional controls. A mitigation to that problem could be to introduce a risk assessment activity prior to unclassified testing of IT being conducted. Test results and reports as part of the system test activities, that identify the existence of vulnerabilities in a deployed/operational instance of RCM and PE2 classified or unclassified systems must be marked as SECRET.

If during the course of a test, discussion, etc. it is believed that the relevant data is classified, then that data should be provided to the appropriate local authority who can assist in the classification. Such data may be provided in a separate classified document, appendix or addendum or an equivalent.
Example - If a test is run and the plaintext crypto key is visible. If the test is with development key, the test result/observations are NOT classified but there would be a vulnerability if Test or Operational key is used. Note that an operational key will NOT be used during a test.

Any test of or involving MPS which contains a mix of unclassified and classified software, must be conducted in an environment accredited at the SECRET level. If the classified software is not loaded, the MPS may be tested under unclassified conditions, so long as the processor(s) have not been previously used for classified processing or have previously contained classified software. Note that any medium containing the classified software is itself classified and its incorporation or use in a test or test configuration means that the test must be conducted in a location accredited to SECRET level.

The RCM Ground Segment (GS) and PE2 source code are UNCLASSIFIED.

The cPE2 network and its information systems architecture and the cross-domain solutions (CDS) design are classified SECRET and the testing of their classified elements of design is also SECRET.

Any aspect of training that include classified information, must be conducted in an appropriate secure location.

### 5.6 Classified Acquisition Mask

The classified Acquisition Mask is the proposed solution by the contractor to hide the existence of classified orders.

The facts that classified Acquisition Masks in general (and its function) exist are UNCLASSIFIED.

The process for the operator to build a classified Acquisition mask is UNCLASSIFIED.

The existence of classified Orders is classified SECRET. If Acquisition Masks are created to hide the classified Acquisition Orders during system operations, then specific Acquisition Masks and their associated data are SECRET.

The classified Acquisition Mask response logic, to ensure that users of the UNCLASSIFIED PE2 and RCM systems cannot be aware of existing classified Acquisition Masks and Orders when an order is placed via the uOHS within a classified Acquisition Mask, is UNCLASSIFIED. The entire response logic for the development is to be handled as UNCLASSIFED from concept, to source code, compiler, design and execution.

The design of the interfaces between the classified OHS and the classified Acquisition Mask response logic and between the classified Acquisition Mask response logic and the MPS is UNCLASSIFIED.

### 5.7 IT Security Architecture

All information concerning the design of the PE2 and RCM IT network is considered UNCLASSIFIED except the following:

- Design, implementation and configuration details of the RCM and PE2 Cross-Domain Solution – SECRET;
- Configuration of RCM Intrusion Detection Systems (IDS) – PROTECTED B;

- Configuration of uPE2 Intrusion Detection Systems (IDS) – PROTECTED B;
- Configuration of cPE2 Intrusion Detection Systems (IDS) – SECRET;
- Hostnames for uPE2 - UNCLASSIFIED if the naming convention obfuscates the purpose of the host. If this cannot be achieved, then the hostname should be treated as PROTECTED B. The hostname and detailed description of its purpose/function must NOT be published in an UNCLAS document
- Hostnames for cPE2 is SECRET;
- Aggregate of RCM IP addresses – PROTECTED B;
- Aggregate of uPE2 IP addresses – PROTECTED B;
- Aggregate of cPE2 IP addresses – SECRET;
- Configuration of uPE2 IP addresses – PROTECTED B;
- Configuration of cPE2 IP addresses – SECRET;
- Detailed design of RCM Out-Of-Band systems – PROTECTED B;
- Detailed configuration of RCM Operating System (O/S) hardening other than Industry best practices - PROTECTED B;
- Detailed configuration of uPE2 Operating System (O/S) hardening other than Industry best practices – PROTECTED B;
- Detailed configuration of cPE2 Operating System (O/S) hardening other than Industry best practices - SECRET;
- Configuration of RCM Firewalls (F/W) other than the Classified F/W – PROTECTED B; and,
- Configuration of PE2 Firewalls (F/W) other than the Classified F/W – PROTECTED B.
- Configuration of the RCM and PE2 Classified Firewall – SECRET;

### 5.8 Network security

The manufacturer and model of firewall units for the PE2 system is UNCLASSIFIED. The classification for the firewalls on the classified DND/CAF's CNET/CSNI network is SECRET.

Network Device configuration settings and Network Architecture Diagrams with IP addresses and context - SECRET for cPE2, PROTECTED B for uPE2.

## 6 OPERATIONAL TELEMETRY / TELECOMMAND

From just prior to the Polar Epsilon 2 classified System Verification Review where live (RED) crypto keys are loaded for classified orders and onwards, operational RCM telemetry / telecommand data are classified SECRET with the following exceptions:

a. when absolute time and/or position information is removed in accordance with the approved process. Note - The process will be captured in CSA-RC-PL-0081 RCM Process to remove sensitive data from Telemetry and

Telecommand Data (Protected B) and will include limiting the dataset to a maximum observation window defined by the Packet Classification Guide; or

b. the packets have been deemed to be UNCLASSIFIED in the Packet Classification Guide.

Irrespective of the timeframe the following telemetry/telecommand related to operational keys will need to be handled as SECRET:

• Some of the fields within the 64-bytes of the CFU Housekeeping Status Summary as listed in Section 6 of L1S0113981-ASTR - CFU Telecommand and Telemetry List (refer to Attachment 1); and

• Some of the fields within the 66-bytes of the CGU Health Status as listed in Section 9 of ICD-DG0114710-ASTR - RCM CGU Command and Monitor Interface Control.

Trending or averaging of telemetry data may be declassified in accordance with the approved process.

Simulated telemetry/telecommand data is considered unclassified.

# 7 O&M

Passwords, combinations, PINs and similar information are classified at the security level of the information or material that they protect but no less than PROTECTED B.

Maintenance information showing status of classified RCM and PE2 capability is UNCLASSIFIED.

O&M statistics for the cPE2 are UNCLASSIFIED.

Operations reports for the cPE2 are SECRET.

Operation reports for the uPE2 are UNCLASSIFIED.

System maintenance reports for the uPE2 and cPE2 are UNCLASSIFED unless it identifies a vulnerability as per Section 5.5.

# 8 DATA

The Science Data Access Control (SDAC) is considered PROTECTED B.

Science Data, metadata, order data or other data related to classified orders are SECRET.

The RCM Earth Observation Data Management System (EODMS) and all messages to and from this system are considered UNCLASSIFIED. The unclassified RCM Science Data archive and its contents are UNCLASSIFIED.

The raw Science Data resulting from a classified order is SECRET.

The classified RCM Science Data archive and its contents are SECRET. Any listing of these contents is SECRET.

AIS: The raw AIS data produced by the AIS sensor on board the spacecraft is deemed to be UNCLASSIFIED, but raw and OBP AIS data produced during the execution of a classified order must be handled as SECRET.

Classified Order data may only be entered in the classified OHS and its data is SECRET. The order template itself is UNCLASSIFED. The fields necessary to build a classified or unclassified order such as Time, Location, Beam mode, Customer reason for order are UNCLASSIFIED, however once a field is filled in with operational data for a classified order, it is SECRET. Prior to having any operational classified data flow through the cOHS, UNCLASSIFIED data can be created and entered in the classified OHS for UNCLASSIFIED testing purpose, the completed fields are UNCLASSIFIED and they must be identified as such in the order if it is possible. Note that each field does not need to be identified as UNCLASSIFIED but a predominant field to indicate the entire order is UNCLASSIFIED would meet this requirement.

Once classified operational data flow through the system, UNCLASSIFIED testing will no longer be possible as the system components (both hardware and software) have become classified to the highest level of the classified data. Software installed in the cOHS that was UNCLASSIFIED prior to the classified operational orders flow through becomes classified to the highest level of that data. UNCLASSIFIED software and/or updates can be uploaded in the cOHS but they will become classified to the same level as the software in the cOHS once installed.

Encrypted classified Science Data being transmitted in the black is to be treated as UNCLASSIFIED.

# 9 COMSEC

In order for the system to be designed, built and tested, the Contractor will require information about cryptographic systems, processes and test keys to integrate cryptographic systems, all up to the level of SECRET. The Contractor will not

require actual GC cryptographic keys, since those will only be kept and used under GC custody and control except for Secure Voice use in support of CPE2.

Cryptographic equipment (aka Controlled Cryptographic Item (CCI)) are controlled goods and must as a minimum be managed under the guidance of the Controlled Goods Program. Specifically, cryptographic equipment must be handled and managed iaw its associated Canadian Cryptographic Doctrine (CCD) issued by the Communication Security Establishment (CSE). Specific CCDs will be made available to the contractor via the CSE Industrial COMSEC Account (CICA) or DND.

CSE Reference documentation that should be reviewed are ITSD-01A and ITSD-06A (available at https://www.cse-cst.gc.ca/en/publication/list/).

### 9.1 Encryption Keys:

Keys will be required for the following systems: Phone (STE or OMNI), TACLANE, CFU, CGU-X and CGU-S. Discussion about encryption keys kept at a high level may remain UNCLASSIFIED. Development and test keys will be UNCLASSIFIED while operational keys will be classified SECRET.

Encryption Keys are to be handled and secured at the classification level of the key. Short Titles are UNCLASSIFIED. Long Titles are normally UNCLASSIFIED. For additional direction contact CICA.

RCM Crypto are of two types: Type 1 Crypto (CFU/CGU) or Commercial (software-based) crypto. Commercial crypto are UNCLASSIFIED in all cases. The CFU/CGU, when not keyed are UNCLASSIFIED, when keyed they are classified to the same level as the loaded key.

RCM Keys targeted for use on Type 1 Crypto are of three types based on their usage: Development keys, test keys and operational keys. Development keys are produced by the contractor (or sub-contractors); in all cases these are UNCLASSIFIED. Test keys are provided by CSE and are UNCLASSIFIED. There are two types of operational keys: the first type is the UNTEK and is UNCLASSIFIED and the other type is furnished by CSE and is classified SECRET.

Additionally, keys used with Type 1 Crypto can be subdivided into two groups based on their purpose: Traffic Encryption Keys (TEKs) and Key Encryption Keys (KEKs). Keys in the “clear” are as per the above paragraph. BLACK keys (TEKs encrypted with a KEK or KEKs encrypted with a KEK) are considered Protected A. The Protected A rule is a CSE rule (ITSD 03 Annex A).

A key in a BLACK state may be transmitted over any:
- Classified network

- Government of Canada departmental network that has been accredited to protect PROTECTED A or PROTECTED B information, or
- public network (e.g. the Internet), as long as it is protected minimally with Public Key Infrastructure (PKI) encryption or Hypertext Transfer Protocol Secure (HTTPS) encrypted connection.

RCM Keys targeted for use on Commercial-grade Crypto are UNCLASSIFIED in all cases.

Note: "Storage, Handling and Transportation of COMSEC material must be in accordance with ITSD-03A and ITSD-06A only."

## 10 MARKING AND LABELLING (other than COMSEC)

As per the NDSOD Chapter 6, SECRET documents and data products of PE2 must be labelled CAN SECRET.

**Security Warning for Contractor Produced Publications (Chap5 ISM)**

Unless otherwise specified in the contract, where a contractor is producing a publication on behalf of the Government of Canada that contains PROTECTED information, the following warning will be printed on both the front cover and title page:

**This publication contains PROTECTED information which must be safeguarded under the provisions of Canada's Government Security Policy. It has been produced by (contractor's name) under the provisions of (contract number or other authorization) on behalf of (the Government of Canada or department), as applicable. Release of this publication, or of any information contained herein, to any person not authorized by the originating agency to receive it is prohibited.**

All CLASSIFIED publications, pamphlets, handbooks or brochures which are produced by a contractor on behalf of the Government of Canada must have, in addition to the regular security classification markings as prescribed in this chapter, the following security warning on both the front cover and the title page:

**"This publication contains CLASSIFIED information affecting the national interest of Canada. It has been produced by (contractor's name) under the provisions of (contract number or other authorization) on behalf of (the Government of Canada or department, as applicable) and is to be safeguarded, handled and transported in accordance with Government Security Policy. Release of this publication, or of any CLASSIFIED information contained herein, to any person not authorized to receive it is prohibited by the Security of Information Act."**

The UK, Canadian and US standards for marking classified information are similar except for potential caveats. For the RCM and PE2, no caveat is required.

For non-classified information, the marking standards vary. Documents should be marked according to the nationality of origin and NOT re-classified or re-marked in any manner.

Canadian material marked “Protected A” should be handled in the UK as “Restricted” but not “UK Restricted”.

The following procedures are from the ISM Chap 5 (Marking) except for #9.

1. for PROTECTED information, mark the word "PROTECTED" in the upper right corner of the face of the document and where required, with the letter "A", "B" or "C" to indicate the level of safeguarding;
2. for SECRET information, mark the classification in the upper right corner of each document page;
3. mark covering or transmittal letters or forms or circulation slips to show the highest level of classification or protection of the attachments;
4. mark all materials used in preparing PROTECTED and CLASSIFIED information. Such material includes notes, drafts, carbon copies and photocopies;
5. the letters used in marking should be larger than those used in the text of the document;
6. in addition to marking individual pages as stipulated above, documents must be appropriately marked on the outside of both the front and back covers;
7. **loose documents** must be marked on every sheet;
8. **charts, maps, drawings, etc**. must be prominently marked near the margin or title block in such manner that the marking is clearly visible when the document is folded; and
9. Protective markings on paragraphs are known as paragraph grading indicators and may appear in brackets at the start of each paragraph. The protective marking can be written in full or abbreviated by the first letters of the markings and should be the same colour as the text within the document. For instance, (S/REL FVEY) for SECRET or (U) for UNCLASSIFIED.

# 11 PROCESSING OF SENSITIVE INFORMATION ON AN IT SYSTEM

In accordance with the Treasury Board policies on Government security, all Level II (SECRET and above) information technology systems must be operated within a security or high security zone. If classified processing is required but is not supported by the current SRCL, contact the applicable Contract’s Technical Authority.

# 12 STORAGE AND HANDLING

The storage and handling of PROTECTED and CLASSIFIED information and assets will be in accordance with the Industrial Security Manual (RD-16) for industry and in accordance with respective Departments directives for GC organizations.

When information is generated, reproduced, edited, viewed, processed, stored or otherwise accessed, consideration must be given to the security of the assets, equipment and environment where these activities will take place. Information must only be handled in physical security and electronic zones that are appropriate for the sensitivity of that information

# 13 TRANSPORT AND TRANSMITTAL

Sensitive information must be safeguarded when it is being physically transported from one location to another, and also when it is being transmitted across computer networks, phone lines or any other transmission medium.

Maintaining authorized access to protected and classified assets and valuables is paramount when being transported:

a. When transporting protected and classified assets from one person or place to another, safeguards must include controlling access to the information by need-to-know.
b. When transmitting protected and classified assets from one person or place to another, safeguards must depend on proper packaging, an appropriate and reliable postal or courier service (government or private sector) and the anonymity of the information while in transit.
c. The RCM users will ensure that protected and classified assets are transported or transmitted according to the minimum requirements set out in the Operational Security Standard on Physical Security document. (RD-13).
d. RCM users will refer to RCMP Guide G1-009, Standard for the Transport and Transmittal of Sensitive Information and Assets (RD-06) for detailed specifications for enveloping, addressing and courier services for transporting and transmitting protected and classified assets.
e. PE2 users will refer to NDSOD (RD-10), Security of Information Standards for detailed specifications for enveloping, addressing and courier services for transporting and transmitting protected and classified assets.

# 14 DISCLOSURE AND SHARING OF SENSITIVE INFORMATION

The security controls of the physical environment must be commensurate with the designation or classification of the information being discussed or shared.

When authorized and before sensitive information is shared, the custodian of the information must ensure that recipients of the information:

a. have an appropriate clearance for access to the information;
b. have a demonstrated need-to-know for the information;
c. are authorized to access the information, if said sensitive information was obtained through the means of a foreign export authorization; and
d. are aware of, understand, and have agreed to the safeguarding requirements for that information.

Like classification and protection, any sharing or disclosure of GC information should comply with the exemption and exclusion criteria of the Access to Information Act, and the Privacy Act.

## 15 DISPOSAL

The destruction of PROTECTED and CLASSIFIED information and assets will be in accordance with the Industrial Security Manual (RD-9) for industry and in accordance with respective Departments directives for GC organizations.

**ANNEX «D»**

**MANDATORY NON-DISCLOSURE AGREEMENT**

**CONCERNING SATELLITE FLIGHT OPERATIONS AND DATA MANAGEMENT SERVICES**

**REQUEST FOR PROPOSALS (RFP)**

**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA (PWGSC)**
**FILE NO. 9F044-190433/A**

**BETWEEN**

____, a body corporate duly incorporated under the laws of ____, having its Head Office located at ____, hereinafter "the Supplier";

**AND** HER MAJESTY THE QUEEN IN RIGHT OF CANADA, as represented by the Minister of Public Works and Government Services Canada, hereinafter "Canada"

The Supplier agrees that, for the purpose of preparing a response to PWGSC for the RFP (the Purpose), it is being given access to information that is confidential or proprietary to Canada or to third parties. The Supplier agrees to comply with the obligations referred to in this Agreement.

1. The Supplier acknowledges that the following documents must be handled in a confidential manner and must not be disclosed or used for purposes other than the RFP:

| ID | Number | Title |
|---|---|---|
| **AD-04** | | Canadian Space Agency Values and Ethics Organizational Code |
| **RD-01** | ST99-60/2019E-PDF | Exploration, Imagination, Innovation: A New Space Strategy for Canada |
| **RD-04** | CSA-RC-CO-0001 | Multi-Mission Operation Center (MMOC) Multi-Mission Antenna Reservation System (ARS) Concept of Operations |
| **RD-05** | CSA-RC-POL-0003 | RCM Computer Media Protection Policy |
| **RD-06** | CSA-RC-PR-0012 | Antenna Reservation System ARS Maintenance Procedure |
| **RD-07** | CSA-RC-PR-0011 | Antenna Reservation System ARS Operations Procedure |
| **RD-08** | | M3MSat Concept of Operations |
| **RD-09** | CSA-NEOSSat-CD-0001 | NEOSSat CONOPS |
| **RD-10** | CSA-NEOSSAT-RD-0009 | NEOSSat Grount Terminal and MOC Upgrade Requirements |
| **RD-11** | CSA-RC-RD-0002 | Mission Requirements Document (MRD) |
| **RD-12** | | Multi-Mission Manual Procedure List |
| **RD-13** | | RCM Operations Manual Procedure List |
| **RD-14** | RCM-DLR-OPS-7 | RCM Transponder Maintenance Manual |
| **RD-15** | RCM-DLR-OPS-6 | RCM Transponder User's Manual |
| **RD-16** | CSA-MM-PR-0005 | Satellite Operations Security Management MISSION CONTROL CENTER – SECURITY GUIDELINES |
| **RD-17** | OPS-N_MMT_ 4030_CCB_PROCEDURE | Configuration Control Board (CCB) procedure |
| **RD-18** | CSA-RC-PR-0020 | RCM Computer Systems Access Procedure |
| **RD-19** | CSA-RC-PL-0088 | RCM Phase E S&MA and CADM Implementation Plan |
| **RD-20** | ARS-TG-54-0168 | Multi-Mission Antenna Reservation System (ARS) Maintenance Training Presentation 2016-12-14 MDA-CSA |
| **RD-21** | ARS-MA-53-9648 | ARS Maintenance Manual |
| **RD-22** | RCM-SP-52-3334 | RCM Ground Segment Requirements Specification |
| **RD-23** | RCM-DD-52-8796 | Ground Segment Design Document |
| **RD-24** | ER_100942 | SCISAT-1 Operations Guide |

| | | |
|---|---|---|
| **RD-25** | ER100965 | SCISAT-1 Operations Course |
| **RD-26** | | NEOSSat System Training Material |
| **RD-27** | NEO.RP.DYN.EN.001 ENG01 | NEOSSat System Description |
| **RD-28** | NEO.IF.DYN.SY.001 | NEOSSat MOC to Spacecraft ICD |
| **RD-29** | | NEOSSat MPS User Manual |
| **RD-30** | | M3MSat Spacecraft to Ground ICD |
| **RD-31** | | M3MSat Mission Description Document |

2. For the purpose of this Agreement, Confidential Information includes but is not limited to, the above documents as well as any additional documents, instructions, guidelines, data, material, advice or information whether received orally, in printed form, recorded electronically or otherwise, and whether or not labelled as proprietary, that is disclosed to a person or entity or that a person or entity becomes aware of for the purpose of this RFP.

3. The Supplier agrees to neither copy nor publish the documents or disclose any Confidential Information, in whole or in part and in whatever way or form, to any person or entity other than a person employed by the Supplier, without the prior written consent of the PWGSC's Contracting Authority and for any purpose other than for the preparation of the RFP.

4. The Supplier agrees to immediately notify the PWGSC's Contracting Authority if any person other than the Supplier's current employees accesses the Confidential Information at any time.

5. The Supplier undertakes to treat protected information as Confidential Information, whether this is the case or not, and to ensure that it cannot be accessed by anyone except the Supplier's current employees with a "need to know" for the Purpose of presenting the RFP.

6. The Supplier shall at all times use the same degree of care as it uses to protect its own confidential information of like importance to prevent the unauthorized use or disclosure of Confidential Information, but in no event less than a reasonable degree of care. The Supplier shall not, nor shall it permit its employees to, remove any copyright, confidentiality, proprietary rights, or intellectual property notices attached to or included in any Confidential Information and shall reproduce all such notices on any copies of the Confidential Information.

7. The Supplier is responsible for any breach of this NDA by any of its employees and shall not permit its employees to modify, disassemble, decompile, or reverse engineer any Confidential Information, even if this relates to the Purpose.

8. All information contained in the above-mentioned documents and all other Confidential Information disclosed under this NDA shall remain the property of Canada, a third party, or any other person or entity to whom it lawfully belongs, as applicable.

9. Without restricting the generality of the foregoing, the Supplier recognizes that no licence or conveyance of any rights to the Supplier under any discoveries, inventions, patents, trade secrets, copyrights, or other form of intellectual property is granted or implied by the disclosure of Confidential Information under this NDA.

10. The Supplier must require any subcontractor with a "need to know" to execute an NDA on the same conditions as those contained in this NDA prior to disclosure of the Confidential Information.

11. At or leading up to the end of the bidding period, the Supplier must immediately send to the Contracting Authority any Confidential Information as well as all drafts, working documents and notes containing information related to the Confidential Information. The Supplier must not retain electronic or paper copies of any documents once it has submitted its bid.

12. All Confidential Information will remain the property of Canada and must be returned to the Contracting Authority within 30 days of its request.

13. This NDA will remain in force indefinitely.

14. Nothing in this NDA should be construed as preventing the disclosure or use of any Confidential Information to the extent that such information
    a) is in or enters the public domain through no fault of the Supplier or any proposed subcontractor;
    b) is or becomes known to the Supplier from a source other than Canada, excluding any source that the Supplier knows to be under an obligation to Canada to not disclose the information; or
    c) is disclosed under compulsion of a legislative requirement or by order of a tribunal having jurisdiction.

15 The Supplier agrees that a breach of this NDA may result in disqualification of a Supplier or a Qualified Supplier at any time or immediate termination of the resulting contract. The Qualified Supplier also acknowledges that a breach of this NDA may result in a review of the Qualified Supplier's security clearance and a review of its status as an eligible bidder for other requirements.

16. The Supplier acknowledges and agrees that it will be liable for any and all claims, loss, damages, costs, or expenses incurred or suffered by Canada caused by the failure of the Supplier, or by anyone to whom the Supplier discloses the Confidential Information, to comply with these conditions.

17. Canada retains the right to refuse access to these documents.

IN WITNESS WHEREOF, this Non-Disclosure Agreement has been duly signed on this ___ day of _____ 2020, by an authorized representative of

_____
Name of supplier

_____ _____
Name of authorized representative (in uppercase letters) Name of witness (in uppercase letters)

_____ _____
Signature of authorized representative Signature of witness
(I have the authority to bind the corporation.)

**ANNEX «E»**

SERVICE LEVEL AGREEMENT
FOR
SATELLITE FLIGHT OPERATIONS AND DATA MANAGEMENT SERVICES

Table of Content

**Contents**

## Table of Tables

# 1 Introduction

## 1.1 Purpose

This document defines the Service Levels of the Satellite Operations contract required by the Canadian Space Agency (CSA) for the provision of Satellite Flight Operations and Data Management Services to be performed at the John H. Chapman Space Center (JHCSC) in Longueuil, Quebec.

The Services and activities performed under the Satellite Flight Operations and Data Management Services contracts are defined within 3 different Domains:

- Flight Operations
- Data Management
- Ground System Operations

From this perspective, and in order to capture the end-to-end service provision and apply standardized processes and performance targets, unified performance indicators have been defined for all the Domains, where possible and where processes are applicable. When requirements of a Domain service demand specific performance or process indicators, they have been also reflected. For further details on the Services to be provided covered by this Service Level Agreement (SLA), please refer to the Statement of Work (SOW) [AD-01]

The Quality of Service (QoS) is described in terms of Performance Indicators (PI), and service levels that are to be considered as Key Performance Indicators (KPI) are defined (Section 3), together with the proposed Incentive Scheme (Section 4).

## 1.2 Scope

The scope of this document is to stand as a complementary requirement document to the SOW [AD-01] for the provision of Satellite Flight Operations and Data Management Services. While the SOW describes the Mandatory Work to be performed under a Firm-Fixed Price contract, the SLA describes the QoS in terms of specific KPIs where over-performance will lead to financial incentive (bonus) to the Contract.

## 1.3 Conventions and Definitions

### 1.3.1 Language Convention

As English is the common oral and written language for design, development, operation and utilization of space projects, the Contractor must use English for this Work, and for exchanges with CSA, along with System International (SI) units

### 1.3.2 Document Convention

A number of the sections in this document describe controlled requirements and specifications and therefore the following verbs are used in the specific sense indicated below:

“Must” is used to indicate a mandatory requirement,

“Should” indicates a preferred alternative but not mandatory,

“May” indicates an option,

“Will” indicates a statement of intention or fact, as does the use of present indicative active verbs.

### 1.3.3 Terminology

"Contractor ": team that will conduct the work, which could be a mixed team drawn from Canadian industry, universities or research institutes, including subcontractors;

“Data Management”: subset of all mission activities related to the mission payload data ordering, reception, processing, calibration, distribution and archiving, and the maintenance of its system and procedures;

“Domain”: is on area of Satellite Operation activities covering Flight Operations, Data Management and Ground Systems Operation and maintenance;

“Flight Operations”: subset of all mission activities related to spacecraft health, monitoring and control, spacecraft activity planning, flight dynamics and orbital maintenance, and the maintenance of its system and procedures;

“Ground System Operations”: subset of all activities related to satellite infrastructure, ground antennas Telemetry, Tracking & Control, communication systems, networking, and the maintenance of its system and procedures;

"Mission": the complete life cycle of a satellite and its products, from pre-launch preparation to de-commissioning;

"Operational Database": the collection of all data elements, resident in the operational system, required for its on-going operation, including operational procedures, data, and documentation;

"Operational System": the collection of all software, hardware, and operational database elements required to conduct those operational activities required to complete the mission;

“SCAN” Spacecraft Anomaly Notice: Contains the summary information of a Spacecraft anomaly event, including the anomaly occurrence time, the detection time, the recovery time and notification times;

“Space Asset” or “Space Segment Asset” (SSA): Satellite systems (spacecraft bus and payload components) of a mission in orbit.

### 1.3.4 Acronyms

| | |
|---|---|
| AD | Applicable Document |
| COLA | Collision Avoidance |
| CSA | Satellite Operations, Space Utilization, Canadian Space Agency, responsible for the overall management of this Contract |
| GFE | Government-Furnished Equipment |
| ID | Identifier |
| IR | Initial Release |
| KPI | Key Performance Indicator |
| NA | Not Applicable |
| NC | Non-Conformance |
| PI | Performance Indicator |
| QoS | Quality of Service |
| RCM | RADARSAT Constellation Mission |
| RD | Reference Document |
| SCAN | Spacecraft Anomaly Notice |
| SLA | Service Level Agreement |
| SOW | Statement Of Work |
| TT&C | Telemetry, Tracking and Command |
| TBC | To Be Confirmed |
| TBD | To Be Determined |

# 2 References

## 2.1 Applicable documents

The following documents of the exact issue date and revision level shown are applicable and form an integral part of this document to the extent specified herein.

| ID | Number | Revision | Title |
|---|---|---|---|
| **AD-01** | CSA-MM-SOW-0001 | IR | Statement of Work – Satellite Flight Operations and Data Management Services |

## 2.2 Reference documents

The following documents provide additional information or guidelines that either may clarify the contents or are pertinent to the history of this document.

| ID | Number | Revision | Title |
|---|---|---|---|
| **RD-01** | CSA-RC-RD-0002 | H | RCM Mission Requirement Document (MDR) |

.

## 3 General

Metrics are measures of quantitative assessment commonly used for assessing, comparing, and tracking performance. Performance Indicators (PI) are those metrics that will be collated to evaluate and report on the effectiveness and efficiency of CSA Satellite Flight Operations and Data Management Services. As per Section 3.2 of this document, Key Performance Indicators (KPI) must be well-defined and quantifiable measures, applicable to satellite operations, that are crucial to achieving Satellite Flight Operations and Data Management Services goals at the CSA.

### 3.1 Performance Indicators

Service level requirements are be tailored to match the required quality and performance of the Service. PIs are used to measure the performance levels and as input for defining and computing the KPIs. These requirements constitute the basis for PIs and KPIs and the related Service Level agreement (SLA).

PIs are classified into two groups:

- *Mandatory performance indicators provided by the CSA,* characterizing the actual performance of the Satellite Flight Operations and Data Management Services and intended to be used for KPI definition; and,
- *Performance indicators proposed by the Contractor,* only for monitoring purposes.

The PIs required by the CSA are introduced in Table 1 and Table 2 for Flight Operations and Data Management services respectively. Additional PIs may be proposed by the Contractor if relevant to effectively manage the SLA and report on the Service as described in the Statement of Work (SOW) [AD-01].

For each PI, a *Performance Target* figure should be provided, which characterise the nominal performance expected as from the System requirements and/or mission objectives.

### 3.2 Performance Indicators Requirements

In order to better formulate the PI and KPI, a set of guidelines and requirements are provided below.

[PI-REQ-01] The set of Performance Indicators (PI) must comply with the following elements:

1. The PIs must enable characterization of the Service performance (e.g. availability, timeliness, completeness…);
2. The PIs must be unambiguously measurable in time;
3. The number of PIs should be limited in number (less than 25)

In Section 3.3, the CSA has provided the initial set of PIs and selected a subset of Key Performance Indicators (less than 10) to be used in the Incentive Scheme (Section 4).

[PI-REQ-02] Each PI, including KPI, must be defined with:

1. PI ID: a unique ID to identify the service and performance indicator within the service;
2. Description: a short description of the measured indicator;
3. The detailed measurement method as required, including:
   a. The identification of any raw information used to compute the PI,

b. The mechanism and tools for the collection of the raw information used to compute the PI,
c. The detailed description of the rationale used to derive the final PI,
d. The PI unity (e.g. % of sensing time),
e. The PI validity scope (e.g. timelines….), and
f. The PI time unit (e.g. orbit, day, month,..).

4. The monitoring and reporting approach;
5. Target performance level; and
6. Monitoring and Reporting Periods: specifies the time interval in which the performance indicator is collected/measured and reported, e.g.: orbit basis, daily basis, weekly basis, monthly basis.

In addition, KPIs include as well in their definitions the Weight factor for the purpose of Incentive cost calculations (Section 4).

[PI-REQ-03] The Contractor must systematically and periodically measure metrics and compute and monitor PI values according to their Monitoring Period starting from the Initial Operations Phase [AD-01].

[PI-REQ-04] The Contractor must allow the computation of KPIs on a monthly and quarterly interval for any monthly/quarterly based sliding window, with the exclusion of externally caused outages outside of the Contractor's control, e.g. Government Furnished Equipment (GFE) maintenance.

[PI-REQ-05] The Contractor must report the status of the defined PIs and KPIs through monthly/quarterly reports, and Service reviews [AD-01] according to their Reporting Frequency.

[PI-REQ-06] The Contractor must proactively disclose any instances where the required service levels are not being achieved.

[PI-REQ-07] If any performance deficiencies are identified at any time, the Contractor must prepare a recovery plan, with justifications for deviations and actions for resolution.

### 3.3 Performance Indicator Listing

The PI are tabulated in Table 1 and Table 2 for Flight Operations and Data Management respectively where Flight Operations include also PIs pertaining to the Ground System Operations Domain. PIs are uniquely identified with a P00 identification number (ID). Whenever a PI is deemed key to the operations, it has a K00 identifier (ID) and has a weight associated to it for Incentive cost calculation (Section 4).

### 3.3.1 Service Performance Indicators for Flight Operations[1]

**Table 1 PERFORMANCE INDICATORS FOR FLIGHT OPERATIONS**

| ID | Title | Objectives | Description | Raw Metric Used | Mechanism for Metric Collection | Rational to derive PI | PI Unit | PI Validity Scope | PI Time Unit | Monitoring and Reporting Approach | Monitoring Period | Reporting Period | Target[2] per Quarter | KPI Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **K01** | System Availability - RCM | • Monitor overall Space and Ground Segment anomaly impacts on mission performance;<br>• Perform timely preventive maintenance and upgrades;<br>• Improve recovery response time and efficiency. | The percentage of time the Space and Ground Segment systems are available to perform the RCM mission requirements.<br><br>(The system is available if both the three (3) spacecraft and ground system are operational and meeting mission requirements) | Mission outage time per anomaly | Anomaly outage times are entered in SCANs and automatically populating a SCAN database. A query to the SCAN database allows the availability performance indicator to be calculated over the desired period. | Within a month, 100x The sum of all the applicable outage times / the PI time unit | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal. | Daily | Monthly | RCM ≥90% | 0.5 |
| **P02** | System Availability – Small Missions | | The percentage of time the Space and Ground Segment systems are available to perform small mission requirements. | Mission outage time per anomaly | Anomaly outage times are entered in SCAN. Review of SCAN files allows the availability performance indicator to be calculated over the desired period. | Within a month, 100x The sum of all the applicable outage times over the PI time unit | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal. | Daily | Monthly | For each Small Mission ≥90% | N/A |
| **P03** | System Anomaly Resolution Time | • Ensuring the anomalies are managed efficiently and towards final resolution<br>• Ensuring no open work related to spacecraft safety. | The average time from initial anomaly file opening to final disposition/closure | From Anomaly Database system | | | | | | To be defined by the contractor in the proposal. | Daily | Monthly | <1 mth | N/A |
| **P04** | System Anomaly Resolution Efficiency | | The percentage of spacecraft anomaly files[3] disposed and closed within 6 months from file opening. | From Anomaly Database system | | | | | | To be defined by the contractor in the proposal. | Daily | Monthly | 100% | N/A |
| **P05** | Space Segment Risk Assessment Time | • Minimize health and safety risk to space assets due to undetected anomalous signatures | The percentage of spacecraft anomaly files where the initial anomaly meeting occurred within 24 hours from the time of anomaly occurrence. | From SCAN data | | | | | | To be defined by the contractor in the proposal. | Daily | Monthly | ≥95% | N/A |

[1] Flight Operational health and Safety procedures and processes have precedence over meeting KPIs/PIs.
[2] Unless otherwise specified, the PI Target applies to all missions.
[3] A Spacecraft Anomaly File cannot be divided into multiple files without CSA consent.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | • Improve anomaly detection and diagnostic capability<br>• Improve trending algorithms and reporting | | | | | | | | | | | | |

### 3.3.2 Service Performance Indicators for Data Management

**Table 2 PERFORMANCE INDICATORS FOR DATA MANAGEMENT**

| ID | Title | Objectives | Description | Raw Metric Used | Mechanism for Metric Collection | Rationale to derive PI | PI Unit | PI Validity Scope | PI Time Unit | Monitoring and Reporting Approach | Monitoring Period | Reporting Period | Target [4] per Quarter | KPI Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **K11** | SAR Acquisition Downlink to Delivery Time – Canada Maritime AOI within Canadian mask | Meet the RCM Mission Requirement MRD34010 | The percentage of image products where all the non-ship-detection maritime SAR data collected over Canadian Maritime Areas of Interest inside Canadian station masks was processed and delivered within 30 minutes from downlink. Assumption: when requested as such by order client. | Number of image products generated from non-ship-detection maritime SAR data collected over Canadian Maritime Areas of Interest inside Canadian station masks. | Query to the database of the order handling system. | Within a month, 100 X ratio of: **Raw Metric Used**, processed and delivered within 30 minutes / **Raw Metric Used**. | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal. | Data Reception Pass | Monthly | RCM ≥95% | 0.5 |
| **K12** | SAR Acquisition to Delivery Time – Canada Maritime AOIs outside Canadian masks | Meet the RCM Mission Requirement MRD34030 | The percentage of image products where all the maritime SAR data collected over Canadian Maritime Areas of Interest outside Canadian station masks was processed and delivered within 3 hours from acquisition. Assumption: when requested as such by order client. | Number of image products generated from maritime SAR data collected over Canadian Maritime Areas of Interest outside Canadian station masks. | Query to the database of the order handling system. | Within a month, 100 X ratio of: **Raw Metric Used**, processed and delivered within 3 hours from acquisition / **Raw Metric Used**. | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal. | Data Reception Pass | Monthly | RCM ≥95% | 0.5 |
| **K13** | SAR Order Accepted to Spacecraft Tasked Time – Fast-Tasking | Meet RCM Operations Requirements | The percentage of SAR Fast-Tasking Orders successfully planned and uploaded to a spacecraft within 4.6 hours from the time the order placement is accepted by the system. | Number of SAR Fast-Tasking Orders | Query to the database of the order handling system. | Within a month, 100 X ratio of: **Raw Metric Used** successfully planned and uploaded to a spacecraft within 4.6 hours from order placement accepted by the system / **Raw Metric Used** | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal. | Daily | Monthly | RCM ≥95% | 0.5 |

[4] Unless otherwise specified, the PI Target applies to all missions.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **P14** | Data Acquisition Planning Proficiency | Meet user needs for data for all missions | The percentage of valid client-submitted orders successfully planned and executed on the satellite, excluding orders in conflict | 1 - Number of valid science data product orders submitted by the user<br>2 - Number of science data products produced by the satellite meeting client specifications | Query the database of the order handling system<br><br>Query the science data acquisition results post-downlink, filtered by those meeting client specification | Within a month,100 X **Raw Metric 2** / **Raw Metric 1** | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal | Daily | Monthly | RCM ≥95%<br>SCISAT ≥95%<br>NEOSS at ≥95%<br>M3MSat ≥95% | N/A |
| **P15** | Small Mission Data Delivery Proficiency | Availability of Data Management Subsystems for delivery of data products from small missions | The percentage of data products delivered within one hour of expected downlink | 1 - Number of science data products produced by the satellite<br>2 - Number of science data products delivered to the client within one hour of expected downlink time | Query the science data acquisition results post-downlink<br><br>Query the client databases to confirm delivery | Within a month,100 X **Raw Metric 2** / **Raw Metric 1** | % | 24/7 over the reporting period | Month | To be defined by the contractor in the proposal | Daily | Monthly | SCISAT ≥95%<br>NEOSS at 95%<br>M3MSat ≥95% | N/A |

## 4 Incentive Scheme

The Quality of Service (QoS) will be measured using the KPIs indicated in the previous sections. As such, the set of criteria for categorizing a specific QoS level to be provided by the Service Provider is defined in this SLA, and when applicable, by specific provisions within the SOW [AD-01].

Whereas the focus within provision of Service is on the Cost, Quality, Capacity and Availability of the Service being delivered, the core principles of the proposed Service Incentive Scheme are as follows:

- Service Incentives only arise in relation to services for which the Contractor has responsibility under the terms of the Contract;
- Minimum Service Level Requirements (i.e. the performance standards below which service Incentives become payable) are applied as agreed and stated in the applicable “KPIs” tables given above, weighted according to their operational criticality;
- Service Incentives are capped yearly to a maximum of 10% of the total Service Value of the mandatory work without consideration of the services under Task Authorization, aggregated for all services delivered in any given quarter;
- Service Incentive Cost calculation for every quarter will be cumulated and carried over to the end of the year for payment as per Contract’s Basis of Payment;
- Underperformance on one or more KPI will be cumulated and carried over with the cost of other KPI reducing the potential for Incentive, but the cumulated Cost will never yield in a financial penalty at the end of the year ;
- Incentives are not applied to services of less than one month’s duration (temporary assignments etc);
- In the event that a KPI does not meet its Target value, the Contractor must provide a recovery plan as part of the quarterly report. (See requirements in Section 3.2)
- The recurring non-fulfilment of the service or recovery plan generates an operational situation that is not simply managed by the application of such scheme, and will require specific management measures, and the activation of legal dispositions included in the Contract.

The proposed Service Incentive Scheme is as follows:

$$COST = \Sigma\ (WEIGHT \times (SIGN)(METRIC - TARGET)/TARGET) \times SERVICE\ VALUE/4$$

Where:

- WEIGHT factor and TARGET taken from KPI tables
- SIGN is “**+**” if the METRIC is desired to be greater than the TARGET, and “**–**“ if the METRIC is desired to be smaller than the TARGET
- METRIC measured as per KPI tables, systematically and periodically
- COST, Incentive computed quarterly
- COST Cap = +10% SERVICE VALUE of the mandatory work for the year, to be paid as per Contract’s Basis of Payment

Example:

Let us assume that we monitor 2 KPIs:

- SERVICE VALUE
- $TARGET_1$ = ≥99.5%, $SIGN_1$ = “+”, $METRIC_1$ = 100%, $WEIGHT_1$ = 10
- $TARGET_2$ = ≥10min, $SIGN_2$ = “+”, $METRIC_2$ = 8min (underperformance), $WEIGHT_2$ = 0.05

    - COST = (10x(+)(100% - 99.5%)/99.5% + 0.05x(**+**)(8min-10min)/10min) x SERVICE VALUE/4 = +1.006% x SERVICE VALUE in that Quarter.

## 5 Review Process

This SLA may be subject to changes and updates by the CSA when one or more unforeseen circumstances or events require to:

- Changes in Service requirements in the SOW [AD-01];
- Changes in working processes;
- Changes in Quality of Service requirements;
- Evolution of metrics, metric measurement tools and related processes; or
- Introduction of new services requiring a different service management approach.

SLA changes and updates will be done as part of the Operational Service Reviews [AD-01 Section 7], as required, to account for necessary operational adjustments to the PIs and KPIs. If the situation requires, an updated SLA will be amended through the normal Contract amendment process and will take precedence and full effect for the remainder of the Contract period.

## APPENDIX 1 Sample KPI Calculation Spreadsheet

### Table 3 KPI Calculation Spreadsheet Simulation

CSA-MM-AGR-0001 Appendix 1
9F044-190433 ANNEX E-1

Example

| | |
|---|---|
| **CONTRACT #** | 9F044-190433 |
| **TITLE** | Satellite Flight Operations and Data Management Services |
| **DOCUMENT** | Service Level Agreement (SLE) - Key Performance Indicator (KPI) Calculation Spreadsheet |
| **ASSESSMENT PERIOD** | 1 Jan 2021 to 31 Dec 2021 |
| **FILE UPDATED** | 9-Mar-20 |

| KPI | | | | MAX | MAX | | Q1 | | Q2 | | Q3 | | Q4 | | YEARLY TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | TITLE | WEIGHT | TARGET | VALUE | COST | INSTANCE | METRIC | COST | METRIC | COST | METRIC | COST | METRIC | COST | METRIC | COST |
| K01 | System Availability - RCM | 0.5 | 90.0% | 100% | +5.56% | RCM | 87.0% | -0.42% | 89.0% | -0.14% | 91.0% | +0.14% | 97.0% | +0.97% | 91.0% | +0.56% |
| K11 | SAR Downlink to Delivery Time - Canada Maritime within Canadian masks | 0.5 | 95.0% | 100% | +2.63% | RCM | 94.0% | -0.13% | 96.0% | +0.13% | 98.0% | +0.39% | 99.0% | +0.53% | 96.8% | +0.92% |
| K12 | SAR Acquisition to Delivery Time - Canada Maritime outside Canadian masks | 0.5 | 95.0% | 100% | +2.63% | RCM | 99.0% | +0.53% | 93.0% | -0.26% | 95.0% | +0.00% | 97.0% | +0.26% | 96.0% | +0.53% |
| K13 | SAR Orders Accepted to Spacecraft Tasked Time – Fast-Tasking | 0.5 | 95.0% | 100% | +2.63% | RCM | 98.0% | +0.39% | 99.0% | +0.53% | 94.0% | -0.13% | 94.0% | -0.13% | 96.3% | +0.66% |
| **Total Cost Capped between 0 and +10% yearly** | | | | | **+10.00%** | | | **+0.37%** | | **+0.26%** | | **+0.40%** | | **+1.63%** | | **+2.66%** |

| | |
|---|---|
| YEARLY SERVICE VALUE | $ - |
| INCENTIVE COST | $ - |

| **Signatures:** | **CSA** | | **Contrator** |
|---|---|---|---|
| Technical Authority: | | Operational Authority: | |
| | <NAME> | | <NAME> |
| | <PHONE> | | <PHONE> |
| Project Authority | | | |
| | <NAME> | | |
| | <PHONE> | | |
| Contracting Authority: | | | |
| | <NAME> | | |
| | <PHONE> | | |

**ATTACHMENT 1 TO PART 4**

**EVALUATION PROCEDURES AND BASIS OF SELECTION**

**FOR**

**SATELLITE FLIGHT OPERATIONS AND DATA MANAGEMENT SERVICES**

## Evaluation Criteria Summary

*Table 1 Evaluation Criteria Summary*

| Item | Evaluation Criteria Title | Criteria Type: Mandatory (M) Point-Rated (P) | Maximum Score [pts] | Minimum Required Score [pts] |
|---|---|---|---|---|
| **M1.** | **Mandatory Documents** | M | N/A | N/A |
| P1 | Corporate Profile and Experience in providing Satellite Flight Operations and Data Management Services | P | 11 | 5 |
| P2 | Team Experience with Satellite Operations, Ground Systems, and Data Systems | P | 12 | 6 |
| P3 | Understanding and Implementation Approach | P | 12 | 8 |
| P4 | Performance Indicators | P | 10 | 0 |
| P5 | Value-Added Proposal | P | 15 | 0 |
| | **Overall** | | **60** | **30**[1] |

[1] The minimum required overall score is 30, in addition to considering the minimum score for criteria P1 to P3, indicating that Proposal needs to pass the overall minimum score in addition to each of the individual criterion in order to be deemed responsive (i.e. compliant).

**Mandatory Criteria**

Each of the following Mandatory Criteria must be presented in the Proposal. Proposals not meeting the mandatory requirements will be deemed non-responsive. Only those proposals which are responsive (compliant) with all of the mandatory criteria will be further considered for evaluation in the next step: Point-Rated Criteria.

In all cases, explicit evidence[2] must be provided and the level of detail provided must be sufficient for an evaluator to confirm compliance with the requirements.

For the following criteria, when a detailed substantiation is required, the Bidder must provide a detailed statement of how it complies with the requirements. Cross-references to appropriate sections of the proposal should be provided when applicable and the essence of the referenced information should be summarized in the substantiation.

Where an approach is deemed credible, it means that an evaluator, using his/her expertise, experience and the information solely provided in the Proposal, is of the opinion that the Bidder has clearly demonstrated, through clear examples and verifiable assertions that the approach can meet the objectives.

**M1. Mandatory Documents**

The Proposal must include all the documents required in Initial Release (IR) version at Proposal submission as per SOW Table 7-2. Some documents are only required in Draft (D) version at Proposal submission and are therefore not mandatory but highly recommended for the Point-Rated Criteria. Any one document for IR at Proposal submission missing from the list or found without substantive content will result in the Proposal being deemed unresponsive.

[2] An explicit evidence example may be an attached Resume with detailed number of months of experience addressing the requested criteria.

**Point-Rated Criteria**

For each of the following Point-Rated Criteria, Proposals must obtain the minimum points required for each rated criterion to be assessed as responsive under the point rated technical criteria section. Proposals not meeting the minimum required points will be deemed non-responsive. Proposals which are not responsive (i.e. not compliant) with all of the mandatory criteria will not have their point-rated criteria evaluated.

In all cases, the level of detail provided must be sufficient to confirm compliance with the requirements. The Bidder Self-Evaluation requested below will be used to guide the reviewer but points will be awarded only where sufficient evidence is found.

Where an approach is deemed credible, it means that an evaluator, using his/her expertise, experience and the information solely provided in the Proposal, is of the opinion that the Bidder has clearly demonstrated, through clear examples and verifiable assertions that the approach can meet the objectives.

The evaluator will only provide points for criteria where there is sufficient evidence as described in P1 and P2 tables below.

**Bidder Experience**

Except where expressly provided otherwise, the experience described in the Proposal must be the experience of one or more of the following:

1. The Bidder itself;
2. The Bidder's affiliates;
3. The Bidder's subcontractors.

The experience of the Bidder's suppliers will not be considered.

The Proposal should include a self-evaluation which provides explicit evidence of compliance. The self-evaluation must be documented in the following format. For mandatory criteria, the Bidder must evaluate themselves as either “compliant” (C) or “non-compliant” (NC) with explicit evidence to justify the evaluation. For point-rated criteria, the Bidder must evaluate themselves by provided their score with explicit evidence to justify the evaluation.

| Item | Evaluation Criteria Title | Evaluation[3] | Evidence |
|---|---|---|---|
| **M1. Mandatory Documents** | | | |
| P1 | Corporate Profile and Experience in providing Satellite Flight Operations and Data Management Services | | |
| P2 | Team Experience with Satellite Operations, Ground Systems, and Data Systems | | |
| P3 | Understanding and Implementation Approach | | |
| P4 | Performance Indicators | | |
| P5 | Value-Added Proposal | | |

[3] For M1, either Compliant (C) or Non-Compliant (NC); for P1 to P5, self-evaluated score

**P1. Corporate Profile and Experience in providing Satellite Flight Operations and Data Management Services**

The Contract will deliver Satellite Flight Operations and Data Management Services. This criterion assess the Bidder's corporate profile and experience in providing the Services.

To demonstrate conformance with the criteria, the Bidder must provide a substantive description of experience for each of the three (3) required Domains of Service, in which the Bidder had a role within the past fifteen (15) years and a description of the business model to implement the service. The experience for a Domain must include all of the following sub-domain activities, as defined in the SOW:

1. Satellite Flight Operations
    a. Spacecraft Activity Planning and Contact Operations
    b. Satellite Health Maintenance, Monitoring and Control
    c. Orbit Maintenance, Monitoring and Control
    d. Flight System Configuration Management
2. Satellite Data Management
    a. Payload Data Order Handling and Acquisition Planning
    b. Payload Data Reception and Processing
    c. Payload Data Product Quality Control
    d. Data Reporting Support
    e. Data System Configuration Management
3. Satellite Ground Systems Operations and Maintenance
    a. Antenna Reservation System Operation
    b. Telemetry, Tracking and Commanding System Operation
    c. Network and Communication System Operation
    d. Operational System Configuration Management
    e. Life-Cycle Support

In addition, the Bidder must provide a substantive description of experience for Service Integration related to Satellite Flight Operations and Data Management.

For P1 criterion, all the Elements will be evaluated together and assigned “Poor”, “Inadequate”, “Minimal”, “Adequate” or “Excellent” and receive the corresponding point value as per table below. The minimum passing score is Minimal.

| ELEMENTS | Poor<br>0 point | Inadequate<br>2 points | Minimal<br>5 points | Adequate<br>8 points | Excellent<br>11 points |
|---|---|---|---|---|---|
| **Flight Operations Services**<br>**Satellite Data Management Services**<br>**Satellite Ground Systems Operations and Maintenance**<br>**Service Integration** | The Proposal does not identify relevant experience in two or more of the three (3) specified Elements.<br>OR<br>The business models have been presented with insufficient details or are not relevant to this contract. | The Proposal identifies some experience in at least two (2) of the specified Elements.<br>The proposed example shows a limited role that the Bidder had in the development of the service; the business model is poorly described. | The Proposal identifies relevant experience in (2) of the specified Elements.<br>The proposed example shows an important but not lead role that the Bidder had in the development of the service; the business model is well described and could be relevant for this contract. | The Proposal clearly identifies relevant experience in at least three (3) specified Elements.<br>For each Element, at least one (1) example demonstrates that the Bidder led the development of the service and reached delivery of service using a business model that could be relevant to this contract. | The proposal clearly identifies relevant experience in ALL four (4) specified Elements.<br>For each Element, at least two (2) examples demonstrate that the Bidder led the development of the service and reached delivery of service using a business model that could be relevant to this contract. |

**P2. Team Experience with Satellite Operations, Ground Systems, and Data Systems**

This criterion assesses the capability (education, knowledge, experience, expertise and complementarities) of the key resources, including subcontractors, identified to carry out the Mandatory Work as described in the SOW. The Bidder should demonstrate that the skills of the team include those necessary to lead teams located in different locations and through different Contract Phases. The Proposal must be in accordance with the following requirements:

1. The Bidder must identify the management team (Service Manager, delegates, supervisors,…) and outline their relevant qualifications and experience. The resume of the management team must be provided in an Appendix of the Technical Proposal, and must clearly and explicitly demonstrate relevant years of experience, including project descriptions, roles, responsibilities, and dates.
2. The Bidder must identify the “Key members” of the projects’ technical and management teams and state their roles, specific qualifications and experience for the Work involved. Resumes of Key members must be provided in an Appendix of the Technical Proposal, and must clearly and explicitly demonstrate relevant years of experience, including project descriptions, roles, responsibilities, and dates. The Key members must have the required experience in each of the sub-domains, listed below:
    1. Satellite Flight Operations;
        a. Spacecraft Activity Planning and Contact Operations
        b. Satellite Health Maintenance, Monitoring and Control
        c. Orbit Maintenance, Monitoring and Control
        d. Flight System Configuration Management
    2. Satellite Data Management, Data Processing and Calibration; and
        a. Payload Data Order Handling and Acquisition Planning
        b. Payload Data Reception and Processing
        c. Payload Data Product Quality Control
        d. Data Reporting Support
        e. Data System Configuration Management
    3. Satellite Ground Systems Operations and Maintenance.
        a. Antenna Reservation System Operation
        b. Telemetry, Tracking and Commanding System Operation
        c. Network and Communication System Operation
        d. Operational System Configuration Management
        e. Life-Cycle Support

For P2 criterion, Proposals will be evaluated based on the following evaluation table. Each Element will be evaluated independently and assigned “Poor”, “Minimal”, “Adequate” or “Excellent” and receive the corresponding point value. The minimum passing score for each element is “Minimal”. The total score for criteria P2 is the cumulative points for all the elements and the minimum passing score for the whole criteria P2 is presented in Table 1.

| ELEMENTS | Poor<br>0 point | Minimal<br>1 points per element | Adequate<br>2 points per element | Excellent<br>3 points per element |
|---|---|---|---|---|
| **1. Management** | The requirement is not addressed or fully substantiated, or otherwise does not meet the level defined for “Minimal” | At least one (1) member of the management team has a minimum of five (5) years of management experience in aerospace within last ten (10) years. | At least two (2) members of the management team have a minimum of seven (7) years of management experience in aerospace within last ten (10) years specifically in Satellite Operations. | At least two (2) members of the management team have a minimum of ten (10) years of management experience in aerospace within last fifteen (15) years specifically in Satellite Operations. |
| **2. Key members: Satellite Flight Operations** | The requirement is not addressed or fully substantiated, or otherwise does not meet the level defined for “Minimal” | For all four (4) sub-domain activities listed, there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of five (5) years working experience on that sub-domain activity. | For all four (4) sub-domain activities listed, there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of seven (7) years working experience on that sub-domain activity. | For all four (4) sub-domain activities listed, there are at least two (2) identified Key members with leadership responsibilities, who each have a minimum of ten (10) years working experience on that sub-domain activity. |
| **3. Key members: Satellite Data Management, Processing and Calibration** | The requirement is not addressed or fully substantiated, or otherwise does not meet the level defined for “Minimal” | For all five (5) sub-domain activities listed, there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of five (5) years working experience on that sub-domain activity. | For all five (5) sub-domain activities listed, there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of seven (7) years working experience on that sub-domain activity. | For all five (5) sub-domain activities listed, there are at least two (2) identified Key members with leadership responsibilities, who each have a minimum of ten (10) years working experience on that sub-domain activity. |
| **4. Key members: Satellite** | The requirement is not addressed or fully | For all five (5) sub-domain activities listed, | For all five (5) sub-domain activities listed, | For all five (5) sub-domain activities listed, |

| | | | | |
|---|---|---|---|---|
| **Ground Systems Operations and Maintenance** | substantiated, or otherwise does not meet the level defined for “Minimal” | there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of five (5) years working experience on that sub-domain activity. | there is at least one (1) identified Key member with leadership responsibilities, who has a minimum of seven (7) years working experience on that sub-domain activity. | there are at least two (2) identified Key members with leadership responsibilities, who each have a minimum of ten (10) years working experience on that sub-domain activity. |

**P3. Understanding and Implementation Approach**

The purpose of this criterion is to assess the Bidder's understanding of the Work as well as the implementation approach being proposed. The primary objective of this requirement is to ensure that the implementation approach covers all aspects of the work described in the SOW and that it is performed in the most effective manner.

The Bidder must provide the following Components:

1. A credible and implementable[4] Service Management and Implementation Plan (SMIP) as per SOW (CDRL-01);
2. An efficient organisation chart with roles and responsibilities, and level of effort; and
3. A credible Risk Management Plan and Risk Register as per SOW (CDRL-03 and CDRL-04)

The Components should be based on recognized management tools most applicable to the required Services, such as a scope planning (Work Breakdown Structure (WBS) and Work Package Description (WPD)) and schedule development charts (e.g. Gantt chart). Equivalent contractor-developed, project-tailored tools/charts are also acceptable.

For P3 criterion, each Element will be evaluated independently and assigned "Poor", "Minimal", "Adequate" or "Excellent" and receive the corresponding point value. The total score for criteria P3 is the cumulative points for all the Elements and the minimum passing score for the whole criterion P3 is presented in Table 1.

[4] implementable means that an evaluator, using his/her expertise, experience and the information solely provided in the Proposal, is of the opinion that the Bidder has clearly demonstrated that the work can be successfully conducted by following the plan.

| ELEMENTS | Poor<br>0 points per element | Minimal<br>2 points per element | Adequate<br>4 points per element | Excellent<br>6 points per element |
|---|---|---|---|---|
| **SMIP – Management Plan Components + Organization + Risk Plan**<br><br>**(Organizing the Work)** | Management components are not provided or are provided with insufficient detail. | Management components are provided with limited details.<br><br>The components are barely credible or implementable, generating poor confidence in the ability to manage the Work. | Management components are provided, but some of these are not sufficiently detailed.<br><br>Most components are credible and implementable, generating reasonable confidence in the ability to manage the Work. | Management components are provided with extensive details.<br><br>Each component is both credible and implementable, generating strong confidence in the ability to manage the Work. |
| **SMIP – Implementation Plan Components**<br><br>**(Understanding the Work)** | Implementation components are not provided or are provided with insufficient detail. | Implementation components are provided with limited details.<br><br>The components are barely credible or implementable, demonstrating a poor understanding of the work. | Implementation components are provided, but some aspects are not sufficiently detailed.<br><br>Most implementation components are credible and implementable, demonstrating a reasonable understanding of the Work. | Implementation components are provided with extensive details.<br><br>These components are both credible and implementable, demonstrating an excellent understanding of the Work. |

**P4. Performance Indicators**

The purpose of this criterion is to assess the Bidder's understanding of the mission objectives, the operational priorities and the Service Level Agreement (SLA). In order to obtain technical merit within this section, the Bidder must populate the Monitoring and Reporting Approach for the provided Mandatory Performance Indicators (PI) defined in the SLA.

In addition, the Bidder should propose new meaningful PI formulated as per the requirements in the SLA. PIs that are too similar to the ones provided in the SLA will be disregarded.

For P4 criterion, each Element (PI) will be evaluated independently and assigned a corresponding point value. The total score for criteria P4 is the cumulative points for all the elements.

| ELEMENTS | Poor<br>0-1 point | Minimal<br>1.5-2points | Adequate<br>2.5-3.5 points | Excellent<br>4-5 points |
|---|---|---|---|---|
| **Mandatory Performance Indicator Metrics** | Half (0.5) a point for each mandatory PI and KPI Monitoring and Reporting Approach that is well-formulated and easy to assess/monitor.<br>**Maximum: 5 points** | | | |
| | **Poor**<br>**0 point** | **Minimal**<br>**1 point** | **Adequate**<br>**2-3 points** | **Excellent**<br>**4-5 points** |
| **New Performance Indicators** | One (1) point for each new proposed PI that is unique, well-formulated, operationally relevant and easy to assess/monitor.<br>**Maximum: 5 points** | | | |

**P5. Value-Added Proposal**

The purpose of this criterion is to assess the Proposal's alignment with key government objectives for added benefits to Canadians. In order to obtain technical merit within this section, the Proposal should propose:

1. Partnership with Canadian Small & Medium Enterprise (SME) with roles in the following sub-domains activities:
    a. Satellite Flight Operations
        i. Spacecraft Activity Planning and Contact Operations
        ii. Satellite Health Maintenance, Monitoring and Control
        iii. Orbit Maintenance, Monitoring and Control
        iv. Flight System Configuration Management
    b. Satellite Data Management
        i. Payload Data Order Handling and Acquisition Planning
        ii. Payload Data Reception and Processing
        iii. Payload Data Product Quality Control
        iv. Data Reporting Support
        v. Data System Configuration Management
    c. Satellite Ground Systems Operations and Maintenance
        i. Antenna Reservation System Operation
        ii. Telemetry, Tracking and Commanding System Operation
        iii. Network and Communication System Operation
        iv. Operational System Configuration Management
        v. Life-Cycle Support
2. Implementation of specific innovative changes[5] to automate operational systems and processes in order to reduce operational cost and/or complexity, where:
    a. any required additional level of effort for this implementation must be costed as Additional Work according to the SOW, covered within the Task Authorization portion of the Contract, and provided in the Financial Proposal (this cost is not affecting Proposal's pricing score), and
    b. any required material to be provided by CSA will be subject to CSA internal authorizations and processes. (If the required material cannot be provided by CSA, then no points will be awarded for this innovation.)
3. Leveraging the Government infrastructure to increase the benefits to Canada, at no additional cost to CSA, while
    a. maintaining fulfillment of the Mandatory Work as per SOW,
    b. maintaining the required service level as per Service Level Agreement (SLA), and
    c. complying with the Security constraints of the Contract and not imposing an additional security risk to CSA Missions, subject to CSA security approval.

[5] Innovative change means any efficiency, effectiveness and productivity improvement to the operational system baseline.

4. Involvement of women and Indigenous people in the operational team, namely:

   a. have a minimum of 20% women among its executives, directors or managers, and

   b. have at least one resource of Aboriginal origin from their resources allocated to the work of this contract.

For P5 criterion, each Element will be evaluated independently and assigned “Poor”, “Minimal”, “Adequate” or “Excellent” and receive the corresponding point value. The total score for criterion P5 is the cumulative points for all the Elements.

| Key Objective | Poor<br>0 point | Minimal<br>2 points | Adequate<br>4 points | Excellent<br>5 points |
|---|---|---|---|---|
| **Partnership with Canadian SME** | The Bidder does not provide a leading role[6] to Canadian SME. | At least one (1) Canadian SME has a leading role in one (1) or more sub-domain activities. | At least two (2) Canadian SMEs have a leading role in one (1) or more sub-domain activities each. | At least two (2) Canadian SMEs have a leading role in two (2) or more sub-domain activities each. |
| | **Poor**<br>**0 point per objective** | **Minimal**<br>**2 points per objective** | **Adequate**<br>**3 points per objective** | **Excellent**<br>**4 points per objective** |
| **Implementation of specific innovative changes**<br>**(The changes must be described with enough details and deemed beneficial and implementable within the timeframe of the Contract)** | The Bidder does not provide innovative changes with enough details, benefits or cannot be implemented within the timeframe of the Contract or has unrealistic expectations for CSA resources. | The Bidder proposes to implement one (1) specific innovative change to automate one system or process, with little to no operational cost savings. | The Bidder proposes to implement one (1) specific innovative change to automate one system or process, with operational cost savings that are greater than the implementation cost. | The Bidder proposes to implement two (2) or more specific innovative changes to automate several systems or process, with operational cost savings that are greater than the implementation cost. |
| **Leveraging CSA infrastructure for to increase benefits to Canada** | The Bidder does not provide a leveraging proposition or it is detrimental to CSA. | The Bidder's proposition is beneficial to the Bidder. | The Bidder's proposition is mutually beneficial (between CSA and the Bidder). | The Bidder's proposition is mutually beneficial, and clearly identifies additional benefits to Canadians. |
| | **Poor**<br>**0 point per objective** | | **Excellent**<br>**1 point per objective** | |
| **Involvement of women** | The Bidder does not have a minimum of 20% women among | | The Bidder have a minimum of 20% women among its executives, directors or managers. | |

[6] Leading role means that the SME has the expertise and is responsible to coordinate, plan and perform the work for that sub-domain.

| | | |
|---|---|---|
| | its executives, directors or managers. | |
| **Involvement of Indigenous people** | The Bidder does not have at least one resource of Aboriginal origin from their resources allocated to the project. | The Bidder have at least one resource of Aboriginal origin from their resources allocated to the project. |