



**RETURN BIDS TO:**

**RETOURNER LES SOUMISSIONS À:**

Travaux publics et Services gouvernementaux  
Canada

Voir dans le document/

See herein

NA

Québec

NA

**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**

**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

<b>Title - Sujet</b> Mod-Sims-SciAnalyses for A-CCP	
<b>Solicitation No. - N° de l'invitation</b> 9F045-190717/A	<b>Date</b> 2020-06-16
<b>Client Reference No. - N° de référence du client</b> 9F045-190717	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$MTB-130-15760	
<b>File No. - N° de dossier</b> MTB-9-42332 (130)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2020-07-16</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Heure Avancée de l'Est HAE
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Caty, Mélanie	<b>Buyer Id - Id de l'acheteur</b> mtb130
<b>Telephone No. - N° de téléphone</b> (438) 340-1557 ( )	<b>FAX No. - N° de FAX</b> (514) 496-3822
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> AGENCE SPATIALE CANADIENNE 6767 ROUTE DE L'AEROPORT Sun-Earth systems Sciences ST HUBERT Québec J3Y8Y9 Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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

---

## TABLE OF CONTENTS

<b>PART 1 - GENERAL INFORMATION .....</b>	<b>3</b>
1.1 INTRODUCTION.....	3
1.2 SUMMARY .....	3
1.3 DEBRIEFINGS .....	4
<b>PART 2 - BIDDER INSTRUCTIONS .....</b>	<b>4</b>
2.1 STANDARD INSTRUCTIONS, CLAUSES AND CONDITIONS.....	4
2.2 SUBMISSION OF BIDS.....	5
2.3 FORMER PUBLIC SERVANT.....	5
2.4 ENQUIRIES - BID SOLICITATION.....	7
2.5 APPLICABLE LAWS.....	7
2.6 IMPROVEMENT OF REQUIREMENT DURING SOLICITATION PERIOD .....	7
2.7 MAXIMUM FUNDING.....	7
<b>PART 3 - BID PREPARATION INSTRUCTIONS.....</b>	<b>7</b>
3.1 BID PREPARATION INSTRUCTIONS .....	7
<b>PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION .....</b>	<b>9</b>
4.1 EVALUATION PROCEDURES.....	9
4.2 BASIS OF SELECTION.....	10
<b>PART 5 - CERTIFICATIONS AND ADDITIONAL INFORMATION .....</b>	<b>11</b>
5.1 CERTIFICATIONS REQUIRED WITH THE BID .....	11
5.2 CERTIFICATIONS PRECEDENT TO CONTRACT AWARD AND ADDITIONAL INFORMATION .....	11
<b>PART 6 - FINANCIAL REQUIREMENTS .....</b>	<b>12</b>
6.1 FINANCIAL CAPABILITY .....	12
<b>PART 7 - RESULTING CONTRACT CLAUSES .....</b>	<b>12</b>
7.1 STATEMENT OF WORK.....	12
7.2 STANDARD CLAUSES AND CONDITIONS.....	12
7.3 SECURITY REQUIREMENTS .....	13
7.4 TERM OF CONTRACT .....	13
7.5 AUTHORITIES .....	13
7.6 PROACTIVE DISCLOSURE OF CONTRACTS WITH FORMER PUBLIC SERVANTS .....	14
7.7 PAYMENT .....	14
7.8 INVOICING INSTRUCTIONS .....	15
7.9 CERTIFICATIONS AND ADDITIONAL INFORMATION.....	16
7.10 APPLICABLE LAWS.....	16
7.11 PRIORITY OF DOCUMENTS .....	16
7.12 FOREIGN NATIONALS (CANADIAN CONTRACTOR) .....	16
7.13 INSURANCE .....	16
7.14 DIRECTIVE ON COMMUNICATIONS WITH THE MEDIA .....	16
<b>ANNEX A .....</b>	<b>18</b>
STATEMENT OF WORK .....	18
<b>ANNEX B .....</b>	<b>19</b>
BASIS OF PAYMENT .....	19

Solicitation No. - N° de l'invitation  
9F045-190717/A  
Client Ref. No. - N° de réf. du client  
9F045-19-0717

Amd. No. - N° de la modif.  
File No. - N° du dossier  
MTB-9-42232

Buyer ID - Id de l'acheteur  
mtb 130  
CCC No./N° CCC - FMS No./N° VME

---

<b>ANNEX C .....</b>	<b>20</b>
MANDATORY TECHNICAL CRITERIA, POINT RATED TECHNICAL CRITERIA AND SELF-EVALUATION .....	20
<b>ANNEX D .....</b>	<b>31</b>
ELECTRONIC PAYMENT INSTRUMENTS .....	31
<b>ANNEX E .....</b>	<b>32</b>
CERTIFICATIONS .....	32

---

## **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:**

Annex A	Statement of Work
Annex B	Basis of Payment
Annex C	Mandatory technical criteria, point rated technical criteria and self-evaluation
Annex D	Electronic Payment Instruments
Annex E	Certifications

### **1.2 Summary**

#### **Project Title**

Modelling, Simulations and Scientific Analyses for the Aerosols – Cloud, Convection, Precipitation (A-CCP) study

#### **Description**

In late 2018 NASA began a three year multi-center study of two of the priority designated observables—Aerosols and Cloud-Convection-Precipitation (A-CCP)—to leverage the advantages of a single synergistic observing system. NASA invited the Canadian Space Agency to participate in a workshop concerning the A-CCP pre-formulation study. The CSA extended this invitation to scientists from Environment and Climate Change Canada (ECCC) and to scientists with relevant expertise from Canadian universities. The Canadian delegation to this workshop made a presentation about potential Canadian contributions to the mission.

This was followed up by submission of technical information about potential Canadian instrument contributions to the A-CCP mission. These are: Aerosol Limb Imager (ALI), Spatial Heterodyne Observations of Water (SHOW) and Thin Ice Clouds Far InfraRed Experiment (TICFIRE).

Initial NASA assessments have indicated that the Canadian instruments ALI, SHOW and TICFIRE will enhance baseline observations and may be accommodated on A-CCP spacecraft.

inclusion of the Canadian instruments on NASA spacecraft is being assessed by NASA from technical, scientific, and cost perspectives. Simulations of measurements to be made by the Canadian instruments are required for each A-CCP satellite architecture in order to assess the science value of the Canadian instruments with respect to the A-CCP Science and Applications Traceability Matrix and to the other instruments from NASA and international partners.

#### **Period of Contract**

From the contract award up to 24 months.

#### **Intellectual property**

Contractor to own Intellectual property

#### **Maximum funding**

The maximum funding available for the Contract resulting from the bid solicitation is **\$920 000** (Applicable Taxes extra). Bids valued in excess of this amount will be considered non-responsive. This disclosure does not commit Canada to pay the maximum funding available.

#### **Security requirements**

There is no security requirements associated with this requirement.

#### **Trade agreements**

This requirement is not subject to the trade agreements.

#### **Canadian Content Policy**

The requirement is limited to Canadian services.

#### **Epost connect**

#### **IMPORTANT NOTICE TO SUPPLIERS RE. BID SUBMISSION REQUIREMENTS**

Due to the impacts from the COVID-19 pandemic, temporary measures are being taken on-site at the Québec Region Bid Receiving Unit to encourage social distancing. The health and safety of staff and suppliers remains our top priority.

Suppliers are required to submit bids electronically using the Canada Post epost Connect application for the subject bid solicitation. This service allows suppliers to submit bids, offers and arrangements electronically to PWGSC Bid Receiving Units. This online service enables the electronic transfer of large files up to Protected B level.

Faxed and hard copy (submitted in person or via mail/courier) bids will not be accepted for the subject bid solicitation.

Given current circumstances and network limitations, some active procurements may be delayed. To stay up to date on the status of specific procurements, please consult Buysandsell.gc.ca.

#### **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.

### **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-) (<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

- (a) Bids must be submitted only to the Public Works and Government Services Canada (PWGSC) Bid Receiving Unit **via e-post Connect** by the date and time indicated on page one of the bid solicitation.

**Note:** For bidders needing to register with epost Connect the email address is:

[TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca](mailto:TPSGC.RQReceptionSoumissions-QRSupplyTendersReception.PWGSC@tpsgc-pwgsc.gc.ca)  
**Interested Bidders must register a few days prior to solicitation closing date.**

**Note:** Bids will not be accepted if emailed directly to this email address. This email address is to be used to open an epost Connect conversation, as detailed in Standard Instructions [2003](#), or to send bids through an epost Connect message if the bidder is using its own licensing agreement for epost Connect.

- (b) Due to the nature of the bid solicitation, bids transmitted by facsimile or electronic mail 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 ten (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 ten (10) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

## 2.7 Maximum funding

The maximum funding available for the Contract resulting from the bid solicitation is **\$920 000** (Applicable Taxes extra). Bids valued in excess of this amount **will be considered non-responsive**. This disclosure does not commit Canada to pay the maximum funding available.

# PART 3 - BID PREPARATION INSTRUCTIONS

## 3.1 Bid Preparation Instructions

### Epost Connect Bid Submission

- (i) Canada requires that the Bidder submit their electronic 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.
- (ii) The bid must be gathered per section and separated as follows:
  - (A) Section I: Technical Bid



- 
- (B) Section II: Financial and Managerial Bid
  - (C) Section III: Certifications
  - (iii) Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.
  - (iv) For further information please refer to article 08 - Transmission by facsimile or by epost Connect at <https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/1/2003/23#transmission-by-facsimile>.

## Section I: Technical and Managerial Bid

In their technical and managerial 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 and managerial 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 Part 4: *Evaluation Procedures and Basis of Selection*, contains additional instructions that Bidders should consider when preparing their technical and managerial bid.

The Annex C: *Mandatory technical criteria, Point rated technical criteria and Self-Evaluation* contains additional instructions that Bidders have to follow while preparing their technical and managerial bid.

## Section II: Financial Bid

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

- (a) A Total Cost to a limitation of Expenditure, which must **not exceed the maximum funding available** as indicated in Part 2- section 2.7 Maximum funding. The total amount of applicable taxes should be shown separately, if applicable; The information should be provided in accordance with the Basis of Payment at ANNEX B;
- (b) The prices should be in Canadian funds, Applicable Taxes excluded and Canadian customs duties and excise taxes included.

### 3.1.2 Electronic Payment of Invoices – Bid

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Annex D Electronic Payment Instruments, to identify which ones are accepted.

If Annex D 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 (2013-11-060, Exchange Rate Fluctuation

### 3.1.4 Price Breakdown

Bidders are requested to detail the following elements for expenses in the performance of each task, milestone or phase of the Work, as applicable:

- (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) Equipment: Specify each item required to complete the Work and provide the pricing basis of each one, Canadian customs duty and excise taxes included, as applicable.
- (c) Materials and Supplies: Identify each category of materials and supplies required to complete the Work and provide the pricing basis.
- (d) Travel and Living Expenses: Indicate the number of trips and the number of days for each trip (*Annex A – Statement of work, 4.2.3 Travel in TABLE 8 ESTIMATED TRAVEL*), 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 allowances 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, [http://www.tbssct.gc.ca/pubs\\_pol/hrpubs/tbm\\_113/statb-eng.asp](http://www.tbssct.gc.ca/pubs_pol/hrpubs/tbm_113/statb-eng.asp), also apply.
- (e) Subcontracts: Identify any proposed subcontractor and provide for each one the same price breakdown information as contained in this article.
- (f) Other Direct Charges: Identify any other direct charges anticipated, such as long distance communications and rentals, and provide the pricing basis.
- (g) Applicable Taxes: Identify any Applicable Taxes separately.

### Section III: Certifications

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

## 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, management and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

#### 4.1.1 Technical and Management Evaluation

##### 4.1.1.1 Mandatory Technical Criteria

The mandatory evaluation criteria are described at Annex C: *Mandatory technical criteria, Point rated technical criteria and Self-Evaluation* Bids which fail to meet the mandatory evaluation criteria will be declared non-responsive.

#### **4.1.1.2 Point Rated Technical and Management Criteria**

Point Rated Technical Evaluation Criteria are described at Annex C: *Mandatory technical criteria, Point rated technical criteria and Self-Evaluation* not addressed will be given a score of zero.

#### **4.1.2 Financial Evaluation**

##### **4.1.2.1 Financial Criteria**

The Bidder must submit a firm, all-inclusive hour rate for the Work, which must not exceed the maximum funding available for the contract resulting from the bid solicitation (Applicable Taxes extra, as appropriate). This disclosure does not commit Canada to pay the maximum funding available.

#### **4.2 Basis of Selection**

##### **4.2.1 Basis of selection – Highest Rated Within Budget**

1. To be declared responsive, a bid must:
  - a. comply with all the requirements of the bid solicitation;
  - b. meet all mandatory technical evaluation criteria; and
  - c. obtain the required minimum points for the technical evaluation criteria in annex C which by criteria.
    1. Science Criteria: 30 points
      - 1.1 Modelling Earth's Atmosphere (11 points)
      - 1.2 Remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation (7 points)
      - 1.3 Methodology (11 points)
    2. Engineering Criteria: 30 points
      - 2.1 Instrument Modelling (14 points)
      - 2.2 Data Processing (retrieval of geophysical parameters) (14 points)
    3. Management Criteria: 15 points
      - 3.1 Project Management Experience and Approach (7 points)
      - 3.2 Scientific Research Collaborations (7 points)
  - d. obtain the required minimum rating of 75 points overall (out of 100 points) for all categories of the point-rated evaluation criteria (i.e. *Merit, Feasibility and Management criteria*).
2. Bids not meeting (a) or (b) or (c) or (d) will be declared non responsive. The responsive bid with the highest number of points will be recommended for award of a contract, provided that the total evaluated price does not exceed the budget available for this requirement.

---

## 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](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) 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) (<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](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#) 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.

#### 5.2.3 Additional Certifications Precedent to Contract Award

##### 5.2.3.1 Canadian Content Certification

---

This procurement is limited to Canadian services.

The Bidder certifies that:

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

**5.2.3.1.1** SACC Manual clause [A3050T](#) (2018-12-06) Canadian Content Definition

### **5.2.3.2 Status and Availability of Resources**

SACC Manual clause [A3005T](#) (2010-08-16), Status and Availability of Resources

### **5.2.3.3 Language Capability**

The Bidder certifies that :

( ) All proposed consultants must be able to communicate (spoken and written) in English.

### **5.2.3.4 Annex E - Certifications**

The information that figures at Annex E - Certifications, must be duly completed at the closing date and hour of the invitation or before the issuance of the Standing offer.

Note 1:

To be considered, if these documents have not been provided at bid closing, PWGSC will notify the bidder, offeror or supplier that they are required to provide them within **two (2) business days** following notification by PWGSC.

(Note: this time requirement reflects PWGSC's expectation that these documents ought to be readily available to a bidder, offeror or supplier.)

## **PART 6 - FINANCIAL REQUIREMENTS**

### **6.1 Financial Capability**

SACC Manual clause [A9033T](#) (2012-07-16) Financial Capability

## **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 technical and management portions of the Contractor's bid entitled \_\_\_\_\_, dated \_\_\_\_\_. (will be inserted at contract award)

### **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) (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

2040 (2020-05-28), General Conditions - Research & Development, apply to and form part of the Contract.

### 7.3 Security Requirements

7.3.1 There is no security requirement applicable to the Contract.

### 7.4 Term of Contract

#### 7.4.1 Period of the Contract

The period of the Contract is from date of Contract to 24 months inclusive.

### 7.5 Authorities

#### 7.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Mélanie Caty  
Supply Specialist  
Public Works and Government Services Canada  
Space Programs Directorate  
Space Programs and Procurement Directorate (SPPD)

Telephone: 438-340-1557  
E-mail address: melanie.caty@tpsgc-pwgsc.gc.ca

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

#### 7.5.2 Project Authority

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

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the administrative, programmatic and technical content of the Work under the Contract. These matters may be discussed with the Project Authority; however, the Project 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.

#### 7.5.3 Technical Authority

The Technical Authority for the Contract is: *(will be inserted at contract award)*

#### 7.5.4 Contractor's Representative

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

Solicitation No. - N° de l'invitation  
9F045-190717/A  
Client Ref. No. - N° de réf. du client  
9F045-19-0717

Amd. No. - N° de la modif.  
File No. - N° du dossier  
MTB-9-42232

Buyer ID - Id de l'acheteur  
mtb 130  
CCC No./N° CCC - FMS No./N° VME

Telephone: \_\_\_\_-\_\_\_\_-\_\_\_\_  
Facsimile: \_\_\_\_-\_\_\_\_-\_\_\_\_  
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 - Cost reimbursable - Limitation of expenditure

The Contractor will be paid for its costs reasonably and properly incurred in the performance of the Work, if applicable and profit, in accordance with the Basis of payment in annex B, to a limitation of expenditure of \$ \_\_\_\_\_ (**will be inserted at contract award**). Customs duties are included and Applicable Taxes are extra.

### 7.7.2 Limitation of Expenditure

1. Canada's total liability to the Contractor under the Contract must not exceed \$ \_\_\_\_\_ (**will be inserted at contract award**). Customs duties are included and Applicable Taxes are extra.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:
  - a. when it is 75% committed, or
  - b. four months before the contract expiry date, or
  - c. as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work,

whichever comes first.

3. 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 Progress Payments

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% 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% 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 all work required under the Contract 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.

#### 7.7.4 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);

#### 7.7.5 Time Verification

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

#### 7.8 Invoicing Instructions

1. The Contractor must submit a claim for progress payment using form PWGSC-TPSGC 1111 Claim for Progress Payment (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/1111.pdf>).

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 description and value of the milestone claimed as detailed in the Contract.
2. 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](mailto:asc.facturation-invoicing.csa@canada.ca)

PWGSC e-mail address:

[QueReclamationsMontreal/.QueMontrealClaims@tpsgc-pwgsc.gc.ca](mailto:QueReclamationsMontreal/.QueMontrealClaims@tpsgc-pwgsc.gc.ca)



3. 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.
4. The Contractor must not submit claims until all work identified in the claim is completed.

## **7.9 Certifications and Additional Information**

### **7.9.1 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.

### **7.9.2 SACC Manual Clauses**

SACC Manual clause [A3060C](#) (2008-05-12), Canadian Content Certification

## **7.10 Applicable Laws**

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

## **7.11 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 general conditions [2040](#) (2020-05-28), General Conditions - Research & Development, apply to and form part of the Contract;
- (c) Annex A, Statement of Work;
- (d) Annex B, Basis of Payment;
- (e) the Contractor's bid dated \_\_\_\_\_.

## **7.12 Foreign Nationals (Canadian Contractor)**

SACC Manual clause [A2000C](#) (2006-06-16) Foreign Nationals (Canadian Contractor)

## **7.13 Insurance**

SACC Manual clause [G1005C](#) (2016-01-28) Insurance - No Specific Requirement

## **7.14 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.

## 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."

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, mentioned in section **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.

c. 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.

Solicitation No. - N° de l'invitation  
9F045-190717/A  
Client Ref. No. - N° de réf. du client  
9F045-19-0717

Amd. No. - N° de la modif.  
File No. - N° du dossier  
MTB-9-42232

Buyer ID - Id de l'acheteur  
mtb 130  
CCC No./N° CCC - FMS No./N° VME

---

## **ANNEX A**

### **STATEMENT OF WORK**

The Statement of work will be at the end of this document.

## ANNEX B

### BASIS OF PAYMENT

1. **LABOUR:** at the following firm rates without overhead and profit

**CATEGORY (OR NAME)**

**FIRM HOURLY RATE**

\_\_\_\_\_  
\_\_\_\_\_  
Etc.

\$ \_\_\_\_\_  
\$ \_\_\_\_\_

Est.: \$ \_\_\_\_\_

2. **EQUIPMENT:** at laid down cost without markup  
(Specify type of equipment.)

Est.: \$ \_\_\_\_\_

3. **RENTALS:** at actual cost without markup  
(Specify what rentals.)

Est.: \$ \_\_\_\_\_

4. **MATERIALS AND SUPPLIES:** at laid down cost without  
markup (Specify what categories of materials and supplies.)

Est.: \$ \_\_\_\_\_

5. **TRAVEL AND LIVING EXPENSES:**

Est.: \$ \_\_\_\_\_

The Contractor will be reimbursed its authorized travel (*Annex A – Statement of work, 4.2.3 Travel in TABLE 8 ESTIMATED 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 allowances specified 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". Canada will not pay the Contractor any incidental expense allowance for authorized travel.

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

6. **SUBCONTRACTS:** at actual cost without markup  
(Identify subcontractors, if applicable.)

Est.: \$ \_\_\_\_\_

7. **OTHER DIRECT CHARGES:** at actual cost without markup  
(Specify what categories of direct charges.)

Est.: \$ \_\_\_\_\_

8. **OVERHEAD:** at a firm rate of \_\_\_\_% of item \_\_\_\_ above

Est.: \$ \_\_\_\_\_

9. **PROFIT:** at a firm rate of \_\_\_\_ of item \_\_\_\_ above

Est.: \$ \_\_\_\_\_

**Estimated Cost to a Limitation of Expenditure: \$ \_\_\_\_\_**  
**(Applicable Taxes extra)**

With the exception of the firm rate(s) and price(s), the amounts shown in the various items specified above are estimates only. Minor changes to these estimates will be accepted for billing purposes as the Work proceeds, provided that these changes have the prior approval of the Technical Authority, and provided that the estimated cost does not exceed the aforementioned Limitation of Expenditure.

## ANNEX C

### MANDATORY TECHNICAL CRITERIA, POINT RATED TECHNICAL CRITERIA and SELF-EVALUATION

#### 1. Mandatory Technical Criteria (MC)

The Bid must comply with the following Mandatory Technical Criteria in order to be evaluated under the Point Rated Technical Criteria. Any Bid which fails to meet any of the following Mandatory Technical Criteria will be declared non-responsive since the Bid will be declared ineligible.

TABLE #1 - Mandatory Criteria (MC)

Item	Mandatory Criteria	
MC1	<p>The bidder <b>MUST</b> provide a team with the knowledge and experience to perform the work described in the SOW: Annex A. The team (which includes sub-contractors and partners) <b>MUST</b> include at least one person who is employed by the Bidder itself. The team <b>MUST</b> include, as a minimum, the four (4) key members shown in Table 2 of the SOW. At least four (4) team members must possess PhDs in relevant fields of study. Experience of team members is to be demonstrated through recent work experience and scientific publications. The team as a whole <b>MUST</b> have pertinent expertise in remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation.</p>	<p><b>Are you able to provide this team?</b></p> <p><b>Mark the appropriate answer:</b></p> <p><b>YES</b> _____</p> <p><b>NO</b> _____</p>
MC2	<p>The bidder <b>MUST</b> include, within the proposal, resumes (curricula vitae) that describe each proposed team member's experience. Each resume should be no more than five pages, excluding lists of publications. Resumes that exceed the page limit will not be read or evaluated.</p> <p>The resumes <b>MUST</b> be up-to-date and should be submitted as an Appendix.</p> <p>Resumes of each proposed team member <b>MUST</b> include:</p> <ul style="list-style-type: none"> <li>• Name</li> <li>• Education</li> <li>• Work experience (including but not limited to roles and responsibilities, important and similar projects, etc.)</li> <li>• A list of scientific publications authored or co-authored by the team member</li> </ul>	<p><b>Are you able to provide a resume for each proposed resource?</b></p> <p><b>Mark the appropriate answer:</b></p> <p><b>YES</b> _____</p> <p><b>NO</b> _____</p>

<b>MC3</b>	<p>The bidder <b>MUST</b> include an organizational chart showing the structure of the team (which includes sub-contractors and partners) and the roles of each team member.</p> <p>The roles of the persons indicated in the organizational chart <b>should</b> correspond to their main roles in performing the Statement of Work SOW (Annex A).</p>	<p><b>Are you able to provide an organizational chart?</b></p> <p><b>Mark the appropriate answer:</b></p> <p><b>YES</b> _____</p> <p><b>NO</b> _____</p>
------------	--	--

## 2. Point-Rated Technical Criteria (RC)

Each Bid that meets the Mandatory Requirements specified in Table 1, will receive a Technical Score according to the point-rated criteria as specified in Table 2. The criteria are grouped under the following divisions:

1. Science Criteria
2. Engineering Criteria
3. Management Criteria

In conformity with the selection method, for the technical criteria ratings, the bidder must obtain a minimum score for each criterion and each subject, with a minimum final score of 75 points for criteria 1 to 3 inclusively.

"Evaluation Criteria and Benchmark Statements" contains a series of evaluation criteria, each supported by a set of benchmark statements (0, A, B, C, D). Each of these statements has a corresponding relative value:

- 0 (Null) = 0% of maximum point rating
- A (Poor) = 25% of maximum point rating
- B (Fair) = 50% of maximum point rating
- C (Good) = 75% of maximum point rating
- D (Excellent) = 100% of maximum point rating

**Table 2 below identifies:**

- a) The maximum point rating assigned to each criterion;
- b) The minimum point rating required for each criterion;
- c) The maximum point rating possible for each division (Science, Engineering and Management);
- d) The minimum point rating required for each division (Science, Engineering and Management);
- e) The maximum point rating possible for the overall score; and
- f) The minimum point rating required for the overall score.

It should be noted that the sum of all minimum scores is lower than the minimum overall score required, this is to allow flexibility in the scoring.

Table 2 – Point-Rated Technical Criteria (RC)		
	Maximum Score	Minimum Score
1. Science Criteria		
1.1. Modelling Earth’s Atmosphere	15	11
1.2. Remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation	10	7
1.3. Methodology	15	11
Maximum Score for Science Criteria		40
Minimum Score for Science Criteria		30
2. Engineering Criteria		
2.1. Instrument Modelling	20	14
2.2. Data Processing (retrieval of geophysical parameters)	20	14
Maximum Score for Engineering Criteria		40
Minimum Score for Engineering Criteria		30
3. Management Criteria		
3.1. Project Management Experience and Approach	10	7
3.2. Scientific Research Collaborations	10	7
Maximum Score for Management Criteria		20
Minimum Score for Management Criteria		15
Maximum Overall Score		100
Minimum Overall Score Requirement		75

All proposals will be evaluated by a panel of at least three persons. The overall final scores for each proposal will represent the consensus of the evaluators.

## 1. SCIENCE CRITERIA

### 1.1. MODELLING EARTH'S ATMOSPHERE

***This criterion assesses the contractor's proposed team's recent (within the last six years) experience, and computational capabilities, in the area of atmospheric modelling for the purpose of generating realistic input scenes for atmospheric remote sensing instruments: varying altitude, position on Earth, time of year, time of day, weather and pollution events, instrument position, pointing and field of view.***

***Maximum of 15 points can be achieved.***

0	Experience in atmospheric modelling is not addressed or is not adequately identified.
A	At least one proposed team member has at least six months of experience in atmospheric modelling.
B	At least two proposed team members each have at least nine months of experience in atmospheric modelling, including for the purpose of generating input scenes to remote sensing instruments.
C	Three proposed team members each have at least one year of experience in modelling Earth's atmosphere, including for the purpose of generating simulated input scenes for atmospheric remote sensing instruments, AND The Bid identifies the computational capabilities (software tools) that the contractor proposes to use to generate input scenes.
D	Three or more proposed team members each have at least one year of recent (within the last six years) experience in modelling Earth's atmosphere, including for the purpose of generating realistic simulated input scenes for atmospheric remote sensing instruments, AND The Bid clearly describes the computational capabilities (software tools) that the team proposes to use for atmospheric modelling, AND The team already possesses the computational capabilities (software tools) that they propose to use to generate realistic simulated input scenes.



## 1.2. REMOTE SENSING OF AEROSOLS, WATER VAPOUR, CLOUD MICROPHYSICAL PROPERTIES AND ATMOSPHERIC RADIATION

***This criterion assesses the contractor's proposed team's current (January 2014 to present) expertise in remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation.***

***Maximum of 10 points can be achieved.***

O	The proposed team members have not authored scientific articles in refereed journals, or the articles are not adequately identified in the proposal.
A	At least two proposed team members have authored scientific articles in refereed journals, but not in the last six years(January 2014 to present).
B	At least three proposed team members have authored scientific articles in refereed journals in the last six years (January 2014 to present), but the articles are not directly related to remote sensing of aerosols, water vapour, cloud microphysical properties or atmospheric radiation.
C	Three or more proposed team members have each authored two or more scientific articles in refereed journals in the last six years (January 2014 to present) directly related to remote sensing of aerosols, water vapour, cloud microphysical properties or atmospheric radiation, but the articles do not demonstrate that the team as a whole possesses expertise in all of these topics.
D	Four or more proposed team members have each authored multiple scientific articles in refereed journals in the last six years (January 2014 to present) directly related to remote sensing of aerosols, water vapour, cloud microphysical properties or atmospheric radiation, AND The scientific articles authored by the proposed team members demonstrate that the team as a whole possesses current expertise in all of these topics.

### 1.3. METHODOLOGY

***This criterion assesses the proposed methodology for generating simulated measurements by the ALI, SHOW and TICFIRE instruments, for a range of atmospheric conditions and orbital parameters, for each of the A-CCP architectures that includes the instruments; and for performing assessments of the science value of the measurements for the A-CCP mission.***

***Refer to section 4.1 of the SOW: Work breakdown structure, capabilities and methodologies.***

***Maximum of 15 points can be achieved.***

0	The Bid does not describe, or does not identify the proposed methodology.
A	<p>The Bid describes the proposed methodology but the information lacks adequate detail about the three aspects:</p> <ul style="list-style-type: none"> <li>- Generating simulated data and data products;</li> <li>- Assessing science value of the measurements; and</li> <li>- The proposed input sources and computational tools.</li> </ul>
B	<p>The Bid describes the proposed methodology but the information lacks adequate detail about two of the three aspects:</p> <ul style="list-style-type: none"> <li>- Generating simulated data and data products;</li> <li>- Assessing science value of the measurements; and</li> <li>- The proposed input sources and computational tools.</li> </ul>
C	<p>The Bid describes the proposed methodology but the information lacks adequate detail about one of the three aspects:</p> <ul style="list-style-type: none"> <li>- Generating simulated data and data products;</li> <li>- Assessing science value of the measurements; and</li> <li>- The proposed input sources and computational tools.</li> </ul>
D	<p>The Bid describes the proposed methodology to generate:</p> <ul style="list-style-type: none"> <li>- Realistic simulated input scenes for the ALI, SHOW and TICFIRE instruments;</li> <li>- Accurate simulations of instrument output (raw data, calibration data, measurement errors, etc.); and</li> <li>- Realistic simulated ALI, SHOW and TICFIRE data products,</li> </ul> <p>AND</p> <p>The Bid describes the proposed methodology to assess the science impact of measurements:</p> <ul style="list-style-type: none"> <li>- To be made by each of the ALI, SHOW and TICFIRE instruments on its own; and</li> <li>- From combinations of two and three of these instruments (synergies),</li> </ul> <p>AND</p> <p>The Bid lists, describes and provides references to scientific publications about:</p> <ul style="list-style-type: none"> <li>- The input data sources the contractor proposes to use;</li> <li>- The computational tools the contractor has already developed, or proposes to adapt or develop.</li> </ul>

## 2. ENGINEERING CRITERIA

### 2.1 INSTRUMENT MODELLING

***This criterion assesses the contractor's proposed team's expertise and computational capabilities in modelling of optical remote sensing instruments for the purpose of generating accurate simulations of instrument output (synthetic Level 0 data) as a function of atmospheric input scenes, instrument characteristics and operating parameters.***

***Level 0, Level 1 and Level 2 data are defined in section 1.5 of the SOW.***

***Maximum of 20 points can be achieved.***

0	Experience in modelling of optical remote sensing instruments is not addressed, or is not adequately identified.
A	At least one proposed team members has at least three months experience in modelling of optical remote sensing instruments.
B	At least two proposed team members each have at least three months experience in modelling of optical remote sensing instruments including generating accurate simulations of instrument output.
C	Three proposed team members each have at least six months experience in modelling of optical remote sensing instruments for the purpose of generating accurate simulations of instrument output, AND The Bid identifies the computational capabilities (software tools) that the contractor proposes to use for this purpose.
D	Three or more proposed team members each have at least six months recent (within the last six years) experience in modelling of optical remote sensing instruments for the purpose of generating accurate simulations of instrument output as a function of atmospheric input scenes, instrument characteristics and operating parameters, AND The Bid clearly describes the computational capabilities (software tools) that the team proposes to use for this purpose, AND The team already possesses the computational capabilities (software tools) that they propose to use to generate accurate simulations of instrument output.

## 2.2 DATA PROCESSING (RETRIEVAL OF GEOPHYSICAL PARAMETERS)

***This criterion assesses the Bidder's proposed team's expertise and computational capabilities in processing atmospheric remote sensing data (retrieval of geophysical parameters) for the purpose of generating synthetic Level 1 and Level 2 data products, including the measurement error statistics required for assimilation into Earth System Models, from the simulated instrument output (synthetic Level 0 data), accounting for relevant satellite orbital and viewing geometry configurations.***

***Level 0, Level 1 and Level 2 data are defined in section 1.5 of the SOW.***

***Maximum of 20 points can be achieved.***

0	Experience in processing remote sensing data (retrieval of geophysical parameters) is not addressed, or is not adequately identified.
A	At least one proposed team members has at least one year of experience in processing remote sensing data (retrieval of geophysical parameters).
B	At least two proposed team members each have at least one year of experience in processing atmospheric remote sensing data (retrieval of geophysical parameters).
C	Three proposed team members each have at least one year of experience in processing atmospheric remote sensing data (retrieval of geophysical parameters) for the purpose of generating Level 1 and Level 2 data products, AND The Bid identifies the computational capabilities (software tools) that the contractor proposes to use to generate synthetic Level 1 and Level 2 data products.
D	Three or more proposed team members each have at least one year of recent (within the last six years) experience in processing atmospheric remote sensing data (retrieval of geophysical parameters) for the purpose of generating Level 1 and Level 2 data products, AND The Bid clearly describes the computational capabilities (software tools) with which the team proposes to generate synthetic Level 1 and Level 2 data products, including the measurement error statistics that are required for assimilation into Earth System Models, from the simulated instrument output (synthetic Level 0 data), accounting for relevant satellite orbital and viewing geometry configurations, AND The team already possesses the computational capabilities (software tools) that they propose to use to generate accurate simulations of instrument output.

### 3. MANAGEMENT CRITERIA

#### 3.1. PROJECT MANAGEMENT EXPERIENCE AND APPROACH

***This criterion assesses the proposed contractor's recent (since January 2014) experience in project management, and evaluates the completeness of the management plan for the work to be done under this contract (work packages, personnel allocation, detailed schedule).***

***Refer in particular to the following Sections of the SOW:***

***1.2 Objectives***

***1.4 Roles & Responsibilities***

***3 Contract Scope, Schedule and Documentation***

***4 Work Description***

***5 Contract Deliverables***

***6 Schedule***

***Maximum of 10 points can be achieved.***

0	The proposal does not address this criterion.
A	One proposed team member has less than two years experience in project management. Methods for coordinating the work, and tracking and controlling the progress are provided in a limited way. Roles and responsibilities of team members are not clearly defined.
B	One proposed team member has at least two years of experience in project management. Methods for coordinating the work, and tracking and controlling the progress are identified but are not fully correlated to the work for this contract. The roles and responsibilities are not clearly defined for key team members.
C	At least two proposed team member each have at least two years of recent (since January 2014) experience in managing research projects of similar complexity, AND The work breakdown structure and schedule are provided and correlated to the work for this contract. AND The roles and responsibilities of key team members are clearly defined.
D	At least two proposed team members each have at least two years of recent (since January 2014) experience in managing research projects of similar complexity, AND The work breakdown structure and schedule are well described and correlated to the work for this contract, AND The methods of coordinating the work, and tracking and controlling the progress of the team, are logical and well described, AND The roles and responsibilities of all team members are clearly defined.

### 3.2. SCIENTIFIC RESEARCH COLLABORATIONS

***This criterion assesses the Bidder's proposed team's recent (since January 2014) research collaborations with scientists in Canadian universities and in Environment and Climate Change Canada (ECCC), and the relevance of those collaborations for this contract.***

***Maximum of 10 points can be achieved.***

0	The proposal does not address this criterion.
A	One proposed team member has collaborated briefly (less than two years) in research with a scientist in a Canadian university.
B	At least two proposed team members each have at least two years of experience performing research in collaboration with scientists from Canadian universities or with scientists from ECCC, but those collaborations are not relevant to the scientific assessments for this contract.
C	At least three proposed team members have at least two years of recent (since January 2014) experience performing atmospheric science research in collaboration with scientists from Canadian universities and with scientists from ECCC, AND Those scientific collaborations are relevant to the scientific assessments for this contract.
D	At least three proposed team members have at least two years of recent (since January 2014) experience performing atmospheric science research in collaboration with scientists from Canadian universities and with scientists from ECCC, AND Those scientific collaborations are ongoing, AND The science research collaborations will be useful in carrying out the scientific assessments for this contract.

## Bidder's Self-Evaluation

The Bidder is encouraged to provide a self-evaluation and substantiation, which must be submitted as appendix.

For each of the applicable criteria;

- 1) Select the benchmark statement (0, A, B, C or D) (as defined) that best represents the Bid being submitted;
- 2) Provide the corresponding Score as described in table 3 below; and
- 3) Provide the substantiation for the selected benchmark statement and summarized cross-reference(s) to the Bid, if applicable.

In reference to point 3) above, the substantiation must be concise yet sufficiently comprehensive to ensure that the evaluators get a good overall appreciation of the Bid's merit relative to the specific criterion. Cross-references to appropriate sections of the Bid are acceptable provided that the essence of the referenced information is summarized in the substantiation.

For convenience, a template for the Self-Evaluation Matrix is provided in Table 3 below. Enter each criterion number, the mark selected, the score and the substantiation. It is expected that approximately 300 words should be sufficient to make your case for the rating chosen in the substantiation column. Any documents that would support the substantiation should be added.

**Table 3 – Self-Evaluation Matrix**

Organization: Mission Selected for Proposal:			
Criteria	Mark	Score (Points)	Substantiation
Ex.: 2.2 (Criterion number)	Ex.: C (Benchmark statement 0, A, B, C or D)	Ex.: 15	Criterion substantiation and Bidder's Bid cross-reference.  It is expected that 300 words or so should be sufficient to make your case for the rating chosen.

Solicitation No. - N° de l'invitation  
9F045-190717/A  
Client Ref. No. - N° de réf. du client  
9F045-19-0717

Amd. No. - N° de la modif.  
File No. - N° du dossier  
MTB-9-42232

Buyer ID - Id de l'acheteur  
mtb 130  
CCC No./N° CCC - FMS No./N° VME

---

## ANNEX D

### 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);



---

## ANNEX E

### CERTIFICATIONS

#### **AT THE CLOSING DATE AND HOUR OF THE INVITATION OR BEFORE THE ISSUANCE OF THE CONTRACT, THE OFFERORS MUST PROVIDE THE FOLLOWING CERTIFICATIONS.**

---

All the criteria identified below are MANDATORY. Each criteria must be met and documentation provided in order to demonstrate the degree to which it is met.

Please identify where the substantial document is located in your offer.

Canada will not evaluate information such as references to a website address where supplementary information can be found.

Only those offers that meet all the mandatory technical criteria in the table below will be subject to further evaluation.

If these documents have not been provided at bid closing, PWGSC will notify the bidder, offeror or supplier that they are required to provide them within **two (2) business days** following notification by PWGSC.

(Note: this time requirement reflects PWGSC's expectation that these documents ought to be readily available to a bidder, offeror or supplier.)

The offers that fail to meet all these conditions will be rejected and will be given no further consideration.

TABLE #1 - Mandatory Criteria (MC)		
Item	Mandatory Criteria	
MC2	<p>The bidder <b>MUST</b> include, within the proposal, resumes (curricula vitae) that describe each proposed team member's experience. Each resume should be no more than five pages, excluding lists of publications. Resumes that exceed the page limit will not be read or evaluated.</p> <p>The resumes <b>MUST</b> be up-to-date and should be submitted as an Appendix.</p> <p>Resumes of each proposed team member <b>MUST</b> include:</p> <ul style="list-style-type: none"><li>• Name</li><li>• Education</li><li>• Work experience (including but not limited to roles and responsibilities, important and similar projects, etc.)</li><li>• A list of scientific publications authored or co-authored by the team member</li></ul>	<p>Indicate the page where this information is listed:</p> <p>_____</p>
MC3	<p>The bidder <b>MUST</b> include an organizational chart showing the structure of the team (which includes sub-contractors and partners) and the roles of each team member.</p> <p>The roles of the persons indicated in the organizational chart <b>should</b> correspond to their main roles in performing the Statement of Work SOW (Annex A).</p>	<p>Indicate the page where this information is listed:</p> <p>_____</p>

# **Canadian Space Agency A-CCP Program**

## **Modelling, Simulations and Scientific Analyses for the A-CCP Study**

### **Statement of Work (SOW)**

**June 2020**

Livelihood # 43900120

**FOR CANADIAN SPACE AGENCY USE ONLY**

This document and the information contained herein are not to be used for any purpose other than to accomplish Canadian Space Agency programs and projects whether they are completely Canadian initiatives or in cooperation with International Partners. The contents of this document are not to be disclosed or transferred in whole or in part, to any third party without the prior written consent of the Canadian Space Agency.

© HER MAJESTY THE QUEEN IN RIGHT OF CANADA 2020



Canadian Space  
Agency

Agence Spatiale  
Canadienne

This Page Intentionally Left Blank

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	BACKGROUND.....	1
1.2	OBJECTIVES.....	3
1.3	DOCUMENT CONVENTIONS.....	4
1.4	ROLES & RESPONSIBILITIES.....	4
1.5	DEFINITIONS OF LEVEL 0, LEVEL 1 AND LEVEL 2 DATA.....	5
<b>2</b>	<b>DOCUMENTS.....</b>	<b>6</b>
2.1	REFERENCE DOCUMENTS.....	6
<b>3</b>	<b>CONTRACT SCOPE, SCHEDULE AND DOCUMENTATION.....</b>	<b>7</b>
3.1	GENERAL.....	7
3.2	PROJECT MANAGEMENT.....	7
3.2.1	<i>Project Planning, Performance and Leadership.....</i>	<i>7</i>
3.2.2	<i>Project Management Control.....</i>	<i>8</i>
3.2.3	<i>Project Schedule and Timeline.....</i>	<i>8</i>
3.2.4	<i>Project Management Reporting.....</i>	<i>8</i>
3.2.5	<i>Action Item Log.....</i>	<i>8</i>
3.2.6	<i>Reviews &amp; Meetings.....</i>	<i>8</i>
3.2.7	<i>Documentation.....</i>	<i>9</i>
<b>4</b>	<b>WORK DESCRIPTION.....</b>	<b>10</b>
4.1	WORK BREAKDOWN STRUCTURE, CAPABILITIES AND METHODOLOGIES.....	10
4.2	WP1: PROJECT AND CONFIGURATION MANAGEMENT.....	11
4.2.1	<i>Project Management.....</i>	<i>11</i>
4.2.2	<i>Configuration Management.....</i>	<i>11</i>
4.2.3	<i>Travel.....</i>	<i>11</i>
4.3	WP2: ALI SIMULATION AND SUPPORT.....	12
4.3.1	<i>Level 0-2 Simulator.....</i>	<i>12</i>
4.3.2	<i>Instrument Refinement.....</i>	<i>12</i>
4.3.3	<i>NASA A-CCP Study Support.....</i>	<i>12</i>
4.4	WP3: SHOW SIMULATION AND SUPPORT.....	13
4.4.1	<i>Level 0-2 Simulator.....</i>	<i>13</i>
4.4.2	<i>Instrument Refinement.....</i>	<i>13</i>
4.4.3	<i>NASA A-CCP Study Support.....</i>	<i>13</i>
4.5	WP4: TICFIRE SIMULATION AND SUPPORT.....	13
4.5.1	<i>Level 0-2 Simulator.....</i>	<i>13</i>
4.5.2	<i>Instrument Refinement.....</i>	<i>14</i>
4.5.3	<i>NASA A-CCP Study Support.....</i>	<i>14</i>
4.6	WP5: DATA PRODUCT SIMULATIONS AND SCIENTIFIC ASSESSMENTS.....	14
4.7	WP6: PROMOTE AWARENESS OF A-CCP & THE CANADIAN INSTRUMENTS.....	14
<b>5</b>	<b>CONTRACT DELIVERABLES.....</b>	<b>15</b>
5.1	SOFTWARE.....	15
5.2	DOCUMENTATION.....	15
<b>6</b>	<b>SCHEDULE.....</b>	<b>16</b>
<b>7</b>	<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>17</b>
	<b>APPENDICES.....</b>	<b>18</b>
<b>A</b>	<b>CONTRACT DATA REQUIREMENTS LIST (CDRL).....</b>	<b>19</b>

A.0	PROJECT MANAGEMENT .....	20
A.1	SAFETY AND MISSION ASSURANCE (S&MA).....	20
A.2	ENGINEERING.....	20
A.3	OPERATIONS .....	21
<b>B</b>	<b>DATA ITEMS DESCRIPTIONS (DIDS).....</b>	<b>22</b>

## LIST OF TABLES

TABLE	PAGE
TABLE 1 SCIENCE STUDY OBJECTIVES.....	3
TABLE 2 KEY CONTRACT TEAM MEMBERS.....	4
TABLE 3 GENERAL REQUIREMENTS .....	7
TABLE 4 A-CCP HIGH-LEVEL PROGRAM ESTIMATED TIMELINE.....	8
TABLE 5 MEETINGS .....	9
TABLE 6 PROPOSED CONTRACT DATA REQUIREMENTS LIST (CDRL) .....	9
TABLE 7 WORK PACKAGES.....	10
TABLE 8 ESTIMATED TRAVEL .....	12
TABLE A-1 – CDRL.....	20

# 1 INTRODUCTION

## 1.1 BACKGROUND

NASA's Earth Science Division is pursuing measurement of the five highest priority targeted Earth observables identified by the National Academies of Sciences, Engineering, and Medicine in the report entitled "Thriving on Our Changing Planet: A Decadal Survey for Earth Observations from Space" [RD-01]. In late 2018 NASA began a three year multi-center study of two of the priority designated observables—Aerosols and Cloud-Convection-Precipitation (A-CCP)—to leverage the advantages of a single synergistic observing system. This pre-formulation study [RD-02] for an observing system that includes space-based instruments and sub-orbital instruments will conclude in late 2021. It will be followed by a Mission Concept Review in summer 2022, and initiation of the mission in autumn 2022.

In December 2018, NASA invited the Canadian Space Agency to participate in a workshop concerning the A-CCP pre-formulation study. The CSA extended this invitation to scientists from Environment and Climate Change Canada (ECCC) and to scientists with relevant expertise from Canadian universities. The Canadian delegation to this workshop made a presentation about potential Canadian contributions to the mission [RD-03]. This was followed up by submission of technical information about potential Canadian instrument contributions to the A-CCP mission. These are:

- Aerosol Limb Imager (ALI): a hyperspectral limb imager covering the visible and near infrared spectral range. The instrument is also capable of resolving linear polarization of the input limb radiance. The instrument is optimized for high spatial resolution stratospheric aerosol, volcanic plume and thin cirrus cloud measurements. It is designed to provide spectrally resolved aerosol extinction and particle size parameters with high vertical resolution and cross-track coverage.
- Spatial Heterodyne Observations of Water (SHOW) is an imaging spectrometer for dense profiling of water vapor above clouds. SHOW is designed to vertically resolve atmospheric profiles of water by measuring limb scattered sunlight. The instrument utilizes an interferometric technique known as Spatial Heterodyne Spectroscopy (SHS), where the spectral range is limited to a narrow vibrational absorption band of water vapour in the near infrared.
- Thin Ice Clouds Far InfraRed Experiment (TICFIRE) is a nadir multispectral cloud imager with on-board blackbody calibration system and far infrared spectral channels. The primary data product is spectral radiance for assimilation in operational forecasting systems. The observations allow for improved measurement accuracy of the effective cloud particle size along with optical depth, cloud top altitudes, and temperature. The instrument also measures atmospheric low concentration water vapour in cold regions, near the tropopause, and at high latitudes near the ground, improving the measurement accuracy of traditional thermal IR nadir observations.

Initial NASA assessments have indicated that the Canadian instruments ALI, SHOW and TICFIRE will enhance baseline observations and may be accommodated on A-CCP spacecraft.

In June 2019, following the Pasadena workshop, NASA formally invited the CSA and collaborating organizations (ECCC, Universities): 1) to investigate potential partnership in the A-CCP observing system through contribution of the three Canadian space-based instruments and a key radar subsystem, and, 2) to participate in the A-CCP Study Team in order to help identify the best A-CCP architectures (satellite, sub-orbital and instrument configurations) for eventual implementation as an Earth Science mission. As part of this study, inclusion of the Canadian instruments on NASA spacecraft is being assessed by NASA from technical, scientific, and cost perspectives. Simulations of measurements to be made by the Canadian instruments are required for each A-CCP satellite architecture in order to assess the science value of the Canadian instruments with respect to the A-CCP Science and Applications Traceability Matrix (SATM) [RD-02RD-04], and to the other instruments from NASA and international partners. These simulated measurements must be produced by Canadian scientists who are experts in space-based atmospheric remote sensing and experts in the ALI, SHOW and TICFIRE instruments.

CSA governance approval to proceed with the Options Analysis phase for the A-CCP Earth Science Mission was granted in July 2019. This decision took into consideration letters of support from CSA's Atmospheric Science Advisory Committee (ASAC), Environment and Climate Change Canada (ECCC), and the participating university scientists. Subsequently, CSA has:

- Issued contracts for the preparation of the User and Science Requirements (URD) for the three instruments;
- Prepared RFPs for Phase 0 studies of each of the three instruments; and,
- Nominated four ECCC and five university scientists to A-CCP study teams—Science and Applications Leadership Team (SALT), Science Impact Team (SIT), Applications Impact Team (AIT), and Science Community Committee (SCC).

The main purposes of this contract “Modelling, Simulations and Scientific Analyses for the A-CCP Study” are to:

- Perform modelling of the atmosphere and of the ALI, SHOW and TICFIRE instruments;
- Generate simulated measurements by the instruments, for a range of atmospheric conditions and orbital parameters, for each of the A-CCP architectures that includes the instruments;
- Perform assessments of the science value of the ALI, SHOW and TICFIRE observations for the A-CCP mission, considering observations by instruments from NASA and partners;
- Perform assessments of the synergies between the ALI, SHOW and TICFIRE instruments (information that can be derived from combinations of the observations).
- Support assessments by Environment and Climate Change Canada (ECCC) of the value of the A-CCP observations for improving Canadian Earth System Models and for improving environmental predictions (weather, air quality, hydrology) and climate change projections made with these Earth System Models.

Additionally, this contract will:

- Provide science support to the industry-led Phase 0 studies;



- Support participation by Canadian university scientists in SIT and SCC activities;
- Promote awareness of the A-CCP opportunity and the value of the Canadian instruments within the Canadian and the United States atmospheric science communities; and,
- Support CSA business case development for investment in the A-CCP mission.

This contract will enable Canada to contribute fully to the A-CCP pre-formulation study, and to assess the scientific benefits that the Canadian instrument contributions will bring to each of the A-CCP architectures that includes them.

## 1.2 OBJECTIVES

The objectives of this statement of work are:

### TABLE 1 SCIENCE STUDY OBJECTIVES

- OB1. Support the NASA A-CCP pre-formulation Study with:
- Modelling of atmospheric input scenes, orbit and instrument viewing geometry, instrument throughput and data retrievals;
  - Simulated Level 0, Level 1 and Level 2 data products (as per data product descriptions in the User and Science Requirements Documents);
  - Scientific analyses in support of the A-CCP Architecture studies and Science Impact Team assessments of science value;
    - Assessment of the science impact of measurements to be made by each of the ALI, SHOW and TICFIRE instruments on its own;
    - Assessment of the science impact of the measurements from combinations of two and three of these instruments (synergies);
    - Traceability of the ALI, SHOW and TICFIRE instruments' Level 0, Level 1 and Level 2 data products to the A-CCP SATM;
  - Development and testing of instrument data product validation methodologies;
  - Canadian university scientist participation in, and contributions to, the A-CCP Study teams: Science Impact Teams (SIT-Aerosols and SIT-Clouds, Convection, Precipitation) and the Science Community Committee (SCC).
- OB2. Support ECCC studies, simulations and assessments of the value of assimilating the data into Numerical Weather Prediction and Earth System Models.
- OB3. Support Phase 0 studies by industry with scientific assessments and engineering opinions.
- OB4. Support CSA mission management activities (telecoms, meetings, workshops) and business case development.
- OB5. Promote awareness of the A-CCP opportunity and value of the Canadian instruments for atmospheric science (conferences, workshops) in Canada, the USA and internationally.

### 1.3 DOCUMENT CONVENTIONS

The following verbs, as used in this document, have specific meaning as indicated below:

- “shall” indicates a mandatory requirement.
- “must” indicates a mandatory requirement.
- “should” indicates a preferred but not mandatory alternative.
- “may” indicates an option.
- “will” indicates a statement of intention or fact.

### 1.4 ROLES & RESPONSIBILITIES

The contractor shall perform the work described in the following Sections:

- 3 – Contract Scope, Schedule and Documentation
- 4 – Work Description
- 5 – Contract Deliverables

The contractor shall also:

- Lead collaborative activities with scientists from Canadian universities and provide travel support (reimburse costs) for Canadian university scientists to attend contract-related meetings at CSA, as well as SIT meetings, SCC meetings and A-CCP workshops in the USA;
- Coordinate collaborative activities with scientists from ECCC who:
  - Contribute science expertise in the areas of atmospheric modelling and scientific assessments;
  - Communicate ECCC science and applications priorities for the A-CCP mission;
  - Perform scientific assessments of the simulated data products, including through assimilation of the simulated data products into ECCC Numerical Weather Prediction and Earth System Models;
  - Advise on relevant ECCC sub-orbital observations (ground- and air-based instrument systems across Canada and especially in the Arctic) and potential impacts or benefits for the space-based observations.
- Coordinate information sharing between Canadian collaborators and the CSA as well as information exchange between Canadian collaborators and the NASA study teams.

The contractor must propose a team that includes, as a minimum, the four (4) key members shown in Table 2 below. The team may include persons whose salaries are paid by the contract as well as persons whose time is contributed at no cost to the contract. At least four (4) of the team members must possess PhDs in relevant fields of study and the team as a whole must demonstrate through recent work experience and scientific publications that they have pertinent expertise in remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation.

**TABLE 2 KEY CONTRACT TEAM MEMBERS**

	Name	Role	Affiliation	Activities
1	TBC	Contract Management	TBC	Contract management
2	TBC	ALI Lead	TBC	ALI simulations and support
3	TBC	SHOW Lead	TBC	SHOW simulations and support
4	TBC	TICFIRE Lead	TBC	TICFIRE simulations and support

During performance of the contract, the contractor must also respect the two following clauses:

- 1) No substitutions of team members can be made during the first 90 days of the contract (except due to unforeseeable circumstances beyond the contractor's control);
- 2) The contractor must provide 15 working days advance notice of any proposed key personnel substitutions, to which the contract Technical Authority will respond within 10 working days.

## **1.5 DEFINITIONS OF LEVEL 0, LEVEL 1 AND LEVEL 2 DATA**

Level 0: Reconstructed, unprocessed instrument and payload data at full resolution, with any and all communication artefacts (e.g. synchronization frames, communication headers, duplicate data) removed.

Level 1: Reconstructed, unprocessed instrument data at full resolution, time-referenced, and annotated with ancillary information, including location, pointing, temperature and calibration coefficients computed and appended but not applied. This data is processed to sensor units but still un-calibrated.

Level 2: Derived geophysical variables from the Level 1 source data along the satellite orbit. The data is reported at the same temporal or spatial resolution and location as Level 1 source data.

## 2 DOCUMENTS

Unless otherwise specified, in the case of conflict between this document and the documents listed below, this document shall take precedence. All documents are the latest version in effect at time of order. Note: Actual titles may not be exact as written.

### 2.1 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.

RD	Document Number	Revision	Title
RD-01	N/A	January 2018	US Decadal Strategy for Earth Observation, <a href="http://nap.edu/24938">http://nap.edu/24938</a>
RD-02	N/A	Dec 4, 2018	A-CCP Study Plan <a href="https://drive.google.com/file/d/1AuZvdiOIKLVmqBcUBo-K-GwsqSiKhES/view?usp=sharing">https://drive.google.com/file/d/1AuZvdiOIKLVmqBcUBo-K-GwsqSiKhES/view?usp=sharing</a>
RD-03	N/A	April 04 2019	Potential for Canadian Contributions to A-CCP, presentation to the A-CCP workshop April 2019. <a href="https://drive.google.com/file/d/1P0O6xYFlkQ1fla2s yiGPok3Te9ef-siP/view?usp=drive_web">https://drive.google.com/file/d/1P0O6xYFlkQ1fla2s yiGPok3Te9ef-siP/view?usp=drive_web</a>
RD-04	N/A	SATM-E (SATM-F anticipated Summer 2020)	A-CCP mission level Science and Applications Traceability Matrix <a href="https://science.nasa.gov/science-pink/s3fs-public/atoms/files/ACCP_SATM_Rel_E_TAGGED.pdf">https://science.nasa.gov/science-pink/s3fs-public/atoms/files/ACCP_SATM_Rel_E_TAGGED.pdf</a>

### 3 CONTRACT SCOPE, SCHEDULE AND DOCUMENTATION

#### 3.1 GENERAL

The Contractor will perform the following high-level tasks:

**TABLE 3 GENERAL REQUIREMENTS**

ID	Description
GR1.	Project Management activities including Configuration Management (CM).
GR2.	End to end simulations of the Aerosol Limb Imager (ALI), the Spatial Heterodyne Observations of Water (SHOW), and the Thin Ice Clouds in the Far InfraRed Experiment (TICFIRE) instruments.
GR3.	Provision of simulated measurements by the ALI, SHOW and TICFIRE instruments in support to the NASA assessment of potential A-CCP architectures and the Canadian assessments of the science value of the measurements.
GR4.	Assessment of the science value of the data products, and the benefits to Canada provided by the Canadian instruments.
GR5.	Support to ECCC researchers performing modelling, simulations, and scientific assessments with the simulated measurements by ALI, SHOW and TICFIRE, ECCC's Earth System Models and related supercomputing infrastructure.
GR6.	Support to the Industry Phase 0 study contracts for ALI, SHOW and TICFIRE on A-CCP.
GR7.	Promotion of the A-CCP opportunity and value of the Canadian instruments for atmospheric science in Canada, the USA and internationally.

#### 3.2 PROJECT MANAGEMENT

##### ***3.2.1 Project Planning, Performance and Leadership***

The Contractor shall plan and manage the work to be performed under this contract in such a manner as to achieve project performance, scope, quality and schedule requirements of this SOW.

The Contractor shall provide the technical leadership and support necessary to ensure effective and efficient performance of all contract and sub-contract efforts and activities.

The Contractor shall dedicate experienced personnel, and implement sub-contracts as required for services of experts in other universities, in all the disciplines required to carry out the work.

The Contractor shall provide the necessary leadership to effectively manage the collaborations with scientists from ECCC and Canadian universities, as well as the collaborations with the industry contractors leading the Phase 0- studies, in keeping with the project objectives.

### **3.2.2 Project Management Control**

The Contractor shall establish and maintain a close management and technical interface with the Technical Authority (TA) in order to ensure a coordinated program effort that will meet or exceed the project objectives and maintain the timeline defined in section 3.2.3 within budget and personnel availability constraints.

### **3.2.3 Project Schedule and Timeline**

The contractor shall provide services that accommodates the overall Aerosols–Cloud, Convection, Precipitation (A-CCP) Study schedule as described in Table 4 below.

**TABLE 4 A-CCP HIGH-LEVEL PROGRAM ESTIMATED TIMELINE**

Milestone	Timeline Description	Date
TL1.	Phase 0 contracts to industry begin.	Summer 2020
TL2.	Initial A-CCP observing system architecture assessments are down-selected to the best three candidate observing systems for further assessment.	December 2020
TL3.	In-depth assessment of the three best candidate observing system architectures.	January – August 2021
TL4.	Canadian phase 0 instrument studies conclude feasibility, costs, technology development priorities.	August 2021
TL5.	A-CCP Study Final Report to NASA HQ recommending the optimal architecture.	November 2021
TL6.	A-CCP Concept Study Review.	December 2021 to June 2022
TL7.	NASA Phase A begins.	October 2022

### **3.2.4 Project Management Reporting**

The contractor shall produce monthly progress reports as per CDRL PM-100.

The contractor shall report on Configuration Management (CM) as per the Software Configuration Management Plan (CDRL SMA-300).

### **3.2.5 Action Item Log**

The contractor shall maintain Action Item log according to PM-104.

### **3.2.6 Reviews & Meetings**

The contractor shall conduct meetings as per Table 5.

**TABLE 5 MEETINGS**

<b>Meeting Description</b>	<b>Completion Date</b>	<b>Location</b>
Kick-off Meeting	Contract Award + 2 weeks	Contractor or CSA, TBD
Programmatic/Technical Status	Bi-Weekly	Teleconference
Progress Review #1	Contract Award + 6 months	Teleconference
Progress Review #2	Contract Award + 12 months	Contractor
Progress Review #3	Contract Award + 18 months	Teleconference
Final Review	Contract Award + 21 months	CSA

For each meeting defined in Table 5, the contractor shall produce PM-101, PM-102 and PM-103.

For each meeting defined in Table 5, the contractor shall produce a presentation package as required and shall submit it to CSA three days in advance.

### **3.2.7 Documentation**

The contractor shall deliver all proposed documents shown in Table 6.

**TABLE 6 PROPOSED CONTRACT DATA REQUIREMENTS LIST (CDRL)**

<b>CDRL</b>	<b>Deliverable</b>	<b>CDRL</b>	<b>Due Date</b>
<b>1</b>	Monthly Progress Reports	PM-100	7 <sup>th</sup> of each month
<b>2</b>	ALI Instrument & Simulator Report	CF	CA + 18 months
<b>3</b>	SHOW Instrument & Simulator Report	CF	CA + 18 months
<b>4</b>	TICFIRE Instrument & Simulator Report	CF	CA + 18 months
<b>5</b>	Data Products Assessment Report	CF	CA + 21 months
<b>6</b>	ALI Simulator Software	SMA-300, SMA-380, EN-400, OP-800	CA + 21 months
<b>7</b>	SHOW Simulator Software	SMA-300, SMA-380, EN-400, OP-800	CA + 21 months
<b>8</b>	TICFIRE Simulator Software	SMA-300, SMA-380, EN-400, OP-800	CA + 21 months

## 4 WORK DESCRIPTION

### 4.1 WORK BREAKDOWN STRUCTURE, CAPABILITIES AND METHODOLOGIES

The work to be performed by the contractor is divided into the following major work packages (Table 7). The contractor may suggest changes to this work breakdown structure to make it more logical, practical or otherwise better for contract management and reporting.

**TABLE 7 WORK PACKAGES**

	Title
WP1.	Project and Configuration Management
WP2.	ALI Simulation and Support
WP3.	SHOW Simulation and Support
WP4.	TICFIRE Simulation and Support
WP5.	Data Products Simulation and Scientific Assessments
WP6.	Promote Awareness of A-CCP and the Canadian instruments

In order to address the purposes of this contract as described in Section 1.1, and to attain the objectives listed in Section 1.2, the contractor and its sub-contractors shall have and use the following:

- 1) Orbital and viewing geometry modelling capabilities (software tools) to calculate instrument position and field of view for varying input parameters such as orbital parameters, spacecraft attitude, time of year, time of day, etc..
- 2) Expertise and computational capabilities in the area of modelling Earth's atmosphere for the purpose of generating realistic simulated input scenes for remote sensing instruments: varying altitude, position on Earth, time of year, time of day, weather and pollution events, instrument position, pointing and field of view.
- 3) Expertise and computational capabilities in end-to-end modelling of remote sensing instruments for the purpose of generating accurate simulations of instrument output (raw data, calibration data, measurement errors, etc.) as a function of atmospheric input scenes, orbital and viewing geometries, instrument characteristics and operating parameters.
- 4) Expertise and computational capabilities in processing atmospheric remote sensing data (retrieval of geophysical parameters) for the purpose of generating level 1 and level 2 data products, including the measurement error statistics required for assimilation into Earth System Models.
- 5) Expertise in remote sensing of aerosols, water vapour, cloud microphysical properties and atmospheric radiation.
- 6) Established scientific research collaborations with scientists in other Canadian universities and in ECCC.

The contractor shall demonstrate in their proposal that they and their sub-contractors have the expertise, computational capabilities and research collaborations listed above.



The contractor shall describe in their proposal the proposed methodologies to:

- generate realistic simulated input scenes for the ALI, SHOW and TICFIRE instruments;
- generate accurate simulations of instrument output (raw data, calibration data, measurement errors, etc.);
- generate realistic simulated ALI, SHOW and TICFIRE data products.

The contractor shall describe in their proposal the proposed methodologies to:

- Assess the science impact of measurements to be made by each of the ALI, SHOW and TICFIRE instruments on its own;
- Assess the science impact of the measurements from combinations of two and three of these instruments (synergies).

The proposal shall explicitly list, describe and provide references to publications about:

- The input data sources the contractor proposes to use;
- The computational tools the contractor has already developed;
- The computational tools the contractor proposes to adapt or develop.

The contractor shall provide schematic diagrams to accompany the textual descriptions of the methodology for the purpose of facilitating comprehension.

## **4.2 WP1: PROJECT AND CONFIGURATION MANAGEMENT**

### ***4.2.1 Project Management***

The contractor shall plan and manage the work to achieve the project performance, scope, quality, cost, schedule and reporting requirements of this SOW. This includes the selection of experienced personnel and the issuance of sub-contracts that may be required for the services of experts, the definition of a detailed project schedule consistent with the high-level project timeline and continued project management control to adhere to the detailed schedule within the cost constraints of the contract. This also includes regular project management reporting, maintaining an Action Item log, and conducting all reviews and meetings.

### ***4.2.2 Configuration Management***

The contractor shall produce a Software Configuration Management Plan and report regularly on its implementation. This is to ensure that all simulated data and assessment are sufficiently documented to permit repeatability, including verbal descriptions of all inputs, outputs, and software subroutines used, and that all simulation and assessment documentation and all software newly developed for this contract are included in the software EIDP.

### ***4.2.3 Travel***

The contract shall support travel of the contract team and (as stated in Section 1.4 above) shall reimburse travel costs of other Canadian university scientists to attend contract-related meetings at CSA, as well as SIT meetings, SCC meetings and A-CCP workshops in the USA. The estimated travel is shown in [Table 8] although the contractor may propose different estimated travel.

**TABLE 8 ESTIMATED TRAVEL**

Heading	Persons	Destination	Trips	Comments
NASA A-CCP study team meetings	5	US	2	SIT & SCC
NASA A-CCP workshops	5	US	2	
CSA project meetings	5	St. Hubert	2	
Canadian science workshops and conferences	5	Canada	2	e.g. CMOS, Canadian Atmospheric Science Community Workshop

### 4.3 WP2: ALI SIMULATION AND SUPPORT

#### 4.3.1 *Level 0-2 Simulator*

The contractor shall develop an end-to-end ALI measurement simulator to support science assessments, requirement validation and retrieval development. Upon completion of this work, the simulator must be capable of generating realistic atmospheric input scenes, account for the current state of the design of the optical instrument (e.g. sensitivity, spatial point-spread function, spectral bandpass, instantaneous field of view, straylight) and generate synthetic Level 0 data. The simulator must then account for relevant satellite orbital and viewing geometry configurations, and calibration approaches to generate synthetic Level 1 data including measurement covariances. Finally, the simulator must implement retrieval algorithms for relevant atmospheric data products to generate Level 2 data, including retrieval covariances. The overall purpose is to provide a tool to connect the instrument specifications to the achievable data products, demonstrate their science value, and refine the retrieval algorithms. If the retrieval algorithms for a relevant data product are not sufficiently advanced for implementation, this work package must include the development of the algorithms.

#### 4.3.2 *Instrument Refinement*

The contractor shall utilize the results of the simulator development to provide recommendations to the Canadian Space Agency on design refinements and improvements for the ALI instrument. The contractor should also identify critical technological developments or tests on subcomponents with elements of risk that could compromise the data products.

#### 4.3.3 *NASA A-CCP Study Support*

The contractor shall support the NASA mission selection study by participating in relevant NASA-led SIT-A, SIT-C and SCC teleconferences, attending relevant NASA workshops, and by providing the scientific and technical information on ALI as required by NASA to complete the mission selection study. This may require results from the Level 0-2 simulator for specific cases requested by NASA and interfacing with the Canadian Space Agency and/or industrial representatives to obtain or confirm technical information on TICFIRE. Any specific documentation required by NASA on the ALI instrument must be developed and submitted within this work package.

## **4.4 WP3: SHOW SIMULATION AND SUPPORT**

### ***4.4.1 Level 0-2 Simulator***

The contractor shall develop an end-to-end SHOW measurement simulator to support science assessments, requirement validation and retrieval development. Upon completion of this work, the simulator must be capable of generating realistic atmospheric input scenes, account for the current state of the design of the optical instrument (e.g. sensitivity, spatial point-spread function, spectral bandpass, instantaneous field of view, straylight) and generate synthetic Level 0 data. The simulator must then account for relevant satellite orbital and viewing geometry configurations, and calibration approaches to generate synthetic Level 1 data including measurement covariances. Finally, the simulator must implement retrieval algorithms for relevant atmospheric data products to generate Level 2 data, including retrieval covariances. The overall purpose is to provide a tool to connect the instrument specifications to the achievable data products, demonstrate their science value, and refine the retrieval algorithms. If the retrieval algorithms for a relevant data product are not sufficiently advanced for implementation, this work package must include the development of the algorithms.

### ***4.4.2 Instrument Refinement***

The contractor shall utilize the results of the simulator development to provide recommendations to the Canadian Space Agency on design refinements and improvements for the SHOW instrument. The contractor should also identify critical technological developments or tests on subcomponents with elements of risk that could compromise the data products. For the SHOW instrument, this should include a review of the spatial heterodyne interferometer optical and thermal design to optimize the measurements for water vapor levels in the upper troposphere up to 100 ppm.

### ***4.4.3 NASA A-CCP Study Support***

The contractor shall support the NASA mission selection study by participating in relevant NASA-led SIT-A, SIT-C and SCC teleconferences, attending relevant NASA workshops, and by providing the scientific and technical information on SHOW as required by NASA to complete the mission selection study. This may require results from the Level 0-2 simulator for specific cases requested by NASA and interfacing with the Canadian Space Agency and/or industrial representatives to obtain or confirm technical information on TICFIRE. Any specific documentation required by NASA on the SHOW instrument must be developed and submitted within this work package.

## **4.5 WP4: TICFIRE SIMULATION AND SUPPORT**

### ***4.5.1 Level 0-2 Simulator***

The contractor shall develop an end-to-end TICFIRE measurement simulator to support science assessments, requirement validation and retrieval development. Upon completion of this work, the simulator must be capable of generating realistic atmospheric input scenes, account for the current state of the design of the optical instrument (e.g. sensitivity, spatial point-spread function, spectral bandpass, instantaneous field of view, straylight) and generate synthetic Level 0 data. The simulator must then account for relevant satellite orbital and viewing geometry configurations, and calibration approaches to generate synthetic Level 1 data including measurement covariances.

Finally, the simulator must implement retrieval algorithms for relevant atmospheric data products to generate Level 2 data, including retrieval covariances. The overall purpose is to provide a tool to connect the instrument specifications to the achievable data products, demonstrate their science value, and refine the retrieval algorithms. If the retrieval algorithms for a relevant data product are not sufficiently advanced for implementation, this work package must include the development of the algorithms.

#### ***4.5.2 Instrument Refinement***

The contractor shall utilize the results of the simulator development to provide recommendations to the Canadian Space Agency on design refinements and improvements for the TICFIRE instrument. The contractor should also identify critical technological developments or tests on subcomponents with elements of risk that could compromise the data products.

#### ***4.5.3 NASA A-CCP Study Support***

The contractor shall support the NASA mission selection study by participating in relevant NASA-led SIT-A, SIT-C and SCC teleconferences, attending relevant NASA workshops, and by providing the scientific and technical information on TICFIRE as required by NASA to complete the mission selection study. This may require results from the Level 0-2 simulator for specific cases requested by NASA and interfacing with the Canadian Space Agency and/or industrial representatives to obtain or confirm technical information on TICFIRE. Any specific documentation required by NASA on the TICFIRE instrument must be developed and submitted within this work package.

### **4.6 WP5: DATA PRODUCT SIMULATIONS AND SCIENTIFIC ASSESSMENTS**

This work package shall provide an assessment of the scientific performance of the Canadian instruments on a set of realistic measurement scenarios generated by a high resolution numerical weather prediction model (or similar). These model frames may be generated by NASA as part of the boarder A-CCP study, or they may be generated by a Canadian model such as the Global Environmental Multiscale (GEM) model. Collaboration with Environment and Climate Change Canada experts is envisioned. The model frames should be used to generate synthetic radiances to be used as test cases for the measurement simulator, and an assessment generated with the goal to show (1) that the Canadian instruments can measure the intended quantities when provided data from realistic scenes, and (2) that when combined with the other ACCP instruments the Canadian instruments provide data that the baseline instruments are either missing and/or are measuring less accurately. The synergy of the TICFIRE, ALI, and SHOW observations will provide substantial overlap in thin clouds, haze, and water vapor, with the ultimate goal to address the 3D interactions between aerosol, clouds and precipitation, and supporting assessment of the total atmospheric water balance.

### **4.7 WP6: PROMOTE AWARENESS OF A-CCP & THE CANADIAN INSTRUMENTS**

The contractor should participate in workshops and conferences within Canada and internationally to promote awareness of the A-CCP NASA mission and the three Canadian instruments—ALI, SHOW, and TICFIRE. The contractor should also engage the executive and governance committees of the participating universities to promote co-funding initiatives in the development of these three instruments.

## **5 CONTRACT DELIVERABLES**

### **5.1 SOFTWARE**

The Contractor, in consultation with the TA, shall define the best way to maintain and store all software defined in section 3.2.7.

### **5.2 DOCUMENTATION**

The Contractor shall deliver all documentation requested in Appendix A.

The Contractor Shall interface with the TA to assure all documents in the CDRL to be released and depository according to CSA CADM instruction (DID 100) or using agreed format and tailored DIDs.

The Contractor may propose to combine documents called by more than one CDRL into one document, but this is subject to prior approval from the CSA. Where this approval is granted, the document cover page must list all the CDRL numbers that are covered by this document.

Documentation, reporting and other deliverables must be according to instructions provided in Appendix B of this SOW, which also provides naming convention. Presentation material should be in PowerPoint format. Documents provided in Adobe PDF format must not be protected against copy of text and figures.

Documents must be delivered in the original software application format. One electronic copy of each deliverable document must be transferred to the CSA to the address and in the format specified in DID-100. No paper copy is to be delivered.

All simulation scenarios that have been considered (e.g. with STK) must be delivered in CD-ROM or DVD-ROM format.

All documents must be provided 10 working days prior to the specified Review/Meeting unless otherwise indicated.

## **6 SCHEDULE**

The contractor shall provide a schedule as part of their technical proposal, describing the sequence and duration of work packages, expected achievements or indicators of progress in performing the work packages, progress review meetings, and deliverables.

## 7 ACRONYMS AND ABBREVIATIONS

This list contains the acronyms and abbreviations contained in this document. Those not contained in this list may be categorised as trademark or standard names used in the software industry

A-CCP	Aerosols – Clouds, Convection, Precipitation
AIT	Applications Impact Team
ALI	Aerosol Limb Imager
AR	As Required
ASAC	CSA Atmospheric Science Advisory Committee
CDRL	Contract Data Requirements List
CF	Contractor Format
CSA	Canadian Space Agency
ECCC	Environment and Climate Change Canada
EIDP	End Item Data Package
OSSEs	Observational System Simulation Experiments
RFP	Request for Proposal
SALT	Science and Applications Leadership Team
SATM	Science and Applications Traceability Matrix
SCC	Science Community Committee
SIT	Science Impact Teams
SIT-A	SIT - Aerosols
SIT-C	SIT – Clouds, Convection, Precipitation
SHOW	Spatial Heterodyne Observations of Water
SOW	Statement of Work
TA	CSA Technical Authority
TBC	To Be Confirmed
TICFIRE	Thin Ice Clouds Far InfraRed Experiment
TL	Time Line milestone

## **APPENDICES**



## **A CONTRACT DATA REQUIREMENTS LIST (CDRL)**

This Appendix defines the documentation to be delivered by the Contractor.

### **LEGEND:**

#### **1) DID No.**

- CF = Contractor's format

#### **2) Document Versions:**

- D: Draft (under Version Control, expected to be updated – up to 50% complete and correct)
- P: Preliminary (under Version Control, expected to be updated - 70% complete and correct).
- IR: Initial Release (under Configuration Control, may well be revised during normal project life - 95-100% complete & correct).
- U: Update (expected revision, but not final; under Configuration Control, previous versions remain unchanged under Configuration Control).
- F: Final (under Configuration Control, normally not expected to be revised, but could be if necessary - 100% complete and correct).

TABLE A-1 – CDRL

CDRL No.	Title	SOW Sect. No.	DID No.	Initial Release	Update	Final	Acceptance Category
<b>A.0 PROJECT MANAGEMENT</b>							
PM100	<a href="#">Progress Report</a>	3.2.4	DID-107	CA + 1 Month	Monthly		INFO
PM101	<a href="#">Kick-Off Meeting Presentation</a>	3.2.6	DID-108	Kick-off meeting	N/A		INFO
PM102	<a href="#">Meeting Agenda</a>	3.2.6	DID-110		AR		INFO
PM103	<a href="#">Minutes of Meetings</a>	3.2.6	DID-111		AR		INFO
PM104	<a href="#">Action Items Log (AIL)</a>	3.2.5	DID-112		AR		INFO
PM105	<a href="#">Phase Closure / Final Report</a>		DID-114			Final Review	INFO
PM106	<a href="#">Executive Report</a>		CF			Final Review	INFO
PM107							
<b>A.1 SAFETY AND MISSION ASSURANCE (S&amp;MA)</b>							
SMA 300	<a href="#">Software Configuration Management Plan</a>	3.2.7	DID-323	RFP	CA + 1 Month		Approval
SMA 380	<a href="#">Software EIDP</a>	3.2.7	DID-381				Approval
SMA 381							
<b>A.2 ENGINEERING</b>							
	<a href="#">Requirements &amp; Specification</a>						
EN400	<a href="#">Software VDD</a>	3.2.7	DID-713			Final Review	Approval
EN401							

CDRL No.	Title	SOW Sect. No.	DID No.	Initial Release	Update	Final	Acceptance Category
<b>A.3 OPERATIONS</b>							
	<a href="#"><u>Operations Requirements</u></a>						
OP800	<a href="#"><u>Software User's Manual</u></a>	3.2.7	CF			Final Review	Info
OP801							

## **B DATA ITEMS DESCRIPTIONS (DIDS)**

<b>DID-100 – GENERAL PREPARATION INSTRUCTIONS .....</b>	<b>23</b>
<b>DID-107 – PROGRESS REPORT.....</b>	<b>30</b>
<b>DID-108 – KICK-OFF MEETING PRESENTATION .....</b>	<b>33</b>
<b>DID-110 – MEETING AGENDA.....</b>	<b>34</b>
<b>DID-111 – MINUTES OF MEETINGS .....</b>	<b>35</b>
<b>DID-112 – ACTION ITEMS LOG (AIL).....</b>	<b>36</b>
<b>DID-114 – PHASE CLOSURE/ FINAL REPORT .....</b>	<b>37</b>
<b>DID-323 – SOFTWARE CONFIGURATION MANAGEMENT PLAN .....</b>	<b>38</b>
<b>DID-381 – SOFTWARE END ITEM DATA PACKAGE .....</b>	<b>40</b>
<b>DID-710 – SOFTWARE VERSION DESCRIPTION DOCUMENT (VDD).....</b>	<b>41</b>
<b>DID-713 – SIMULATOR VERSION DESCRIPTION DOCUMENT (VDD) .....</b>	<b>43</b>

---

## DATA ITEM DESCRIPTION

---

### DID-100 – General Preparation Instructions

DID Issue: IR

Date: 2013-12-19

---

#### PURPOSE:

This DID specifies:

- a) format requirements for the preparation and formatting of deliverable project documentation;
- b) document and data delivery methods, notifications and identification requirements;
- c) document and data structure requirements;
- d) metadata requirements for all document and data submissions.

When documentation is prepared in the Contractor's format, it must still meet the requirements of this DID.

---

#### PREPARATION INSTRUCTIONS:

##### 1. GENERAL INSTRUCTIONS

###### 1.1. PREPARATION

All documentation shall be written in English and must be delivered in electronic format. Documents must be prepared using the most appropriate software (Microsoft Word, Excel, etc.). Schedules must be submitted in Microsoft Project format. Documents whose native format is not a common office program must be delivered in PDF in addition to the native format.

The electronic file name and the identification number written on the document itself must have the following format:

WXYZ-CDRL-NUM-CIE\_ContractNumber\_sentYYYY-MM-DD

where:

WXYZ: A 4-8 letter acronym of the project

CDRL-NUM: The CDRL Identifier

CIE: Name of the Company (no space, no hyphen)

ContractNumber: For example: \_9F028-07-4200-03

\_sentYEAR-MONTH-DAY: Date Tracking Number

###### 1.2. ELECTRONIC DOCUMENTS FORMAT

Electronic copies of text documents must be formatted for printing on 8.5" x 11" paper.

---

### *1.1.1 Page Numbering*

General format of documents should include page numbers and be formatted according to the contractor's normal standard. If the document is divided into volumes, each such volume must restart the page numbering sequence.

### *1.1.2 Document Numbers*

All pages must contain the Document Number at the top of the page. Document Numbers must include revision status and volume identification as applicable.

## **1.3. DELIVERY, NOTIFICATIONS AND IDENTIFICATION REQUIREMENTS**

Data must be submitted with a Letter of Transmittal (or an electronic equivalent as mutually agreed by the CSA and the Contractor), and acknowledged. The Letter of Transmittal must be forwarded by the Contractor in two copies; one copy of acknowledgement to be signed and returned to the Contractor by the recipient. The Letter of Transmittal will contain as a minimum, the Contract Serial Number, the CDRL Number and the Title.

Documents may be delivered via e-mail or direct transfer (FTP) or on DVD or CD-ROM disk.

### *1.1.3 E-mailed documents*

E-mailed documents must be sent to:

[CM\\_Receipt@space.gc.ca](mailto:CM_Receipt@space.gc.ca)

Covering e-mails must contain the project/program acronym or equivalent identifier in the "Subject" line and include the CDRL identifier under which deliverable documents are being submitted.

### *1.1.4 Direct Transferred Documents*

For direct transfer, a notification of the document's availability and location on a contractor repository must be sent to:

[CM\\_Receipt@space.gc.ca](mailto:CM_Receipt@space.gc.ca)

If deliverables contain ITAR content, notifications of their availability on contractor repositories shall be sent to: the CSA CM ITAR Receipt Desk:

[CSA-CM-ITAR@asc-csa.gc.ca](mailto:CSA-CM-ITAR@asc-csa.gc.ca)

The notification must include the project/program acronym or equivalent identifier and the CDRL identifier under which deliverable documents are being submitted.

### *1.1.5 Documents Delivered on DVD or CD-ROM disk*

Hard copy and media deliverables are to be addressed to:

CM Library, 6A-100  
Attention: CSA A-CCP Project  
Canadian Space Agency  
6767, Route de l'Aéroport  
Longueuil, QC, J3Y 8Y9  
CANADA

The DVD or CD-ROM label must show the following information:

- a) Company Name
- b) Document Title
- c) Document Number and Revision Status
- d) CSA SOW Number
- e) CDRL Number and Title
- f) Contract Number

## **2. DOCUMENT STRUCTURE AND CONTENT**

Except as otherwise specified, all documents must have the overall structure as follows:

- g) Cover/Title Page;
- h) Table of Contents;
- i) Introduction;
- j) Applicable and Reference Documents;
- k) Body of Document; and
- l) Appendices

### **2.2 COVER/TITLE PAGE**

The title page must contain the following information:

- m) Document Number and date: Volume x of y (if multivolume)
- n) Rev. indicator / date of Rev.
- o) Document Title
- p) Project Name
- q) Contract No.
- r) CDRL Item No. or Nos., if one document responds to more than one CDRL, subject to prior approval from the PA.
- s) Prepared for: Canadian Space Agency
- t) Prepared by: Contractor name, CAGE Code, address, and phone number
- u) Product tree identifier, if applicable
- v) © HER MAJESTY THE QUEEN IN RIGHT OF CANADA [YEAR].

### **2.3 TABLE OF CONTENTS**

The table of contents must list the title and page number of each titled paragraph and subparagraph, at least down to the third level inclusive. The table of contents must then list the title and page number of each appendix, figure and table, in that order.

## **2.4 INTRODUCTION**

This section must be identified as section 1 and must, as a minimum, provide the following information:

- w) Project description and background;
- x) Identification (number, title) and a brief overview of the system, hardware, or software to which the document applies;
- y) Purpose of the document;
- z) Scope of the document (what it includes and what it does not include);
- aa) Document conventions; and
- bb) Roles and responsibilities of the participants and stakeholders.

The requirements specified in the following DIDs are the minimum expected. The Contractor must include in all documents all additional information required in order to ensure that the document provided will achieve its purpose as stated in the DID.

## **2.5 APPLICABLE AND REFERENCE DOCUMENTS**

This section must list by Document Number and title, all applicable and reference documents. This section must also identify the source of all applicable and reference documents and the revision indicator.

## **2.6 BODY OF DOCUMENT**

The body of the document must be prepared in accordance with the content and format requirements defined in the specific Data Item Description.

## **2.7 APPENDICES**

Appendices may be used to provide information published separately for convenience of document maintenance. Acronyms must be in the last appendix.

## **3. METADATA ON DELIVERABLES**

*This section is optional at the discretion of the CSA Project Manager.*

In order for CSA to be able to properly manage deliverables and the system configuration as well as to process contractor's deliverables in an efficient manner, the contractor must, for each deliverable, provide metadata as described in the following table.



Provided by Supplier	Metadata Description	Comments
Yes	CSA Project Identifier	Project Acronym
Yes	Contract Identifier	PWGSC identifier
Yes	Contract Revision Identifier	PWGSC identifier
Optional	Contract Revision Date	
Yes	SOW Identifier	CSA Doc ID
Yes	SOW Revision Identifier	CSA Doc Revision ID
Yes	Document Type	Dwg, Doc, RFD, RFW, ECR, ECN, IP CR, IP CN/CD, QN, etc.
Yes	CDRL Identifier	Per CSA SOW (e.g. EN-006)
Yes	CDRL Sub-category Identifier	If multiple, separate subject documents per CDRL item (e.g. EN-006.03) (can be contractor defined)
Optional	Project WBS identifier	
Optional	SOW paragraph identifier.	
Optional	DID/DRD Identifier	
Yes	Deliverable submission format	Electronic, Hard copy, On media (CD-ROM, etc.)
Yes	Deliverable Transmittal Identifier	e.g. CADM09-0123. Can also be a notification of delivery identifier
Yes	Deliverable Transmittal Date	
Yes	Originator's Organization Identifier	CAGE code, company name, short name, etc.
Optional	Document Author	
Yes	Deliverable Type	Dwg, Doc, RFD, RFW, ECR, ECN, NCR, Problem Report, IP CR, IP CN/CD, QN, etc.
Yes	Document Type	Specification, Design, Plan, Tech Note, Report, etc.
Yes	Originator's Document Identifier	
When applicable	Originator's Document Volume Identifier	
When applicable	Originator's Document Part Identifier	

Provided by Supplier	Metadata Description	Comments
When applicable	Originator's Document Issue Identifier	When both Issue and Revision are used concurrently to identify released documents
Yes	Originator's Document Revision Identifier	
Yes	Originator's Document Title	
Yes	Document Release Date	
Yes	Document Effective Date	Applicable to document changes, deviations, waivers,
Yes	Document Expiry Date	If applicable
When applicable	Originator's Authorizing ECN Identifier	Class 2 ECN approving document release and submission to customer
Yes	Document Maturity	Draft, Preliminary, Initial Release, Updated Revision, etc.
When applicable	Class	If deliverable is a change, deviation, waiver, etc. to a released item. (Class I, Class II)
Yes	Security Classification of Deliverable	Per Government of Canada definitions for Classified and Protected data (C,S,TS,PA,PB,PC)
Yes	Sensitivity of Document contents	Company Proprietary, Trade Secret, etc.
Yes	ITAR Content Indicator	Yes or No
Yes	Export Controlled Content Indicator	Yes or No
Yes	Affected Document Identifier	If deliverable is a change, deviation, waiver, etc. to a released document/drawing/model. Enables change-to-document, waiver-to-document relationships, etc.
Yes	Affected Document Revision Identifier	As above
Yes	Affected Document Title	As above
Yes	Product Breakdown Structure / Item Hierarchy Identifier	Critical for Item-to-Document Relationship

Provided by Supplier	Metadata Description	Comments
Yes	Associated Project/System Milestone Review	PDR, CDR, etc. When Reviews are at sub-system level, identify accordingly. e.g. Bus PDR
When applicable	Associated System Baseline	If different from Project Milestone
Yes	Filename of Deliverable	Filename and file type (for all representations submitted - .doc, .pdf, etc.). Original, revisable format to be delivered before contract completion.
Yes	Format of Deliverable / Application used to produce	MS WORD 2007, Project Scheduler 9, etc.
When applicable	Filename of Parent Deliverable Bundle	If part of a document Bill of Material
When applicable	Identification of Delivery Media	If physically delivered
When applicable	Originator's Repository Address of deliverable	To identify source location of document

---

## DATA ITEM DESCRIPTION

---

### DID-107 – Progress Report

DID Issue: IR

Date: 2014-01-10

---

#### PURPOSE:

The Progress Report presents the results of the work done to date in the contract, and in particular since the previous report. The Progress Report is used by the Government to assess the Contractor's progress in performance of the work.

---

#### PREPARATION INSTRUCTIONS:

*NOTE TO CSA PROJECT MANAGERS: The content required below includes all the information required for a large project. For smaller or Phase 0 or A projects, the CSA Project Manager may elect to tailor these requirements down to a suitable level, however, it is necessary to ensure that enough information is obtained to maintain control of the project.*

The Monthly Progress Report shall include status data and information summarizing project management, technical and schedule progress and accomplishment for each element of the Contractor's Work Breakdown Structure (CWBS). The report shall address the major activities of the reporting period and shall emphasize major achievements and events of special significance. Difficulties and/or problems that have affected the work progress, proposed corrective actions, project impact expected and concerns for the future, shall also be reported.

Each progress report shall answer the following three questions:

- 2) Is the project on schedule?
- 3) Is the project within budget?
- 4) Is the project free of any areas of concern in which the assistance or guidance of the CSA may be required?

Each negative response must be supported with an explanation.

The Progress Report must include the following information, as a minimum:

- 5) Summary outlook, including technical performance, work performed, schedule and cost status (at CWBS level 2), organization and key personnel changes and areas of concerns;
- 6) Financial status including actual and forecasted expenditures, by month, as compared to the original monthly planned expenditure profile;
- 7) *For cost reimbursable contracts:* Cost performance status in tabular form, with the following information provided for each Work Package (WP):
  - a) Budgeted Cost of Work Scheduled (BCWS), current and cumulative,
  - b) Budgeted Cost of Work Performed (BCWP), current and cumulative,

- c) Actual Cost of Work Performed (ACWP), current and cumulative,
  - d) Cost variance (current and cumulative),
  - e) Budget at completion (BAC),
  - f) Estimate at completion (EAC),
  - g) Cost variance at completion, and
  - h) Cost Performance Index (CPI);
- 8) *For fixed price contracts:* Updated milestones payment plan;
- 9) A detailed integrated project schedule status including:
- a) The schedule baseline,
  - b) Dependencies between activities,
  - c) Percent of completion for all activities,
  - d) List of completed milestones,
  - e) Critical path,
  - f) 1st level subcontractor's activities having impact on WP delivery date shall be provided, and
  - g) All other activities having an impact on WP delivery date shall be provided;
- 10) Schedule variances from the plan, including deviations from schedule and proposed corrective actions for significant variances;
- 11) Major meetings schedule update;
- 12) Status of the work in progress, specifically the work performed in the previous calendar period; sufficient sketches, diagrams, photographs, etc. shall be included, if necessary, to describe the progress accomplished;
- 13) The work projected for the next period, and estimated date of completion of next milestone;
- 14) Outline of technical and programmatic issues, with solutions recommended;
- 15) Contractual issues, including changes to activities and costs;
- 16) Subcontracts events, status and issues;
- 17) Equipment ordered, received, made and assembled;
- 18) Description of trips or conferences connected with the Contract during the period of the report;
- 19) Risk status report including previous issues resolved, status of on-going risks (changes, likelihoods and impacts), and identification of new risks, their likelihood and impact, and proposed mitigation action;
- 20) PA reporting:
- a) A narrative section describing: significant accomplishments during the reporting period, audits performed, significant problems, recommended solutions, and corrective action status, significant changes in the PA Organization and Program related organizations,
  - b) Summary tables or updates as applicable:

- i) Technical review action items, configuration baseline, non-conformances, failure analysis, audits (internal as well as at the subcontractors and their sub-tiers),
  - ii) Reliability analysis status,
  - iii) Inspection and Test Status,
  - iv) Deviations/Waivers status,
  - v) List of Class I Non-conformances,
  - vi) List of Class II Non-conformances,
  - vii) PA documentation status,
  - viii) PA Action Item Log,
  - ix) Contractor problem status, and
  - x) Status of GIDEP/ESA Alerts,
- c) Software assurance highlights:
- i) Assurance accomplishments and resulting metrics for activities such as, but not limited to, inspection and test, reviews, Instrument Provider/subcontractor surveys, and audits,
  - ii) Trends in metrics data (e.g., total number of software problem reports, including the number of problem reports that were opened and closed in that reporting period),
  - iii) Significant problems or issues that could affect cost, schedule and/or performance, and
  - iv) Plans for upcoming software assurance activities; and
- 21) Status of all action items from previous review(s) and meeting(s).

## **DATA ITEM DESCRIPTION**

---

### **DID-108 – Kick-off Meeting Presentation**

**DID Issue: IR**

**Date: 2014-01-10**

---

#### **PURPOSE:**

To present the Contractor's plan for carrying out the project and to address all significant issues.

---

#### **PREPARATION INSTRUCTIONS:**

The Kick-off Meeting Presentation shall contain the following information, as a minimum:

- 1) Review of major assumptions;
- 2) Review of contract deliverables;
- 3) Work requirements, WBS status and schedule;
- 4) Project's funding and expected cash-flow;
- 5) FIP and BIP;
- 6) Licensing issues if any;
- 7) Presentation to include the required copyrights and IP disclosure;
- 8) Other items as deemed appropriate

---

## DATA ITEM DESCRIPTION

---

### DID-110 – Meeting Agenda

DID Issue: IR

Date: 2013-12-19

---

#### PURPOSE:

The Meeting Agenda specifies the purpose and content of a meeting.

---

#### PREPARATION INSTRUCTIONS:

The meeting agendas shall contain the following information, as a minimum.

##### 1. DOCUMENT HEADER:

- a) Title;
- b) Type of meeting;
- c) Project title, project number, and contract number;
- d) Date, time, and place;
- e) Chairperson; and
- f) Expected duration.

##### 2. DOCUMENT BODY:

- g) Introduction;
- h) Opening Remarks: CSA;
- i) Opening Remarks: Contractor;
- j) Review of previous minutes and all open action items;
- k) Project technical issues;
- l) Project management issues;
- m) Other topics;
- n) Review of newly created/closed action items, decisions, agreements and minutes; and
- o) Set or confirm dates of future meetings.



---

## DATA ITEM DESCRIPTION

---

### DID-111 – Minutes of Meetings

DID Issue: IR

Date: 2013-12-19

---

#### PURPOSE:

The minutes of reviews or meetings provide a record of decisions and agreements reached during reviews/meetings.

---

#### PREPARATION INSTRUCTIONS:

Minutes of meeting shall be prepared for each formal review or meeting in the Contractor's format and shall, as a minimum, include the following information:

- 1) Title page containing the following:
  - a) Title, type of meeting and date
  - b) Project title, project number, and contract number
  - c) Space for signatures of the designated representatives of the Contractor, the CSA and the Public Works and Government Services Canada (PWGSC), and
  - d) Name and address of the Contractor.
- 2) Purpose and objective of the meeting;
- 3) Location;
- 4) Agenda;
- 5) Summary of the discussions, decisions and agreements reached;
- 6) List of attendees by name, position, phone numbers and e-mail addresses as appropriate;
- 7) Listing of open action items and responsibility for each action to be implemented as a result of the review;
- 8) Other data and information as mutually agreed; and
- 9) The minutes shall include the following statement:

*"All parties involved in contractual obligations concerning the project acknowledge that minutes of a review/meeting do not modify, subtract from, or add to the obligations of the parties, as defined in the contract."*

---

## DATA ITEM DESCRIPTION

---

### DID-112 – Action Items Log (AIL)

DID Issue: IR

Date: 2013-12-19

---

#### PURPOSE:

The Action Item Log (AIL) lists, in chronological order, all items on which some action is required, allows tracking of the action, and in the end provides a permanent record of those Action Items (AI).

---

#### PREPARATION INSTRUCTIONS:

The Action Item Log (AIL) must be in a tabular form, with the following headings in this order:

- 1) Item Number;
- 2) Item Title;
- 3) Description of the action required;
- 4) Open Date;
- 5) Source of AI (e.g. PDR meeting, RID, etc.);
- 6) Originator;
- 7) Office of Prime Interest (OPI);
- 8) Person responsible (for taking action);
- 9) Target/Actual Date of Resolution;
- 10) Progress update;
- 11) Rationale for closure;
- 12) Status (Open or Closed); and
- 13) Remarks.

The date in column 9) will be the target date as long as the item is open, and the actual date once the item is closed.

---

## DATA ITEM DESCRIPTION

---

### DID-114 – Phase Closure / Final Report

DID Issue: IR

Date: 2014-01-16

---

#### PURPOSE:

The purpose of the Phase Closure/ Final Report is to record formally the history of the Phase (or Project if this is the Final Report), its achievements, financial, material and human resources expenditure, problems encountered and solutions implemented.

---

#### PREPARATION INSTRUCTIONS:

The Phase Closure / Final Report will encompass all the work done in the project during the Phase just ended or for the entire project. It should be a comprehensive summary of the phase or project work with the emphasis on the problems encountered, solutions implemented, successes encountered and lessons learned. It must include sufficient drawings, graphs, tables, figures, sketches and photographs as appropriate. The Phase Closure Report shall be a standalone document and shall contain at least the following information:

- 1) Executive Summary.
- 2) Comparison of system performance results against system requirements and objectives.
- 3) Comparison of run-out costs with estimates by major Work Package (if applicable).
- 4) Comparison of actual versus planned schedules and milestones.
- 5) Comparison of risks anticipated versus actual experience.
- 6) Problems encountered and solutions implemented.
- 7) Final CDRL.
- 8) Lessons learned.

---

## DATA ITEM DESCRIPTION

---

### DID-323 – Software Configuration Management Plan

DID Issue: IR

Date: 2014-02-25

---

#### PURPOSE:

To define the software configuration management system to be established, documented and maintained to control software work products, and the development and test environment.

---

#### PREPARATION INSTRUCTIONS:

The Software Configuration Management Plan shall include the following:

- 1) Levels of code and documentation control involved.
  - 2) The work products subject to configuration management such as but not limited to:
    - a) Software documentation including plans, requirements, architecture, designs, and user documentation;
    - b) Code;
    - c) Off-The-Shelf software;
    - d) Build procedures, tools, and scripts;
    - e) Test cases, scenarios, scripts, data, and results;
    - f) Critical records such as change requests, defect reports and action items.
  - 3) Software configuration management tasks:
    - a) Maintain a repository for code, documentation and other work products.
    - b) Provide training in use of CM tools and procedures.
    - c) Establish rules for submitting both new and revised items to the library.
    - d) Provide coordination for updating multiple products in one or more locations; differences in site-unique versions should be identified and tracked.
    - e) Identify the version of all software items that constitute a specific build or a delivered product.
    - f) Identify differences between controlled versions – both source code differences and differences in functionality between versions.
    - g) Document the software and hardware used in the development and test environment, including version and known problems; trace software products to the operating system and development tools employed, so that the development environment may be accurately recreated.
    - h) Build production software items into a linked set of modules ready for integration and test; rebuild previous development or delivered versions upon request.
-

- i) Control simultaneous updating of a software item by more than one person.
- j) Record and track all actions resulting from defect reports and change requests, for all items under configuration management, from initiation through release of the changed product.
- k) Collect and summarize metrics to help assess the state of product development.
- l) Monitor and report on the status of software items, defect reports and change requests, and the implementation of approved changes.
- m) Archive the software for each delivered product, together with its associated documentation and quality records.
- n) Execute periodic back-ups for items under CM and develop disaster recovery procedures.
- o) Identify test status of software items under configuration management. Examples of test status include untested (under development), unit test, integration test, acceptance test, defect fixing, and released.

The configuration management system should support incremental software builds and automated testing.

- 4) Identification of software work products to be placed under configuration management, and the criteria for baselining each item.
- 5) Establishment and maintenance of baselines for identified software work products.
- 6) Identification of a change control authority for all items under configuration management.
- 7) Procedure for recording, reviewing, analyzing, dispositioning, and tracking change requests and software problem/failure reports for configuration items.

**Note:**

The mechanisms for handling change requests and problem/failure reports should be integrated into the configuration management system.

- 8) Procedure for documenting and maintaining build procedures and all other required inputs in order to support recreation of the work products needed for a delivery.
- 9) Performance and documentation of internal configuration audits to be performed by the contractor to confirm the configuration baselines and associated information are accurate. CSA may request additional configuration audits if specified in the Statement of Work.

**Note:**

Configuration audits assess the integrity of baselines and verify that configuration records correctly identify the status of the configuration items. "Integrity" is the degree to which a system prevents unauthorized access to, or modification of, specified work products. A configuration audit includes review of evidence that the configuration management plan is being followed.

---

## DATA ITEM DESCRIPTION

---

### DID-381 – Software End Item Data Package

DID Issue: IR

Date: 2014-01-22

---

#### PURPOSE:

To provide the historical record and documentation of a software end item.

---

#### PREPARATION INSTRUCTIONS:

An End Item Data Package must be prepared for each deliverable software. The contents of the package must include, but not be limited to, the following information:

1. As-built product identification, including:
  - a) Identification of software release by program ID, phase, version, date, and build,
  - b) Operating system name and version,
  - c) Programming language name, compiler name, and version,
  - d) Supporting development environment name and version (if any);
2. Final VDD;
3. List of all required software related documentation (under CM control), including the software design documentation, users' manuals, test procedures, scripts and test results;
4. All software source codes, executables, configuration and parameter files, reloadable FPGA configuration files;
5. All third party software; third party software must be accompanied by a license that allows the software to be archived and copied as necessary for all future CSA operations;
6. A list of all COTS software and computers purchased under this contract;
7. All COTS software purchased under this contract (original disk or file with license to CSA), Ground Support Equipment (GSE) software etc.; and
8. A list of all open/closed anomalies or liens against this delivery. All flagged or major anomalies should be closed prior to the delivery.

All software must be delivered on media that is directly compatible with the delivered hardware. One set of software must be installed on the delivered hardware. A second set must be supplied on a CD-ROM or DVD disk.

---

## DATA ITEM DESCRIPTION

---

### DID-710 – Software Version Description Document (VDD)

DID Issue: IR

Date: 2014-02-25

---

#### PURPOSE:

To identify the contents of a software CSCI release and to record the details of all aspects of the system, support software and hardware required to regenerate this CSCI.

---

#### PREPARATION INSTRUCTIONS:

This document shall follow the J-STD-016 DID for a software Version Description Document. This document shall identify the software modules that make up the system or segment software. Changes from the previous version (if any) shall be documented along with any known deficiencies that affect the operation of the current version.

The VDD shall contain the following information, as a minimum:

- 1) Introduction:
  - a) Identification;
  - b) System Overview.
- 2) Applicable and Reference Documents.
- 3) Version Description:
  - a) Inventory of Materials Released:
    - v) Materials;
    - vi) Hardware Tools;
    - vii) Development Platform Hardware Requirements;
    - viii) Software Tools;
    - ix) CSCI Source File Listing;
    - x) Documentation; this section must list all relevant documents revisions associated with this build version (requirements, ICDs,...).
  - b) Inventory of Software Content.
  - c) Changes Incorporated. This section must list all new functionalities that were added, and/or all problems that were corrected in this version. A list of all modified and created files with the rationale must be included.
  - d) Build Procedures and Development Environment Setup Information. The procedure must provide step-by-step actions with screen shots as appropriate to document the complete build process.

- e) Installation Instructions.
  - f) Validation Test Scripts, Data and Results.
- 4) Known Errors and Possible Problems.
  - 5) Notes



---

## DATA ITEM DESCRIPTION

---

### DID-713 – Simulator Version Description Document (VDD)

DID Issue: IR

Date: 2014-02-25

---

#### PURPOSE:

To identify the contents of a Simulator release and to record the details of all aspects of the system, support software and hardware required to regenerate this Simulator.

---

#### PREPARATION INSTRUCTIONS:

This document shall follow the J-STD-016 DID for a software Version Description Document. This document shall identify the software modules that make up the system or segment software. Changes from the previous version (if any) shall be documented along with any known deficiencies that affect the operation of the current version.

The VDD shall contain the following information, as a minimum:

- 1) Introduction:
  - a) Identification;
  - b) System Overview.
- 2) Applicable and Reference Documents.
- 3) Version Description:
  - a) Inventory of Materials Released:
    - xi) Materials;
    - xii) Hardware Tools;
    - xiii) Development Platform Hardware Requirements;
    - xiv) Software Tools;
    - xv) CSCI Source File Listing;
    - xvi) Documentation; this section must list all relevant documents revisions associated with this build version (requirements, ICDs,...).
  - b) Inventory of Software Content.
  - c) Changes Incorporated. This section must list all new functionalities that were added, and/or all problems that were corrected in this version. A list of all modified and created files with the rationale must be included.
  - d) Build Procedures and Development Environment Setup Information. The procedure must provide step-by-step actions with screen shots as appropriate to document the complete build process.

- e) Installation Instructions.
- f) Validation Test Scripts, Data and Results.
- 4) Known Errors and Possible Problems.
- 5) Notes