

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Travaux publics et Services gouvernementaux
Canada
Place Bonaventure, portail Sud-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6
FAX pour soumissions: (514) 496-3822

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

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

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

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

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

Comments - Commentaires

| | | |
|--|--|--|
| Title - Sujet EXCORE SMALL PLANETARY ROVER PLATFO | | |
| Solicitation No. - N° de l'invitation 9F052-140062/A | | Date 2014-07-29 |
| Client Reference No. - N° de référence du client 9F052-14-0062 | | |
| GETS Reference No. - N° de référence de SEAG PW-\$MTB-690-12835 | | |
| File No. - N° de dossier MTB-4-37072 (690) | CCC No./N° CCC - FMS No./N° VME | |
| Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2014-09-04 | | Time Zone Fuseau horaire Heure Avancée de l'Est HAE |
| F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/> | | |
| Address Enquiries to: - Adresser toutes questions à: Paquin, Esther | | Buyer Id - Id de l'acheteur mtb690 |
| Telephone No. - N° de téléphone (514) 496-3889 () | | FAX No. - N° de FAX (514) 496-3822 |
| Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: AGENCE SPATIALE CANADIENNE 6767 ROUTE DE L AEROPORT Exploration Spatiale ST HUBERT Québec J3Y8Y9 Canada | | |

Instructions: See Herein

Instructions: Voir aux présentes

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-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6

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


| <div>  <div>Public Works and Government Services Canada</div> </div> | | Travaux publics et Services gouvernementaux Canada | | N° du document9F052-140062/A | | Part - Partie 1 of - de 2 See Part 2 for Clauses and Conditions Voir Partie 2 pour Clauses et Conditions | | | |
|---|---|---|-----------------------|------------------------------|----------------------|--|--------------|---------------------------------|------------------------------|
| Item Article | Description | Dest. Code Dest. | Inv. Code Fact. | Qty Qté | U. of I. U. de D. | Unit Price/Prix unitaire FOB/FAM Destination Plant/Usine | | Delivery Req. Livraison Req. | Del. Offered Liv. offerte |
| 1 | EXCORE SMALL PLANETARY ROVER PLATF ORM | 9F052 | 9F052 | 1 | LOT | \$ | XXXXXXXXXXXX | . | |

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PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation is divided into seven parts plus 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: includes the certifications to be provided;
- Part 6 Financial Requirement: includes specific requirement that must be addressed by bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting Contract.

The Annexes include the Statement of Work, Requirements Document (RD), the Basis of Payment, Technical and Managerial Bid Preparation Instructions and Point Rated Evaluation Criteria

| | |
|-----------|---|
| Annex "A" | Statement of Work, Requirements Document (RD) |
| Annex "B" | Basis of Payment |
| Annex "C" | Technical and Managerial Bid Preparation Instructions |
| Annex "D" | Point Rated Evaluation Criteria |

2. Summary

2.1 Project Title

Small Planetary Rover Platform (SPRP)

2.2 Description

With this Request for Proposals (RFP), Public Works and Government Services Canada (PWGSC) plans to award one (1) contract through the Canadian Space Agency's (CSA's) Exploration Core (ExCore) plans to deliver a functional Small Planetary Rover Platform. The scope of the actual contract encompasses the design, development, production, assembly, testing and delivery of one prototype of SPRP (Small Planetary Rover Platform). The prototype will be tested to demonstrate that it meets TRL 4 (Technology Readiness Level) level criteria. The main characteristics of this platform are: Small footprint, low cost, low mass and rugged. The Small Planetary Rover Platform targeted architecture exhibits the following features: Four wheels, skid-steering platform, fully passive suspension, manually

lockable, basic power system and Power & mechanical interface to accomodate small ESM (Exploration Surface Mobility) Payloads.

2.3 Period of Contract

The contract will be from December 1st, 2014 to December 1st, 2015.

2.4 Actual Available Budget

The budget available for the contract resulting from this bid solicitation is \$600,000.00, all applicable taxes extra. Annex A (Statement of Work and Requirements Documents) includes a description of the work required. The maximum amount of funding available for the contract will not exceed \$600,000.00, (Applicable Taxes extra, as appropriate). Bids valued in excess of this amount will be considered non-responsive. This disclosure does not commit Canada to pay the maximum funding available.

2.5 Security Requirements

No security requirements apply to this project.

This requirement is not subject to the trade agreements.

2.6 Canadian Content

The requirement is limited to Canadian goods and services.

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

4 Communications

As a courtesy and in order to coordinate any public announcements pertaining to this contract, the Government of Canada requests that successful Bidders notify the Contracting Authority 5 days in advance of their intention to make public an announcement related to the recommendation of a contract award, or any information related to the contract. The Government of Canada retains the right to make primary contract announcements.

5 Conflict of Interest

The Work described herein and the deliverable items under any resulting Contract specifically exclude the development of any statement of work, evaluation criteria or any document related to a bid solicitation. The Contractor, its subcontractor(s) or any of their agent(s) directly or indirectly involved in the performance of the Work and/or in the production of the deliverables under any resulting Contract will not be precluded from bidding on any potential future bid solicitation related to the production or exploitation of any concept or prototype developed or delivered under any resulting Contract.

PART 2 - BIDDER INSTRUCTIONS

1 Standard Instructions, Clauses and Conditions

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

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 (2014-03-01) 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: sixty (60) days

Insert: two hundred and forty (240) days

1.1 SACC Manual Clauses

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

2 Submission of Bids

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

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

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 FPS, 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 FPS 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.

4 Communications-Solicitation Period

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 questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

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.

6 Maximum Funding

The maximum available funding, applicable taxes extra, as appropriate, for the contract for the purposes of this bid solicitation is indicated under the heading Actual Available Budget in Part 1, Section 2.4 - Summary. Bids valued in excess of this amount will be considered non-responsive, pursuant to Part 4-Evaluation Procedures and Basis of Selection, Section 1.2 - Financial Evaluation. This disclosure does not commit Canada to pay the maximum funding available.

PART 3 - BID PREPARATION INSTRUCTIONS

1 Bid Preparation Instructions

Canada requests that bidders follow the format instructions described below in the preparation of each bid:

- (a) Each bid must contain the following sections:

Section I: Technical Bid as well as the Executive Summary (stand-alone document): **one (1) paper copy and two (2) electronic copies on CD.**

Section II: Financial Bid **one (1) paper copy and one (1) electronic copy on CD**

Section III: Certifications **one (1) paper copy**

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

- (b) For the paper copies, each section must be bound separately;
- (c) If there is a discrepancy between the wording of the electronic copy and the paper copy, the wording of the paper copy will have priority over the wording of the electronic copy;
- (d) For the electronic copies of Section I (Technical bid as well as the Executive Summary), all of the information must be contained in one file. The only acceptable formats are: MS Word, and PDF;
- (e) For the electronic copy of Section II (Financial Bid), all of the information must be contained in one file. The only acceptable formats are: MS Word and PDF;
- (f) The electronic copy of Section II must be submitted on a separate CD than the electronic copy submitted for Section I;
- (g) Prices must appear in Section II (financial bid) only. No prices must be indicated in any other section of the bid;
- (h) The total number of pages for Section I should not exceed 75 pages (8.5 X 11 inches) (216 mm X 279 mm) paper excluding bid appendices;
- (i) The bid should use a numbering system that corresponds to the bid solicitation;
- (j) the Bidder should ensure that the cover page in their bid (Section I, II and III) includes the following table duly filled out:

| | |
|-------------------------------|--|
| Company Name | Company address |
| Project Title | Title of the Request of Proposal: Small Planetary Platform (SPRP) |
| Project summary: (8 lines) | |

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

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

Section I: Technical Bid and Executive Summary

In their technical bid and executive summary, bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid and executive summary 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.

Part 4 - Evaluation Procedures and Basis of Selection contains additional instructions as well as Annex C entitled "Technical and Managerial Bid Preparation Instructions" that contains furthermore the structure and content that bidders should take into account when preparing their technical bids.

Section II: Financial Bid

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

- (a) A firm, all inclusive lot price for the Work, not exceeding the maximum funding available, as indicated under the heading Actual Available Budget in PART 1, Section 1.2- Summary. Applicable Taxes extra, as appropriate, must be indicated separately..
- (b) Prices in bids must be quoted in Canadian dollars. Applicable Taxes extra, as appropriate, must be indicated separately.

2 When preparing their Financial bid, bidders should review the Basis of payment in Annex B and Section 4.3, Financial Evaluation, Part 4 - Evaluation Procedures and Basis of Selection.

The prices included in the proposed pricing schedule include the estimated total cost of all items included in the price breakdown set out in Section II-1

3 For each submitted financial bid, Bidder must provide a price breakdown as follows for each firm lot price indicated, in accordance with the requirements set out in Section II- 1.

- (a) Labour: For each individual and (or) labour category to be assigned to the Work, Bidder must indicate:
 - i) the hourly rate, inclusive of overhead and profit; and
 - ii) the estimated number of hours corresponding to working hours.
- (b) Equipment: Bidder must specify each item required to purchase and complete the Work and provide the pricing basis of each one, Canadian customs duty and excise taxes included, as applicable. These items will be deliverable to Canada upon completion of the contract.
- (c) Materials and Supplies: Bidder must identify each category of materials and supplies required to purchase and provide the pricing basis of each one in order to complete the Work..
- (d) Travel and Living Expenses: Bidder must Indicate the number of trips and the number of days for each trip, 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 Office (NJC) Travel Directive. With respect to the TB Directive, only the meal, private vehicle and incidental allowances specified in Appendices B, C and D of the Directive <http://www.njc-cnm.gc.ca/directive/travel-voyage/index-eng.php>, and the other provisions of the Directive referring to "travellers", rather than those referring to "employees", are applicable.
- (e) Subcontracts: Bidder must identify all of the proposed subcontractor and provide in the Financial bid for each one a price breakdown as contained in paragraph 3 of Part 3 of the bid solicitation.
- (f) Other Direct Charges if applicable: Bidder must identify all other direct charges anticipated, such as long distance communications and rentals, and provide the pricing basis for each.
- (g) Applicable Taxes extra, as appropriate, must be identify separately.

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Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

mtb690

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

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

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Section III: Certifications

Bidders must include the certifications and the documentation related if applicable under Part.5.

Section IV Exchange Rate Fluctuation

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

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

1.1 Technical and Management Evaluation

1.1.2 Point Rated Technical and Management Criteria

Point rated Technical Evaluation Criteria are described in Annex D - Point Rated Evaluation Criteria. Criteria not addressed will be given a score of zero.

1.2 Financial Evaluation

1.2.1 Mandatory Financial Criteria

Bids must meet the mandatory financial criterion. Bidder must respect the maximum funding available for each contract resulting from the bid solicitation as indicated under the heading Actual Available Budget in Part 1, Section 2.4 - Summary (Applicable Taxes extra, as appropriate).

Bids that fail to meet this mandatory financial criterion will be declared non-responsive. Bids valued in excess of this amount will be considered non-responsive.

This disclosure does not commit Canada to pay the maximum funding available.

1.2.2 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, applicable taxes extra, as appropriate, FOB destination, Canadian customs duties and excise taxes included.

2 Basis of Selection

Basis of Selection - Highest Rated Within Budget

To be declared responsive, a bid must:

- (a) comply with all the requirements of the bid solicitation;
- (b) meet the mandatory financial criterion;
- (c) obtain the required minimum points specified for criterion «Relevance of the Technology» for the technical evaluation; and

-
- (d) obtain the minimum overall score of 65 points in the evaluation of rated technical and management criteria. The rating scale contains 100 points.

Bids not meeting (a) or (b) or (c) or (d) will be declared non responsive.

Responsive bids received will be classified in order of decreasing overall score. Responsive bid obtaining the greatest number of points and submitted will be recommended for a contract award, provided that the assessed total price does not exceed the maximum budget available for this requirement.

The overall score will be obtained by calculating the total of the scores for the "Technical and Management " set of criteria.

If more than one responsive bid has the same overall score, the bid with highest score for rated Criterion No. 3 (Understanding the Technology) will be recommended for a contract award.

If more than one responsive bid has the same overall score and the same score for rated Criterion No. 3 (Understanding the Technology), the responsive bid with the highest number of points for rated Criterion No.5 (Key resource Management Experience) will be recommended for a contract award.

PART 5 - CERTIFICATIONS

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

The certifications provided by bidders to Canada are subject to verification by Canada at all times. 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 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 with this request will also render the bid non-responsive or will constitute a default under the Contract.

1 Certifications Required to Precedent to Contract Award

1.1 Integrity Provisions-Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

1.2 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](http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml) available from [Human Resources and Skills Development Canada \(HRSDC\)](#) - Labour's website

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

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

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

1.3 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 FPS, 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 FPS 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 Additional Certifications Precedent to Contract Award

The Additional Certifications Precedent to Contract Award, should be completed and submitted with the bid but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within that time frame provided will render the bid non-responsive

2.1 Canadian Content Certification

This procurement is limited to Canadian goods and services.

The Bidder certifies that:

() a minimum of 80 percent of the total price of the bid consists of Canadian goods and Canadian services as defined in paragraph 5 of clause A3050T.

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the Supply Manual (<https://content.buyandsell.gc.ca/policy-and-guidelines/supply-manual/annex/3/6>).

Canadian Content Definition

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

2.2 Status and Availability of Resources

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

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

2.3 Education and Experience

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

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PART 6 - FINANCIAL REQUIREMENT

1 Financial Capability

Manual SACC 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.

1 Statement of Work and Requirements Documents

The Contractor must perform the Work in accordance with The Statement of Work and Requirements Document, in Annex A and the Contractor's technical Bid entitled _____, dated _____.

1.1 Work Authorization

Despite any other condition of the Contract, the Contractor is only authorized to perform the Work required to complete the Contract. Upon completion of the tasks, the Work will be reviewed before the Contractor is authorized to commence any Work for the Contract. Depending on the results of the review and evaluation of the tasks, Canada will decide at its discretion whether to continue with the Work. You should refer to Annex A, par. 3.1.5.4, Go/No-Go Decision.

If Canada decides to continue with the Contract, the Contracting Authority will advise the Contractor within ten (10) business days following the Detailed Design Review (DDR) in writing to commence work on the Contract. The Contractor must immediately comply with the notice.

If Canada decides not to proceed with the Contract, the Contracting Authority will advise the Contractor in writing of the decision and the Contract will be considered completed at no further costs to Canada. In no event will the Contractor be paid for any cost incurred for unauthorized work.

2 Standard Clauses and Conditions

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

2.1 General Conditions

2040 (2014-03-01), General Conditions - Research & Development, apply to and form part of the Contract.

2.2 Supplemental General Conditions

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

4001 (2013-01-28), Hardware Purchase, Lease and Maintenance
 4002 (2010-08-16), Software Development or Modification Services
 4003 (2010-08-16), Licensed Software

3 Term of Contract

3.1 Period of the Contract

The Contract will be for the period of December 1st, 2014 to December 1st, 2015.

4 Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Esther Paquin
 Title: Supply Specialist
 Public Works and Government Services Canada
 Quebec Region,
 7th Floor,
 Place Bonaventure, South East Portal,
 800 de La Gauchetiere Street West,
 Montreal, Qubec, H5A 1L6

Telephone: 514-496-3889
 Facsimile: 514-496-3822
 E-mail address: esther.paquin@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.

4.2 Project Authority (*will be identified in the contract*)

The Project Authority for the Contract is:

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

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

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 technical content of the Work under the Contract. Technical 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.

4.3 Technical Authority (*will be identified in the contract*)

The Technical Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail: _____.

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all recommendations to the Project Authority concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no capacity to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

4.4 Contractor's Representative

The Contractor's Representative for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone: ____-____-____

Facsimile: ____-____-____

E-mail address: _____

5 Payment

5.1 Basis of Payment

5.1.1 Firm Lot Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm lot price of \$_____ Customs duties are included and all applicable Taxes extra, as appropriate.

5.2 Limitation of Price

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

5.3 Method of Payment

5.3.1 Milestone Payment- Firm Price

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in Annex B - Basis of Payment and the payment provisions of the Contract if:

- (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111 (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/1111.pdf>) and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- (b) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
- (c) all work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

5.3.1.1 Schedule of Milestones

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

5.4 SACC Manual Clauses

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

6 Invoicing Instructions

6.1 Invoicing Instructions-Progress Claim-Firm Price

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

Each claim must show:

- (a) all information required on form PWGSC-TPSGC 1111;
 - (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
 - (c) the description and value of the milestone claimed as detailed in the Contract
2. Applicable Taxes extra, as appropriate, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.
3. The Contractor must prepare and certify one (1) original and two (2) copies of the claim on form PWGSC-TPSGC 1111, forward:
 - a) the original and one (1) copy to the Canadian Space Agency at the address shown on Page 1 of the contract (CSA Finance – Services Section) for appropriate certification by the Project Authority identified herein for appropriate certification after inspection and acceptance of the Work takes place;
 - and,
 - b) one (1) copy of the original progress claim to the Contracting Authority identified under the section entitled «Authorities» of the Contract.
4. CSA's Finance – 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.
5. The Contractor must not submit claims until all work identified in the claim is completed.

7 Certifications

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

7.2 SACC Manual Clauses

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

8 Applicable Laws

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

9 Priority of Documents

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

- (a) the Articles of Agreement;
- (b) the supplemental general conditions 4001 (2013-01-28), Hardware Purchase, Lease and Maintenance, 4002 (2010-08-16) Software Development or Modification Services and 4003 (2010-08-16), Licensed Software;
- (c) the general conditions 2040 (2014-03-01), General Conditions-Research & Development;
- (d) Annex A, Statement of Work and Requirements Document;
- (e) Annex B, Basis of Payment;
- (f) the Contractor's bid dated _____, as clarified/amended (if applicable) on_____.

10 Foreign Nationals (Canadian Contractor)

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

11 Insurance

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

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ANNEX A

STATEMENT OF WORK AND REQUIREMENTS DOCUMENT

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

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ANNEX B

BASIS OF PAYMENT

FIRM LOT PRICE Schedule of Milestones

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

| Milestone No. | Description of Deliverable | Firm Amount | Delivery Date |
|----------------------|-----------------------------------|--------------------|----------------------|
| 1 | Specify | | |
| 2 | Specify | | |
| 3 | Specify | | |
| Etc | | | |

Total Firm Price \$_____ (GST and QST Extra)

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ANNEX C (see appended document)

TECHNICAL AND MANAGERIAL BID PREPARATION INSTRUCTIONS

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ANNEX D (see appended document)

POINT RATED EVALUATION CRITERIA



Agence spatiale
canadienne

Canadian Space
Agency



CSA-EXCO-SOW-0011

RFP NO.

Canadian Space Agency

Annex "A"

Exploration Core

Small Planetary Rover Platform (SPRP)

Statement of Work (SOW)

Initial Release

April 25, 2014

SPRP Statement of Work (SOW)

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SPRP Statement of Work (SOW)

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SPRP Statement of Work (SOW)

1 INTRODUCTION

The ExCore program aims at developing and maturing technologies in preparation for future exploration mission opportunities. These activities include development of technologies from requirements definition, development of terrestrial prototypes, integration, deployment and testing up to flight analogue relevant environment such as thermo-vacuum, radiation and dusty chamber.

Under the Exploration Core program, the CSA has developed several terrestrial prototypes of rovers. One of the main goals is to increase Canadian industry, academia and government expertise in rover development. Different approaches and technologies have been explored to enhance mobility, power management, vision, navigation & control and operations. In collaboration with industry and academia, CSA has been conducting multiple analogue deployments to test these rovers within various operational contexts. This has allowed identifying the strengths and weaknesses of the rovers and their sub-systems. Table 1-1 presents the current fleet of CSA's rovers and their main characteristics.

TABLE 1-1: - FLEET OF CSA'S ROVERS

| Name | Category | Configuration | Dry-Mass | Size (L, W, H) | Prime Contractor |
|------------|----------|---|----------|------------------------|---------------------|
| Juno | Medium | 4 wheels skid-steering with active suspension | 294 kg | 1.38 m, 1.60 m, 0.75 m | Neptec Design Group |
| Artemis | Large | 8 wheels skid-steering with active suspension | 530 kg | 2.83 m, 2.12 m, 2.00 m | Neptec Design Group |
| Artemis Jr | Medium | 4 wheels skid-steering with active suspension | 230 kg | 1.47 m, 1.62 m, 1.53 m | Neptec Design Group |
| MESR | Medium | 6 wheels , 4 wheels independent steering with passive suspension | 250 kg | 2.28 m, 1.62 m, 1.85 m | MDA |
| LELR | Large | 6 wheels, 4 back wheels skid-steering and 2 front wheels Ackermann steering, passive suspension | 867 kg | 3.10 m, 1.99 m, 3.01 m | MDA |
| REX | Small | 6 wheels , 4 wheels independent steering with passive suspension | 140 kg | 1.52 m, 1.42 m, 0.76 m | MDA |
| Kapvik | Micro | 6 wheels , skid-steering with passive suspension | 27.4 kg | 0.85 m, 0.78 m, 1.21 m | MPB Communications |
| MRPTA | Micro | Configurable wheels/tracks, skid-steering with passive suspension | 30 kg | 0.61 m, 0.51 m, 0.61 m | ESI |

In 2013, two Lunar Tele-Operated In-Situ Resources Utilization (ISRU) Platform (LTOIP) concept studies were conducted to develop a detailed system concept of a polar moon rover capable of supporting ISRU RESOLVE requirements. Two concepts were proposed by the industry. These studies exploited existing ExCore terrestrial rovers and proposed adaptations in order to enable path-to-flight. Early on the moon context highlighted difficult environmental challenges such as vacuum, wide temperature range, harsh dust and severe radiation. A series of risks were raised and clearly showed a lack of know-how and expertise in those areas. To help mitigate these risks, the ExCore program put in place contracts such as the STDP Methodologies and Tools for CPU intensive algorithms migration to FPGA based implementation, the New Generation Metallic Semi-Compliant Wheels for Lunar Environment contract and finally the STDP Dust mitigation technologies (Moon, Mars).

SPRP Statement of Work (SOW)

The completion of the LTOIP concept studies nurtured a series of recommendations to be considered for the definition of the Lunar ISRU Rover requirements, in the context of a polar moon mission were determined. These recommendations were derived from several inputs:

- Exploration Surface Mobility (ESM) program results and outputs
- External Resource Prospector Mission (RPM) Concept Studies
- Internal Resource Prospector Mission (RPM) Concept Studies
- Previous lunar rover-like missions (e.g. Lunar Roving Vehicle (LRV), Lunokhod (D10))
- Other planetary rover missions (Mars Exploration Rover (MER), Mars Science Laboratory (MSL))

These recommendations favour a simple technical approach to solving the challenges associated with planetary rovers. For example, mechanism such as suspensions can jam or become stuck because of improper material selection, a lack of configuration control, small or permanent deformations caused by yielding or joint shifting, or distortions caused by temperatures. Keeping such mechanism to its simplest possible form, but that still meets the mobility requirements, will go a long way toward minimizing the development costs and maximizing the reliability.

Based on various analogue deployments, the LTOIP proposals and previous planetary missions, it appears that a simple four wheel skid-steered rover can meet the mobility requirements derived from planetary exploration of the Moon or Mars. Indeed, a series of static and dynamic analyses demonstrated that a four wheel skid-steered rover without suspension could meet the actual RPM requirements. CSA's informal mobility tests using a four wheel skid-steered rover with locked suspension also demonstrated good stability and manoeuvrability.

Mass and power are two obvious main drivers in any spacecraft design. Mass and power optimizations are mandatory to enable flight missions, and this is especially true with planetary missions. As can be seen in Table 1-1, CSA does not possess any small and low-mass four wheel skid-steering rover. While the viability of such platform has clearly been demonstrated for larger scale rovers, the mobility performance of such configuration at smaller scales, hence lower mass and power, remains unclear. Under those considerations, the CSA is seeking to obtain such a platform, in order to properly assess and evaluate its manoeuvrability and capabilities.

1.1 PURPOSE

The purpose of this SOW is to provide the CSA with a functional TRL 4 prototype of the **Small Planetary Rover Platform (SPRP)**. The main characteristics of this platform are:

1. Small footprint
2. Low cost
3. Low mass
4. Rugged

More specifically, the **Small Planetary Rover Platform** targeted architecture exhibits the following features:

- Four wheel, skid-steering platform
- Fully passive suspension, manually lockable
- Basic power system
- Power & mechanical interface to accommodate small ESM Payloads

SPRP Statement of Work (SOW)

1.2 SCOPE

The scope of this Statement of Work (SOW) encompasses the design, development, production, assembly, testing and delivery of one prototype **SPRP**. The prototype will be tested to demonstrate that it meets TRL 4 level criteria.

1.3 DOCUMENT CONVENTIONS

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

- a) "Must" or "Required" is used to indicate a contractual obligation;
- b) "Should" indicates a preferred alternative but is not a contractual obligation under the contract;
- c) "May" indicates an option;
- d) "Will" indicates a statement of intention or fact, as does the use of present indicative active verbs.

1.4 ROLES AND RESPONSIBILITIES

The Contractor will be responsible for the overall execution of the work described in this SOW.

CSA is the Technical Authority (TA) and will verify that the work is done as per this document (SOW) and accept the work and the deliverables.

SPRP Statement of Work (SOW)

2 DOCUMENTS

2.1 APPLICABLE DOCUMENTS (AD)

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

TABLE 2-1: - APPLICABLE DOCUMENTS

| AD No. | Document Number | Document Title | Rev. No. | Date |
|--------|-----------------|---|----------|------------|
| AD1. | CSA-EXCO-RD0014 | Exploration Core SPRP Requirements Document | IR | April 2014 |

2.2 REFERENCE DOCUMENTS (RD)

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

TABLE 2-2: - REFERENCE DOCUMENTS

| RD No. | Document Number | Document Title | Rev. No. | Date |
|--------|---------------------------|--|----------|-------------------|
| RD1. | CSA-ST-GDL-0001 | Technology Readiness Levels and Assessment Guidelines ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRRA/ | B | February 14, 2014 |
| RD2. | ESTEC, TEC-SHS/5574/MG/ap | Technology Readiness Levels Handbook for Space Applications ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRRA/ | | March 2009 |
| RD3. | CSA-ST-RPT-0003 | Technology Roadmap Worksheet ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRM | | July 2012 |
| RD4. | CSA-ST-FORM-0001 | Technology Readiness and Risk Assessment Worksheet: at ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRRA/Technology and Risk Assessment Worksheets and Rollup Tool/ | E | July 9, 2013 |
| RD5. | CSA-ST-RPT-0002 | Technology Readiness and Risk Assessment Data Rollup Tool ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRRA/Technology and Risk Assessment Worksheets and Rollup Tool/ | Latest | n/a |

SPRP Statement of Work (SOW)

| RD No. | Document Number | Document Title | Rev. No. | Date |
|--------|-------------------|---|----------|---------------|
| RD6. | CSA-ST-FORM-003 | Critical Technologies Elements Identification Criteria Worksheet ftp://ftp.asc-csa.gc.ca/users/TRP/pub/TRRA/Technology and Risk Assessment Worksheets and Rollup Tool/ | Latest | n/a |
| RD7. | CSA-EXCO-MAN-0001 | Exploration Core Program Mars Emulation Terrain User Guide ftp://ftp.asc-csa.gc.ca/users/excore-prototyping/pub/CSA Mars Emulation Terrain User Guide.pdf | | |
| RD8. | CSA-SE-PR-0001 | CSA Systems Engineering Methods and Practices | Rev B | March 2010 |
| RD9. | CSA-SE-STD-0001 | CSA Technical Reviews Standard | A | November 2008 |
| RD10. | CSA-ESM-PR-0001 | CSA General Drive Profile ftp://ftp.asc-csa.gc.ca/users/excore-prototyping/pub/CSA-ESM-PR-0001 CSA General Rover Drive Profile IR.pdf | IR | April 2014 |

SPRP Statement of Work (SOW)

3 WORK REQUIREMENTS

The contractor must provide all facilities, personnel, equipment, materials and services necessary to perform the work specified in this SOW, in accordance with the requirements and verification defined in this SOW.

3.1 PROJECT MANAGEMENT

The Contractor must manage the SPRP project to achieve successful performance, scope, quality, and schedule requirements of this SOW.

The Contractor must provide the management, technical leadership, and support necessary to ensure effective and efficient performance of all project efforts and activities. The Contractor must dedicate experienced personnel to the project in all the disciplines required to carry out the work.

The Contractor personnel must establish and maintain a close management and technical interface with the CSA to assure a coordinated program effort to meet or exceed the project objectives.

The Contractor must include, within its program management structure, the necessary leadership to effectively manage the performance of subcontractors in keeping with the project objectives.

3.1.1 Scope Planning (*Work Breakdown Structure and Work Packages*)

The project must be planned, controlled and directed using a Work Breakdown Structure (WBS) that organises and defines the total work scope of the project. The Contractor must update and maintain the Contract Work Breakdown Structure (CWBS) [Contract Data Requirements List (CDRL 2)] provided with the Bid.

The Contractor must establish and maintain a CWBS Dictionary defining the work to be done against each WBS element identified in the CWBS, by means of a Work Package Description (WPD) for each such element (CDRL 2). Updates of the CWBS Dictionary must be provided along with the CWBS updates.

3.1.2 Project Schedule

The Contractor must update and maintain on a monthly basis the project schedule submitted in its Bid. Table 3-1 shows the proposed Project Milestones and Meetings Schedule. The Contractor must prepare a detailed schedule with dependencies between tasks, durations, % complete, constraints. The Contractor must maintain and deliver each month the Project Schedule (CDRL 1) in native format; including the Table 3-1 milestones.

3.1.3 Project Management Control

The Contractor must establish and maintain a project management control system to effectively integrate the approved scope of work with the schedule, budget, quality and potential risk issues, maintain all project status data, and provide visibility and assurance to the CSA that the project is on schedule and that it is meeting contract and performance requirements.

The management control system must track, control and report project costs on a monthly basis through the monthly Progress Report (CDRL 6).

3.1.4 Progress Reporting

The Contractor must provide monthly Progress Reports (CDRL 6) to the CSA and to the Contracting Authority, no later than 7 working days after the end of the month covered by the report. Monthly reports must identify decisions taken during the reporting period resulting in schedule slips or changes.

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The Contractor must summarize the work accomplished during the past month and mention the tasks planned for the coming month.

3.1.5 Meetings

The Contractor must schedule and co-ordinate with all stakeholders the following meetings listed in Table 3-1.

TABLE 3-1: - PROJECT MILESTONES AND MEETINGS SCHEDULE

| Milestone | Date | Location |
|--|--|-------------------------|
| Contract Award | TBD. | -- |
| Kick-off Meeting (KOM) | No later than 2 weeks After Contract Award (ACA). | CSA's premises |
| Milestone and Progress Review Meetings | As identified by the contractor | Contractor's premises |
| Detailed Design Review (DDR) | Contract award + 4 months | Contractor's facilities |
| Go/No-Go Decision | DDR + 10 working days | N/A |
| Test Readiness Review (TRR) | 1 or 2 weeks prior to start of Environmental or Acceptance testing | Contractor's premises |
| Preliminary Acceptance Review (PAR) | 2 weeks after testing completion | Contractor's premises |
| Final Acceptance Review (FAR) | End of Contract. | CSA's premises |

At the discretion of the CSA, the Kick-off and Progress Review Meetings may be held via teleconference instead of at the location indicated in Table 3-1.

The contractor must produce and deliver to CSA the Meeting Presentation (CDRL 4) one week before each meeting. The Review Data Package (CDRL 5) must be delivered to the CSA two weeks before each review.

The Contractor may request Ad-hoc meetings with CSA whenever required to resolve unforeseen and urgent issues. The CSA may also request such Ad-hoc Meetings with the Contractor. The selection of participants will depend on the nature of the issue.

The CSA reserves the right to invite additional knowledgeable people (public servants or others under Non-Disclosure Agreement) to any Review Meeting. Key Contractor personnel involved in the work under review will attend Milestone/Project Review Meetings. The location, date and time of the Progress Review Meetings will be held at the location indicated in Table 3-1 unless mutually agreed to by the TA and the Contractor.

Unless otherwise agreed with the CSA, the Contractor must be responsible for providing Meeting Agendas (CDRL 7) and Minutes (CDRL 8) of all meetings held during the project. Minutes will primarily report decisions. The Contractor must also maintain a detailed Action Item Log (AIL) (CDRL 9) throughout the project to track actions resulting from reviews and meetings.

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3.1.5.1 Kick-Off Meeting (KOM)

At the beginning of the contract, the Contractor must hold a KOM at CSA's premises, as per the schedule presented in Table 2-1. The Contractor must provide its KOM Presentation (CDRL 3) one (1) week before the meeting. This meeting will serve to:

- a) Review the proposed Performance Evaluation Criteria (PEC). This is a list of criteria that will be used throughout the project to evaluate the Contractor's technological progress. It will be provided in the Contractor's bid and accepted at the KOM and reviewed at each Milestone/Progress Review Meeting as well as at the Contract Mid-point Work Authorization Meeting; see more information in section 3.3.1;
- b) Review contract deliverables;
- c) Review the requirements of the work;
- d) Review the work schedules;
- e) Review risk assessment and mitigation plan;
- f) Review WBS and Work Packages;
- g) Review capability to deliver work packages at agreed cost and schedule;
- h) Discuss exploitation strategy of technology and company capabilities;
- i) Discuss the Background Intellectual Property (BIP) and review the provided list;
- j) Discuss the expected Foreground Intellectual Property (FIP) and review the provided list (review Disclosure of FIP issues);
- k) Discuss any licensing issues;
- l) Review expected cash flow, and claim format;
- m) Review reporting requirements;
- n) Review communications deliverables; and
- o) Meet the personnel assigned to the work.

3.1.5.2 Milestone and Progress Review Meetings

Milestone Meetings and Progress Review Meetings will be held periodically throughout the life of the Contract to provide formal opportunities for face-to-face information exchanges as well as for progress monitoring discussions and decision making. These meetings will be scheduled by the Contractor.

The Milestone Meetings and Progress Review Meetings are intended to provide an opportunity for the Contractor, the CSA, and other invited attendees to review and discuss the following in detail:

- a) The contents of the Milestone and/or Progress Report;
- b) The current % of completion and accomplishments;
- c) The technical work of each task;
- d) The current financial status (provide a table indicating planned vs. actual milestones);
- e) The performance results with respect to the PEC;
- f) The status of Contractor's contributions (if applicable);
- g) The newly generated IP, status and progress of any inventions, including any experiments or other work needed to support a patent application;
- h) Commercialization progress, when required;
- i) Discuss Work Authorization Decisions by CSA, if applicable;
- j) Discuss relevant results achieved;
- k) Project management issues; and
- l) Other items as deemed appropriate.

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3.1.5.3 Detailed Design Review (DDR)

The purpose of the DDR is to demonstrate that the final detailed design meets all requirements and is feasible within the cost and schedule constraints, and that the project is ready to proceed with the Manufacturing, and Assembly, Integration and Test (AIT) activities. The DDR will be conducted in accordance to the entry and exit criteria specified for all CSA technical reviews in RD10.

The objectives of the DDR are to confirm that:

- a) All system and operations requirements have been allocated to lower level subsystems and CIs, and the flow-down and traceability are complete.
- b) The final detailed design meets the system, operational, environmental, design, interface, safety requirements within allocated resources and constraints;
- c) The detailed design has been proven and is final, and the project can proceed with Manufacturing and AIT;
- d) External and internal interfaces designs have been finalized, formalized and agreed with all parties involved in the system design and implementation;
- e) The detailed design, including interfaces, has been validated, and the verification and qualification approaches are viable and will confirm compliance with all requirements;
- f) The technical, cost, schedule and programmatic risks have been appropriately identified and mitigated or are on track for timely mitigation;
- g) The plans for verification, validation, AIT and logistics are complete and have been implemented to the extent required at this stage of the project;
- h) The cost and schedule estimates indicate that the project will be completed on time and within budget and that the control processes are adequate to ensure remaining within allocated resources; and
- i) Government Policies, Security and international laws Requirements are fully met.

3.1.5.4 Go/No-Go Decision

Within 10 business days following the DDR, a Go/No-Go (Work Authorization) decision will be taken by Canada as to whether or not to proceed with the follow-on activities of the Contract.

3.1.5.5 Test Readiness Review (TRR)

The purpose of the TRR is to demonstrate that the test article hardware/software, test facility, ground support personnel, and test procedures are ready for testing, and for data acquisition, reduction, and control.

The objectives of a TRR are to confirm that:

- a) The test articles have been identified as well as their configuration during test;
- b) Any changes in requirements, design, interfaces and prototype performance (margins), since the DDR, are documented and taken into account in the Test Procedures;
- c) Test plans are approved, meet verification requirements and specifications and include an accurate (realistic) testing schedule;
- d) Detailed test procedures are complete, approved and safe for test operations;
- e) Necessary resources, qualified personnel, facilities and support hardware/software are allocated, available, adequate, pertinent and verified;
- f) Pre-test requirements are met;
- g) Safety and PA plans, procedures and personnel are ready and available; and
- h) Operations scenarios are ready and available.

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More information on the conduct of TRRs is provided in section 3.4.3.

3.1.5.6 Preliminary Acceptance Review (PAR)

The purpose of the PAR is to demonstrate that the as-built and as-coded system meets the agreed set of requirements. The PAR will be conducted in accordance to the entry and exit criteria specified for the CSA Acceptance Review in RD9, adapted for a preliminary version.

The objectives of the PAR are to:

- a) Establish that the system meets requirements and acceptance criteria and will function properly in the expected operational environments, as reflected in the test data, demonstrations, and analyses; and
- b) Establish an understanding of the capabilities and operational constraints of the as-built system and as-coded system has been established.

The Contractor must prepare and deliver the End Item Data Package (EIDP) (CDRL 11) and Software EIDP (CDRL 12) 2 weeks prior to the review.

3.1.5.7 Final Acceptance Review (FAR)

The purpose of the FAR is to demonstrate that the system has been finalized, can be accepted as built and as coded and that all Requests for Action have been closed. The FAR will be conducted in accordance to the entry and exit criteria specified for the CSA Acceptance Review in RD9, adapted for a final version.

The AR examines the system, its end items, and documentation, as well as test data and analyses that support verification. The objectives of the AR are to:

- a) Establish that the system has been successfully validated and verified with no outstanding actions and open non-conformance;
- b) Establish that any changes since the PAR have been validated and verified, evaluated for mission implications, and successfully incorporated into appropriate system elements; and
- c) Establish that the as-built and as-coded system baseline documentation is complete, final and is under configuration control; the as-designed to as-built configuration changes are listed and deltas are reconciled;
- d) Establish that all system development risks have been retired; and
- e) Safety verifications and corrective actions are successfully completed.

The Contractor must prepare and deliver the final End Item Data Package (EIDP) (CDRL 11) and Software EIDP (CDRL 12) 2 weeks prior to the review.

The FAR will be considered complete when all related requirements have been successfully verified, final versions of CDRLs have been approved, all actions closed and all deliverables (hardware, software and CDRLs) have been received at CSA.

3.1.6 Subcontract Management

The Contractor must be fully responsible for implementation and execution of all tasks, including those subcontracted to others. Whenever this is the case, the Contractor must prepare and maintain subcontract Statements of Work, technical requirements documents, etc., necessary to effectively manage the subcontractors' work. At the request of the CSA, copies of subcontractor documentation must be delivered to the CSA.

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3.1.7 Crown Inventory Database

N/A.

3.1.8 Intellectual Property

The Contractor must mark or identify any proprietary information delivered to the CSA in accordance with the instructions contained in the Contract.

The Contractor must produce and maintain the Background and Foreground Intellectual Property (BIP/FIP) Report (CDRL 10) throughout the contract, and deliver the report as specified in Table 3-4.

3.1.9 Risk Management

The Contractor must implement a risk management process supporting identification and assessment of risks that may impact schedule and technical performance, and the development of appropriate risk response/risk mitigation plans. The Contractor must assess and report the status of each risk element in the monthly Progress Report (CDRL 6) and during progress reviews.

3.2 SAFETY AND PRODUCT ASSURANCE (S&PA)

The work packages defined in this section must be performed during all phases of the project.

3.2.1 Product Assurance (PA)

The Contractor must ensure that the end product meets the PA requirements stipulated in AD1.

3.2.2 Safety

The contractor must implement its in-house standard safety procedures and practices in the design and manufacturing of these prototypes.

3.3 ENGINEERING**3.3.1 Performance Evaluation Criteria (PECs)**

The Contractor must establish a set of PECs to show the current performance expectations of the system with respect to key performance and resource parameters, and the comparison of current predictions versus the defined requirements. It allows trends in the program technical progress to be discerned. It is a summary of the analyses for decomposition of requirements and for prediction of PEC behaviour. The PEC Report (CDRL 16) must be presented first at the KOM, and then at each formal Review. In addition, the Monthly Progress Report must report the current status of PECs; see DID-0003 (Progress Report) and DID-0225 [Performance Evaluation Criteria (PEC)] for specific requirements.

3.3.2 Design and Development

The Contractor must develop the SPRP design and specifications in accordance with the requirements in this SOW, and the associated test support equipment. The contractor must perform systems engineering, electrical, mechanical, optical (if applicable), and software design of the SPRP.

The contractor must develop the SPRP System Specification (CDRL 13), architecture definition, engineering models and design analyses (CDRL 17), design documents (CDRL 18), engineering budgets, layouts, drawings, technical notes as applicable, to support the SPRP design.

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3.3.3 Technology Readiness Level Assessment

The Contractor must perform a Technology Readiness and Risk Assessment (TRRA) in accordance with the requirements of the CSA Technology Readiness and Risk Assessment Guidelines (RD1) and the Technology Readiness Levels Handbook for Space Application (RD2), to formally document the system technology status. The Contractor must produce CDRL 14 for the TRRA using Technology Readiness and Risks Assessment Worksheet (RD3) for each Critical Technology Element (CTE) and Rollup using RD4 (RD5, RD6).

3.3.4 Technology Roadmap

The Contractor must provide a Technology Development Plan, aka Technology Roadmap (TRM), CDRL 15, including the required technology developments to meet mission needs, and a plan and timeline to reach TRL 6 and 8. The TRM must be provided as well in the format of RD3.

3.3.5 Verification Plan

The Contractor must perform verification activities on the detailed design to demonstrate that it complies with the requirements. A Verification Plan (CDRL 20) must be developed for the purposes of assessment and ultimate validation of the system. The methods and techniques to be used for measuring and evaluating the system to ensure compliance with the system requirements must be described and must be in accordance to the requirements of this SOW (Section 3.5 and DID-0262). The plan must address test and evaluation activities on a fully integrated basis, employing an appropriate combination of simulation and other analytical tools, mock-ups, laboratory models, and prototype models. The plan must also address the testing environment requirements.

The contractor must also develop a Verification Compliance Matrix (VCM) (CDRL 23). It provides the detailed linkage of verification activities to the specific requirements they address. The VCM must be a distinct document from the Verification Plan.

3.4 MANUFACTURING AND TESTING

The purpose of this contract is to provide a functional TRL 4 prototype of the **Small Planetary Rover Platform (SPRP)**. As listed in Table 3-1, TRR and PAR will be achieved at contractor's premises and the FAR at CSA's premises. Between the PAR and the FAR, CSA and the contractor will perform a series of mobility tests to ensure the rover meet the specifications using the CSA analogue terrain as described in RD10. CSA engineers will conduct the tests along with the contractor. The main objectives of these test are to enable CSA to :

1. Identify infant mortality failures of the test rover as a whole and its subsystems;
2. Measure the performance of the rover and its subsystems;
3. Ultimately the objective is to one day be able to measure the random and wear out failures. Such data in conjunction with reliability modeling would enable the full characterization of rover reliability.

3.4.1 Manufacture, Assembly and Integration

The Contractor must manufacture and assemble the SPRP in accordance with the design approved by the CSA. CSA must have the right to witness any tests or inspection conducted on the SPRP instrument. The contractor will notify CSA not less than five (5) working days in advance of any significant inspections or tests. Availability of invitees must not delay the execution of the tests per the contractor schedule.

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3.4.2 Test Procedures and Test Reports

The contractor must prepare and deliver to CSA the Test Procedures according to CDRL 21.

The Contractor must prepare and deliver to CSA the Test Reports in accordance with the CDRL 22.

3.4.3 Test Readiness Review (TRR)

Before the start of acceptance testing, the Contractor must conduct a TRR to authorize the start of testing. The TRR must be held at the completion of assembly and integration and prior to the start of acceptance testing. The Contractor must notify the CSA of the TRR date a minimum of five working days in advance and provide the associated TRR data package or completed checklist at the TRR. The Contractor must update/develop and deliver all applicable documents at TRR. At the TRR, the Contractor must address the following items:

- a) Test Article is described including the part number, the serial number and the revision level as built and as designed and software revision;
- b) Outstanding or open items
- c) Dry-run test results where available;
- d) Status of documentation used for the test;
- e) Test Schedule and manpower;
- f) Test equipment status (including calibration, Test Software and Test Facility status); and
- g) Special concerns (e.g. personnel or hardware safety concerns).

After the data analysis for a given test has been completed and the contractor systems engineering team has concluded that a test activity is complete, the Contractor must conduct a Test Review to review the analysis of the test results. The objective of this review is to confirm pass/failure status of tests, record the non-conformances and confirm that the test configuration can be broken. CSA must be invited to the test reviews with at least 24hrs advance notice.

For all environmental test reviews, CSA must co-chair the Test Review Board (TRB) with the contractor and must have approval rights on the TRB decision.

3.4.4 SPRP User Guide

The Contractor must develop the SPRP User Guide as per CDRL 24.

3.5 VERIFICATIONS

The Contractor must perform all required verification activities stipulated in the Requirements Document (AD1).

All requirements must be verified by one or more of the following verification methods:

- a) analysis (including simulation);
- b) review of design;
- c) demonstration;
- d) inspection; and
- e) test.

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These methods are described in DID-0262.

3.6 CONTRACTOR DELIVERABLES

3.6.1 *Hardware Deliverables*

The Contractor must package and deliver the hardware listed in Table 3-2, at the place and date to be advised by the TA.

Formal acceptance of the deliverables will be carried out at CSA, unless otherwise specified by CSA.

The CSA is the formal recipient of all deliverables. All delivered items will become and remain the property of CSA.

The Contractor must provide a shipping container for each deliverable item. These must enable the equipment to withstand the transportation and handling environments (shock, vibration, thermal, ambient pressure, contamination, etc.) likely to be encountered.

TABLE 3-2: - HARDWARE DELIVERABLES

| Hardware | Delivery Date | Quantity |
|----------------------------|-----------------|----------|
| SPRP Prototype | End of contract | 1 |
| Battery Charger | End of contract | 1 |
| Wheels (e.g. Rubber) | End of contract | 4 |
| E-Stop | End of contract | 1 |
| Radio Frequency Controller | End of contract | 1 |

3.6.2 *Software Deliverables*

The Contractor must package and deliver the software listed in Table 3-3 and the Software EIDP (CDRL 12), at the place and date to be advised by the TA.

TABLE 3-3: - SOFTWARE DELIVERABLES

| Software | Delivery Date |
|------------------------|-----------------|
| SPRP On-Board Software | End of contract |

The Contractor must develop Software Version Description Documents (VDDs) (CDRL 19) to describe all as-built configurations of the software.

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.

All delivered non-Commercial-Off-The-Shelf (non-COTS) software must include executable code, the source listings and source files, compiled files, configuration and parameter files, reloadable Field Programmable Gate Array (FPGA) configuration files, test scripts, design documentation, users' manuals, test results and associated plans and procedures.

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All 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.

All COTS software must be accompanied by a license that allows CSA to use the software for at least one year following final acceptance.

3.6.3 Document Deliverables

The Contractor must prepare and deliver the documents as requested in the CDRL in Table 3-4 below. Documents submitted by the Contractor will be approved or reviewed in accordance with the Approval Category of each deliverable. The Contractor must obtain approval from the TA as per the document approval procedures below for all CDRL documents listed in Table 3-4 and marked as Approval Category "A".

3.6.3.1 Document Deliverables, Format and Content

The Contractor must ensure that documents delivered comply with the general preparation instructions and applicable Data Item Description (DID) contained in Appendix A.

The English language must be used throughout. System International (SI) units should be used/supplied by the Contractor. A conversion factors table must be supplied for all non-SI units used in the deliverable documents.

Documents must be delivered in the original software application format, plus in Portable Document Format (PDF). One electronic copy of each deliverable document must be transferred to the CSA at the address and in the format specified in DID-0000, section 1.1. No paper copy is to be delivered, except that one physical/paper copy of the EIDP (CDRL 11) must be delivered to the TA.

3.6.3.2 Documents Review and Approval

The term "Approval", as used in this document and in other documents referred to herein, means written approval by the CSA, of documents submitted by the Contractor. Once approved, the document is authorized for further use by the CSA. The document may not be changed without the CSA's approval. No request or document for which approval is required may be acted upon or implemented by the Contractor until such approval is provided. Such requests and documents will be reviewed promptly by the CSA and the necessary written approval or disapproval will be provided after their receipt by CSA. In the event of a failure by the CSA to provide a disposition to a document within prescribed delays, the documents may be deemed approved.

The term "Review" as used in this document and in all other documents referred to herein means, unless specifically stated otherwise, a CSA review of the documents submitted for that purpose by the Contractor. The acceptance by the CSA of a document for review implies that the document has been reviewed, commented on, revised as necessary, and has been determined to meet the requirements. In the event of a failure by the CSA to provide a disposition to a document within prescribed delays, the document must be deemed to have been reviewed and accepted by the TA without comment.

In the event that CSA rejects a document or request, it will notify the Contractor in writing as to the reasons for rejection and will define the additions, deletions or corrections that the CSA deems necessary to render the request or document acceptable.

Rejected requests or documents that are subsequently amended by the Contractor and resubmitted for disposition by CSA will be evaluated solely to ensure that issues raised in the previous evaluation have been addressed to CSA's satisfaction.

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The Contractor is obligated to consider implementation of the changes suggested by CSA insofar as the changes are in accordance with the relevant DID in Table 3-4 and this SOW.

The CSA does not take responsibility for the validity of the data, or statements, and the Contractor is fully responsible for the content and secondary effects derived there from.

Abbreviations used in Table 3-4:

- 'A' stands for 'Delivered for CSA Approval';
- 'R' stands for 'Delivered for CSA Review'.

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TABLE 3-4: - CONTRACT DELIVERABLES REQUIREMENTS LIST (CDRL)

| CDRL No. | Deliverable | Due Date | Version | Approval Category | Did No. |
|-----------------|--|--|------------------------------------|--------------------------|----------------|
| 1. | Project Schedule | KOM – 1 week 7 th of each Month | Initial Update | R | DID-0004 |
| 2. | CWBS and WPDs | KOM As required | Update Update | A | DID-0002 |
| 3. | KOM Presentation | KOM – 1 week | Final | R | Cont. Format |
| 4. | Milestone/Progress Review Meeting Presentation | Meeting – 1 week | Final | R | Cont. Format |
| 5. | Review Data Package | DDR – 2 weeks TRR – 2 weeks PAR – 2 weeks FAR – 2 weeks | Final | A | DID-0009 |
| 6. | Progress Report | 7 th of each Month | Final | A | DID-0003 |
| 7. | Meeting Agenda | Meetings – 2 weeks | Final | R | DID-0006 |
| 8. | Meeting Minutes | Meetings + 1 week | Final | R | DID-0007 |
| 9. | Action Item Log | Meetings + 1 week | Final | R | DID-0008 |
| 10. | BIP/FIP Disclosure Report | PAR – 2 weeks FAR – 2 weeks | Draft Final | A | DID-0111 |
| 11. | EIDP | PAR – 2 weeks FAR – 2 weeks | Draft Final | A | DID-0010 |
| 12. | Software EIDP (SW EIDP) | PAR – 2 weeks FAR – 2 weeks | Draft Final | A | DID-0011 |
| 13. | System Specification | DDR–2 weeks PAR – 2weeks FAR – 2 weeks | IR Update Final | A | Cont. Format |
| 14. | Technology Readiness and Risk Assessment Worksheets and Rollup | DDR–2 weeks PAR – 2 weeks FAR – 2 weeks | Draft Update Final | A | DID-0217 |
| 15. | Technology Roadmap Worksheet | DDR – 2 weeks FAR – 2 weeks | Draft Final | A | DID-0218 |
| 16. | Performance Evaluation Criteria (PEC) Report | KOM – 1 week DDR – 2 weeks PAR – 2 weeks FAR – 2 weeks | Draft Update Update Final | A | DID-0225 |

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| CDRL No. | Deliverable | Due Date | Version | Approval Category | Did No. |
|-----------------|---------------------------------|--|---------------------------------|--------------------------|----------------|
| 17. | Engineering Models and Analyses | DDR – 2 weeks PAR – 2 weeks FAR – 2 weeks | IR Update Final | A | DID-0236 |
| 18. | Design Document | DDR– 2 week PAR – 2 weeks FAR – 2 weeks | IR Update Final | A | DID-0260 |
| 19. | Software VDD | PAR – 2 weeks FAR – 2 weeks | IR Final | A | DID-0263 |
| 20. | Verification Plan | DDR– 2 weeks PAR – 2 weeks FAR – 2 weeks | IR Update Final | A | DID-0262 |
| 21. | Test Procedure | DDR – 2 weeks TRR – 2 weeks | Draft Final | A | DID-0280 |
| 22. | Test Report | Test completion + 1 week FAR -2 weeks | IR Final | A | DID-0285 |
| 23. | Verification Compliance Matrix | DDR – 2 weeks TRR – 2 weeks PAR – 2 weeks FAR – 2 weeks | IR Update Update Final | A | DID-0215 |
| 24. | User Guide | PAR – 2 weeks FAR – 2 weeks | IR Final | A | DID-0301 |

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4 GOVERNMENT FURNISHED EQUIPMENT

The following equipment will be provided to the Contractor by the CSA as Government Furnished Equipment (GFE) for the purpose of testing:

- CSA Compliant Wheels (4 units)
- Amphenol D38999/20FC4SN with sealing cap D38999/33M13R Power Connectors (2-4 units)
- Amphenol RJFTV2 Data Connectors (2-4 units)
- CSA will provide the CSA Analogue Terrain during the FAR demonstration (the assumption is that it will be performed at the CSA Analogue Terrain) for a duration of 1 week maximum (RD7). Appropriate travelling or transportation expenses for hardware and personnel are to be included in the contractor's bid as well as any dependencies on communications frequency or related equipment utilization approval.

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APPENDICES

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DID-0000 - General Preparation Instructions

PURPOSE:

This DID describes the standard format for the preparation of deliverable project documentation. All documentation must be written in English and must be delivered in electronic format, on a DVD-ROM. 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. Electronic Copies

Electronic documents must be prepared using the most appropriate tool (Microsoft Word, Excel, MS Project, etc.); released versions must be delivered in electronic format. Documents whose native format is not a common office program must be delivered in PDF in addition to the native format. Documents must be delivered via e-mail or direct transfer (FTP). For direct transfer, a notification of the document's readiness and location on a Contractor repository must be sent.

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

WXYZ-CDRL-NUM-CIE_ContractNumber_DOC_TITLE_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) |
| DOC_TITLE | Name of the document according to the DID |
| Contract Number: | For example: _9F028-07-4200-03 |
| _sentYEAR-MONTH-DAY: | Date Tracking Number |

Electronic documents or notifications of their availability on Contractor repositories must be sent to:

CM_Receipt@asc-csa.gc.ca

Emails are to contain the project/program acronym or equivalent identifier in the "Subject" line and include the CDRL identifier under which deliverable documents are being submitted. Hard copy and media deliverables are to be addressed to:

Configuration Management (CM) Library, 6A-100
 Attention: CSA ExCo CONTRACT NAME Contract
 Canadian Space Agency
 6767, Route de l'Aéroport
 Longueuil, QC, J3Y 8Y9
 CANADA

The DVD-ROM label must present the following information:

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- a) Company Name
- b) Project Name
- c) Contract Number
- d) Milestone

1.2. Metadata on deliverables

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

TABLE A-1: - METADATA REQUIRED

| Provided by Supplier | Metadata Description | Comments |
|----------------------|---|--|
| Yes | CSA Project Identifier | Project Acronym |
| Yes | Contract Identifier | PWGSC identifier |
| Yes | Contract Revision Identifier | PWGSC identifier |
| Yes | SOW Identifier | CSA Doc ID |
| Yes | SOW Revision Identifier | CSA Doc Revision ID |
| Yes | Document Type | Drawing, 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) |
| 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. |
| Yes | Deliverable Type | Drawing, 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 | |
| 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 | |

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| Provided by Supplier | Metadata Description | Comments |
|-----------------------------|---|--|
| 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 |
| Yes | Associated Project/System Milestone Review | DDR, etc. When Reviews are at sub-system level, identify accordingly. e.g. Bus DDR |
| 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 |

1.3. Electronic Documents Format

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

1.3.1. 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.

1.3.2. 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.

1.4. Updated Documents

Changes in previously released documents must be done in tracking mode.

2. DOCUMENT STRUCTURE AND CONTENT

2.1. Overall

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

- a) Cover/Title Page;
- b) Table of Contents;
- c) Scope;
- d) Applicable and Reference Documents;
- e) Body of Document; and
- f) Appendices

2.2. Cover/Title Page

The title page must contain the following information:

- a) Document Number and date: Volume x of y (if multivolume)
- b) Rev. indicator / date of Rev.
- c) Document Title
- d) Project Name
- e) Contract No.
- f) CDRL Item No. or Nos., if one document responds to more than one CDRL, subject to prior approval from the TA.
- g) Prepared for: Canadian Space Agency
- h) Prepared by: Contractor name, CAGE Code, address, and phone number
- i) Product tree identifier, if applicable

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 figure, table, and appendix, in that order.

2.4. Scope

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

- a) Identification (number, title) of the system, hardware, or software to which the document applies;
- b) A brief overview of the system to which the document applies; and
- c) A summary of the purpose and content of the document.

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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.

3. SUBMISSION OF DATA

Data must be submitted via Letter of Transmittal (or an electronic equivalent as mutually agreed by the TA and the Contractor), and acknowledged. The Letter of Transmittal will contain as a minimum, the Contract Serial Number, the CDRL Number and the Title. 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.

4. ALTERNATIVE FORMAT

Alternative CDRL document format, content and submission methods can be submitted to CSA for approval so long as they meet the intent and purpose of the DID.

SPRP Statement of Work (SOW)

DID-0002 – CWBS and Work Package Descriptions**PURPOSE:**

The Contractor Work Breakdown Structure (CWBS) must be used by the Contractor as the basis for work planning, estimating resources, scheduling the work, responsibility assignment, budgeting, work authorization, problem identification, performance management and analysis, and for reporting and controlling costs and schedule.

PREPARATION INSTRUCTIONS:

The Contractor must provide a WBS describing all the project elements that organise and define the total scope of the project, and must be deliverable-oriented.

The Contractor must prepare and maintain a WBS Dictionary made up of WPDs for every element to the lowest level of the WBS. Each WPD must include, as a minimum:

- a) A unique identifier traceable to the WBS;
- b) A title;
- c) The name of the individual responsible for completion of the work;
- d) The scope of the Work Package (WP);
- e) The start date and duration;
- f) Required inputs and dependencies;
- g) A description of every activity covered by the WPD including total hours, and all non-labour costs;
- h) Assumptions; and
- i) Output and WP acceptance criteria.

SPRP Statement of Work (SOW)

DID-0003 – Progress Report**PURPOSE:**

The Progress Report records the status of the work in progress during the previous calendar period. The Progress Report is used by the Government to assess the Contractor's progress in performance of the work.

PREPARATION INSTRUCTIONS:

The Progress Report must comprise, but not limited to, the following sections:

- 1) Statement indicating whether or not the project is on schedule and, if not, an explanation for any delays and/or a recovery plan. The report must include an updated schedule showing progress of work and modifications, if any;
- 2) Statement indicating whether or not the project is within budget and, if not, an explanation for the deviation from the budget and a proposed recovery plan. The report must include an updated cash flow table showing, for each activity/milestone/Work Package, start and end dates as well as actual cash flow with actual start and end dates;
- 3) Brief summary of the technical progress of the work for each work package, including:
 - a) Description of major items developed, purchased or constructed during the reporting period, and
 - b) List of internal engineering reports produced during the reporting period;
 - c) PEC requirements trends, estimates and current margins,
- 4) Summary of the proposed work for the following month, including:
 - a) Description of major items to be purchased during the next reporting period, including any software packages, and
 - b) Estimated date of completion for the next milestones;
- 5) Summary of problems encountered, their impact on the project and the subsequent solutions proposed or implemented;
- 6) Trip reports for each conference attended or facilities visited in the course of this contract (and only if funded by the contract);
- 7) Subcontractor events (reviews, milestones, etc.), status and issues; and
- 8) Risk posture analysis: Risk status report including previous issues resolved, status on on-going risks (changes and impacts), and identification of new risks, their impact and proposed mitigation action.

An overall assessment of the project health must be provided at the start of each report. The aim is to have an overview of the project status. Table A-2 shows the information required and in what format.

SPRP Statement of Work (SOW)

TABLE A-2: - PROJECT HEALTH STATUS

| Project Element | Status | Trend | Comment |
|-----------------|--------|-------|---------|
| Cost | Green | ↑ | |
| Schedule | Green | ↓ | |
| Results / PEC | Red | ↔ | |
| Programmatic | Yellow | ↑ | |

The first column identifies the project performance metrics to be assessed, namely Project Element. The four metrics to assess are:

- Cost,
- Schedule,
- Results against PECs, and
- Programmatic.

The Cost, Schedule and Results/PEC metric are quantitative indicators, while the Programmatic metric is qualitative.

The second column of the table shows the status for each project element. Table A-3 provides a definition of the different possible statuses for each of the first three Project Elements.

TABLE A-3: - STATUS INDICATORS DEFINITIONS

| Status Indicator | Interpretation | | |
|------------------|--|----------------------------------|--|
| | Cost | Schedule | Technical |
| Green | On or under planned project total budget | On or ahead of baseline schedule | Meets PEC |
| Yellow | Between 0 and 5% overrun | Between 0 and 5% behind schedule | Does not meet PEC but has approved recovery plan |
| Red | Greater than 5% overrun | Greater than 5% behind | Does not meet PEC and does not have approved recovery plan |

As for the Programmatic element, the status is evaluated based on the status of the three other elements. Although the Programmatic metric takes into account Cost, Schedule and Results/PEC indicators, it is mostly influenced by the most critical element at that point in time in the project. The third column in Table A-2 is an assessment of the trend the Project metric.

Table A-4 shows the available choices.

SPRP Statement of Work (SOW)

TABLE A-4: - TREND INDICATORS DEFINITIONS

| Trend Indicator | Interpretation |
|------------------------|--|
| ↑ | The status has improved since the last review |
| ↓ | The status has worsened since the last review |
| ↔ | The status has not changed since the last review |

The fourth column in Table A-2 is to provide the opportunity to comment the status and trend of the project element or to provide a general statement.

SPRP Statement of Work (SOW)

DID-0004 – Detailed Project Schedule**PURPOSE:**

To provide a schedule planning and control system for the project and to provide visibility to the CSA into the program progress and status.

PREPARATION INSTRUCTIONS:

The project schedule must be based on the CWBS, in the form of a Gantt chart. The project schedule must be detailed enough to show each CWBS task to be performed, and must provide the following information:

- 1) dependencies,
- 2) resource requirements,
- 3) the start and end date of each task (baseline and actual),
- 4) task duration,
- 5) completion status in percentage;
- 6) deadlines and milestones, and
- 7) critical path.

The schedule must show dependencies between the Contractor and other organizations.

The tasks related to deliverables must be limited to three months in the project schedule. When applicable, the Contractor must divide longer tasks into smaller significant tasks.

Tasks that are not related to any specific deliverable, such as Project Management and Quality Assurance activities, must be grouped separately from the groups of deliverables, and must be shown at the top of the chart. The schedule must be provided in its native tool format; MS project or PS8 are the two accepted formats, as well as in PDF.

SPRP Statement of Work (SOW)

DID-0006 – Meeting Agenda**PURPOSE:**

To clarify the purpose and content of a meeting.

PREPARATION INSTRUCTIONS:

The meeting agendas must 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;
- f) Mandatory and desirable attendance; and
- g) Expected duration.

2) DOCUMENT BODY:

- a) Introduction, purpose, objective;
- b) Opening Remarks: CSA;
- c) Opening Remarks: Contractor;
- d) Review of previous minutes and all open action items;
- e) Project technical issues;
- f) Project management issues;
- g) Other topics;
- h) Review of newly created/closed action items, decisions, agreements and minutes; and
- i) Set or confirm dates of future meetings.

SPRP Statement of Work (SOW)

DID-0007 – Minutes of Meetings**PURPOSE:**

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

PREPARATION INSTRUCTIONS:

Minutes of meeting must be prepared for each formal review or meeting and must include the following information, as a minimum:

- 1) Title page containing the following:
 - a) Title, type of meeting, date, time and duration.
 - 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 (DID-0006);
- 5) Summary of the discussions, decisions and agreements reached;
- 6) List of the 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 must 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."

SPRP Statement of Work (SOW)

DID-0008 – Action Items Log**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.

SPRP Statement of Work (SOW)

DID-0009 – Review Data Packages**PURPOSE:**

The Review Data Package is a collection of all documents to be presented by the Contractor for all formal Technical Reviews:

PREPARATION INSTRUCTIONS:

Each Review Data Package must contain the documents identified in the CDRL (Table 3-4) as due for that review, plus the presentations made at the meeting, the agenda, the minutes, and the AI list.

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DID-0010 – End Item Data Package (EIDP)**PURPOSE:**

Data to document the design, fabrication, assembly, integration and testing of the deliverable hardware.

PREPARATION INSTRUCTIONS:

An EIDP must be prepared for each deliverable assembly. The EIDP must be delivered in electronic format with a search function or interface. Upgrade changes performed as a result of the first phase deployment must be clearly identified. The contents of the package must include, but not be limited to, the following information:

- 1) All hardware prototype and GSE including cables
- 2) As-Built data: "As-Built" hardware documentation is a compilation of items describing exactly the configuration of a fabricated serialized assembly including:
 - a) Part number and revision letter of each item
 - b) Part description (title) of each item
 - c) Electronic part reference designation
 - d) Manufacturer
 - e) Procurement specification or Source Control Drawing (SCD) number and SCD revision letter.
- 3) A complete list of the tests performed including a compilation of test data and test results for each test.
- 4) A list of open work/tests
- 5) Listing of the As-Designed drawings & parts list, with reconciliation of As-Designed vs. As-Built for any deltas between them, for each indented line item of the end item deliverable.
- 6) A summary and copies of all deviations and waivers applicable to the deliverable items.
- 7) A one time delivery, with updates as required:
 - a) A complete and up-to-date top assembly drawing of each type of delivery.
 - b) Complete and up-to-date mechanical and electrical Interface Control Documents (ICDs) (interface drawings and specifications), for each delivery.
 - c) For electronic assemblies, a complete set of circuit schematics and circuit data sheets available for review at the Contractor's premises.

SPRP Statement of Work (SOW)

DID-0011 – Software End Item Data Package**PURPOSE:**

Data to document the design, development, assembly, integration and testing of the deliverable software.

PREPARATION INSTRUCTIONS:

An EIDP 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 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), 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.

SPRP Statement of Work (SOW)

DID-0110 – Crown Inventory Database**PURPOSE:**

The purpose of the Crown Inventory Database is to record formally the inventory of all Crown property produced and/or acquired under the contract by the Contractor and any of its subcontractors.

PREPARATION INSTRUCTIONS:

This document must list all the material produced under the contract. For each item, the following must be listed and refer to the table below:

- 1) Contractor's Identifier (part number);
- 2) Name;
- 3) Manufacturer's Model No.;
- 4) Manufacturer's Serial No.
- 5) Description
- 6) Controlling specification, such as drawing number, source control drawing, etc.
- 7) Date item was produced and/or acquired by the Contractor;
- 8) Current location; and
- 9) Recommended disposal: delivery to Crown location, delivery to third party, storage at Contractor location, storage at subcontractor location, IP sensitivity, or other recommendation.

SPRP Statement of Work (SOW)

DID-0111 – Background and Foreground Intellectual Property (BIP/FIP) Disclosure Report

PURPOSE:

The BIP/FIP Disclosure Report serves to identify FIP produced under the Contract with the CSA, as well as any BIP the Contractor intends to use to develop the FIP.

PREPARATION INSTRUCTIONS:

Background Intellectual Property (BIP)

The Contractor must respond to the following questions in Table A-5 when FIP is created under the Contract with the CSA.

If the Contractor used or intends to use BIP to develop FIP, the Contractor must complete Table A-6 (Disclosure of BIP brought to the project by the Contractor).

TABLE A-5: - BIP/FIP DISCLOSURE

| Disclosure of Foreground and Background Intellectual Property (BIP/FIP) | |
|--|----------------------------|
| 1. Contractor Legal Name: | 4. Contract #: |
| 2. Project Title supported by the Contract: | 5. Date of the disclosure: |
| 3. CSA Project Manager of the Contract: | |
| 6. Will there be Contractor's Background Intellectual Property brought to the project: <input type="checkbox"/> Yes - Complete Section 9 (Disclosure of Background Intellectual Property) <input type="checkbox"/> No | |
| 7. What was the objective of the project and how the FIP meets this objective? | |
| <p><i>The representative of the Contractor must sign and date the disclosure form and send the form and tables to the CSA Project Manager. The CSA Project Manager will then forward the documents to Josée Labrecque at the Intellectual Property Management and Technology Transfer office: IPPT@asc-csa.gc.ca</i></p> <p>For the Contractor</p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <p>_____ Signature</p> <p>_____ Name</p> </div> <div style="width: 45%;"> <p>_____ Date</p> <p>_____ Title</p> </div> </div> | |

Before contract closure, the Contractor must review its BIP disclosure and update the information provided as part of the Contractor's proposal. For the purpose of updating the BIP information, the table below is provided and must be filled out.

SPRP Statement of Work (SOW)

The BIP table requires that each of the following be provided for each BIP:

- BIP #: simply assign a sequential number to each BIP in the table;
- Title of the BIP: provide a descriptive title of the BIP;
- Type of BIP: specify if the BIP relates to software algorithms, hardware design, invention patent, or other;
- Type of BIP access: describe the type of access to the BIP that was required in order to use, modify, improve and further develop the BIP;
- BIP Description: provide an explicit and detailed description of the BIP (refer to pertinent sections of the Technical Report, if necessary).
- Reference Documentation: specify if the documentation referred to was a technical report, design document, test results, other;
- Origin of the BIP: specify if the BIP originated from internal R&D, collaborative project, a specific contract, other; and
- Owner of the BIP: provide names and addresses of the owner of the BIP (contractor, subcontractor or Canada).

TABLE A-6: - BIP DISCLOSURE

| BIP # | Title of the BIP | Types of BIP | Type of access | BIP Description | Reference Documentation | Origin of the BIP | Owner of the BIP |
|-------|------------------|--------------|----------------|-----------------|-------------------------|-------------------|------------------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Please specify the name and the position of the person approving/authorizing this disclosure. This person is to sign and date the disclosure. The following notice must be visible at the top of every page of the BIP disclosure:

"Use, duplication or disclosure of this document or any of the information contained in this document, in whole or in part, without the prior written permission of "Owner of BIP" is expressly prohibited."

Foreground Intellectual Property (FIP)

The Contractor must also complete Table A-7 (FIP Disclosure). The Contractor must respond to the following for each FIP element.

- FIP #: simply assign a sequential number to each FIP in the table;
- Title of FIP: provide a descriptive title of the FIP;
- Type of FIP: specify if the FIP relates to copyright, invention, design, software, know-how, trade secret, algorithms, other;
- FIP Description: provide an explicit and detailed description of the FIP (refer to pertinent sections of the Technical Report, if necessary).
- Reference Documentation: specify if the documentation referred to was a technical report, design document, test results, other;

SPRP Statement of Work (SOW)

- Owner of the FIP: provide names and addresses of the owner of the FIP (contractor, subcontractor, or the Canada).

TABLE A-7: - FIP DISCLOSURE

| FIP # | Title of FIP | Type of FIP | FIP Description | Reference Documentation | Owner of the FIP* |
|-------|--------------|-------------|-----------------|-------------------------|-------------------|
| | | | | | |
| | | | | | |

If Canada or the CSA is the owner of the FIP developed under the Contract, the Contractor must complete Table A-8 (Canada's Owned FIP Additional Information) and provide the following information:

- FIP #: simply assign a sequential number to each FIP in the table;
- Title of FIP: provide a descriptive title of the FIP;
- FIP Description: provide an explicit and detailed description as well as aspects that are novel, useful and non-obvious;
- Limitation: Provide limitations or drawback of the FIP;
- References: Provide references in literature or patents pertaining to the FIP;
- Has the FIP been prototyped, tested or demonstrated (e.g., analytically, simulation, hardware)? If so, provide results;
- Inventors: Provide name, coordinates and company of inventor(s) – (e.g., the person(s) who created the FIP); and
- IP Disclosure: Was the FIP or any element declared, disclosed to other parties? If so, when, where, to whom?

TABLE A-8: - CANADA'S OWNED FIP ADDITIONAL INFORMATION

| FIP # | Title of FIP | FIP Description | Limitations or drawback | References | Has the FIP been prototyped, tested or demonstrated | Inventors | IP Disclosure |
|-------|--------------|-----------------|-------------------------|------------|---|-----------|---------------|
| | | | | | | | |
| | | | | | | | |

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

This following notice must be visible at the top of every page of the FIP disclosure:

"Use, duplication or disclosure of this document or any of the information contained in this document, in whole or in part, without the prior written permission of "Owner of FIP" or the government of Canada is expressly prohibited."

SPRP Statement of Work (SOW)

DID-0215 – Verification and Compliance Matrices**PURPOSE:**

The Verification and Compliance Matrix shows the details of the compliance of the system and the verification thereof through the life of the project with respect to each system requirement. It is a living document that is updated at each review with new data. The matrix is tightly coupled with the Verification Plan because it provides the detailed linkage of verification activities to the specific requirements they address. However, it is a separate document from the Verification Plan.

PREPARATION INSTRUCTIONS:

The Requirements Verification and Compliance Matrices must contain, for each requirement:

- 1) The requirement document number and requirement identifier,
- 2) The requirement description,
- 3) Other relevant requirement references,
- 4) Verification method;
- 5) Requirement compliance based on verification data presented at the current phase,
- 6) For quantitative requirements, the actual predicted or achieved performance and the margin over the requirement,
- 7) Link to the verification data that justifies the compliance and the quantitative value (document, page and paragraph),
- 8) Comments, for example on plans to rectify non-compliances.

SPRP Statement of Work (SOW)

DID-0217 – Technology Readiness with TRRA Worksheets and Rollup**PURPOSE:**

Referring to RD1, the Technology Readiness and Risk Assessment (TRRA) describes in a systematic and objective fashion the technological readiness of a system for a particular spaceflight mission or environment, the criticality of the constituent technologies, and the expected degree of difficulty to achieve the remaining technology development steps.

The TRRA provides for all the Critical Technology Elements (CTE) of the proposed concept, as per the Product Breakdown Structure (PBS), a high-level summary of the maturity of the technologies and the technology development risks.

Agreement on the appropriate PBS level and identification of the CTE is required prior to the TRRA.

PREPARATION INSTRUCTIONS:

The TRRA must be done in accordance with the CSA Technology Readiness and Risk Assessment Guidelines (RD1) using the worksheet (RD3) for each CTE and rollup using (RD4). A summary of the TRRA assessment and recommendations must be included in the final Project Report (CDRL 6).

SPRP Statement of Work (SOW)

DID-0218 – Technology Roadmap Worksheet**PURPOSE:**

The Technology Roadmap provides an overview of the required technology developments to meet mission needs and the plan and timeline to reach TRL 6 and 8.

PREPARATION INSTRUCTIONS:

The TRM must be done using RD3.

SPRP Statement of Work (SOW)

DID-0225 – Performance Evaluation Criteria (PEC)**PURPOSE:**

To show the current performance expectations of the system with respect to key performance and resource parameters, and the comparison of current predictions versus the defined requirements.

PREPARATION INSTRUCTIONS:

The PEC report must show a history of changes, and must highlight the changes since the last issue. The PEC report must show the decomposition of the PEC requirements into allocations for subsystems and different resources and should follow the Product Tree. Similarly the report must show the parallel roll-up of current estimates for the PEC values.

The PEC report must show:

- a) Physical resources of mass, power (steady-state and transient peaks), volume;
- b) System specific performance criteria and parameters as applicable (e.g. computer resources, communications bandwidth, thermal limits).
- c) The historic trend of requirements and estimates,
- d) All the margins being carried on the estimates, and
- e) The source of the estimates (e.g. allocation, estimation, analysis, measurement).

SPRP Statement of Work (SOW)

DID-0236 – Engineering Models and Analyses**PURPOSE:**

To support the design, establish feasibility of the design to meet the requirements in the design phases, and in some cases provide verification of compliance to requirements where this cannot be demonstrated directly by test or inspection.

PREPARATION INSTRUCTIONS:***GENERIC FORMAT AND CONTENT FOR ALL ANALYSES***

All CAD models developed must be delivered as appropriate. Models must be delivered in the following formats:¹

- f) Mechanical design: STEP AP203 (.stp)
- g) Electrical design: .dsn, .sch, Pspice and Gerber formats
- h) Software design: UML 2.0 or XML (Extensible Markup Language)

In cases where a different tool is used from the one CSA uses, the model and outputs must be supplied in native format in addition to the required format. For generic modeling and analyses that don't use a specialty tool, CSA will accept Matlab, Excel and MathCad format data. Where a highly specialized tool is used, the delivery format must be negotiated with the TA. Translation from the Contractor's tool to the required format is only acceptable where the results can be repeated in CSA's tool. Translation that corrupts the model, loses data, or produces data that is interpreted differently, is not acceptable.

Analysis documents must contain all analysis work that is performed in support of the design. The analysis material must be sufficiently detailed so that, in combination with the delivered models, CSA or an external reviewer can reproduce the results. The analysis must establish feasibility and verification of the design to meet the requirements.

The data must include references to sources such as equations, material values, parameters and properties.

Each report must contain the following information, as a minimum:

- 1) Objectives of the analysis;
- 2) Reference to the relevant requirements;
- 3) Description of the analysis tools used;
- 4) Description of the model developed to aid the model user (if applicable);
- 5) Identification of the assumption(s) made;
- 6) Description of the main analysis steps and intermediate results;
- 7) Results of the analysis and compatibility with the requirements;
- 8) Identification of potential problem areas and presentation of alternative design solutions; and
- 9) Conclusion.

Delivered models must contain at least example outputs so that the user can check their function, and should contain the main outputs used in the analysis documents.

¹ All 2-D drawings must be submitted in PDF format, with the capability to zoom

SPRP Statement of Work (SOW)

DID-0260 – Design Document**PURPOSE:**

To describe the features and capabilities of the item as designed. The item could be a system or subsystem.

PREPARATION INSTRUCTIONS:

The Design Document acts as an “answer” to the Requirements Document for the system or subsystem: the requirements state what is needed, and the Design Document describes what is provided to meet these needs. The Design Document serves as the main reference text for users after delivery of the item, describing the full range of performance and functional capabilities of the item, as verified during the test/verification program.¹

Each document must contain, as a minimum:

- 1) Scope
 - a) System Overview
 - b) Document Overview
- 2) System Design
 - a) Functional Block Diagram
 - b) External Interfaces
 - c) Subsystems descriptions
 - d) Internal Interfaces
 - e) Functional description
- 3) Mechanical description
- 4) Electrical description
- 5) Operating modes and states
- 6) Environmental considerations derived from the environment requirements as specified in this SOW.
- 7) Acronyms

¹ All 2-D drawings must be submitted in PDF format, with the capability to zoom

SPRP Statement of Work (SOW)

DID-0262 – Verification Plan**PURPOSE:**

The verification process is defined by the Verification Plan. The plan also defines the planning policies, methods of controls, and organizational responsibilities. From the Verification Plan, the verification procedures are developed. The procedures provide the instruction, including configurations, constraints, and prerequisites, for obtaining data that show compliance with the requirements.

PREPARATION INSTRUCTIONS:

The Verification Plan must:

- 1) define the verification activities that will prove that the system and subsystems meet the all the imposed requirements including functional, performance, interface, environmental, etc.,
- 2) define all verification activities at each phase of the project, including test, analysis, and inspection,
- 3) describe the methods and techniques to be used to measure, evaluate, and verify the system. This is to include characterization of the system behaviour that is not controlled by requirements but is important for understanding of the system, and establishing the actual values of parameters that exceed requirements,
- 4) use an appropriate combination of simulation and analytical tools, mock-ups, laboratory models, engineering models and prototype models,
- 5) define the requirements for supporting facilities, analysis tools and test equipment, both existing and needing to be constructed. Assumptions on the use of Government-Furnished Equipment (GFE) in testing are to be documented, including:
 - a) the specific equipment and materials needed,
 - b) the configuration of the equipment to be used,
 - c) any requirements on modification or upgrade of the GFE,
 - d) the location in which it is to be used,
- 6) define the schedule for verification activities and the schedule requirements for the Government furnished facilities (e.g. David Florida Laboratory).

Requirements on GFE must be highlighted or summarized so that an integrated request can be given to the provider.

For each defined test and analysis activity, the plan must contain:

- 1) a description of the activity,
- 2) the objective, including requirements to be verified,
- 3) supporting hardware and software,
- 4) assumptions and constraints that apply to the activity,
- 5) plans to install, setup, and maintain items in the test or analysis environment,
- 6) a description of the data recording, reduction, and analysis activities to be carried out during and after the activity.

VERIFICATION METHODS DEFINITIONS

The verification program must be accomplished by employing one or more of the methods described in the following sub-sections.

Test

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Verification by test is the actual operation of the system, in clearly defined environmental conditions, to evaluate its performance.

Functional Tests

Functional testing is an individual test or series of electrical or mechanical performance test(s) conducted on the system's hardware and/or software at conditions equal to or less than design specifications. Its purpose is to establish that the system performs satisfactorily in accordance with design and performance specifications. Functional testing is generally performed at ambient conditions. Functional testing is performed before and after each environmental test or major move in order to verify system performance prior to the next test/operation.

Environmental Tests

Environmental testing is an individual or series of test(s) conducted on the system's hardware to ensure that the rover hardware must perform satisfactorily in an analog environment. Examples of environmental tests are vibration, acoustic, thermal, vacuum and EMC. Environmental testing may or may not be combined with functional testing depending on the objectives of the test.

Analysis

Verification by analysis is a process used in lieu of, or in addition to, testing to verify compliance to specification requirements. (e.g. stress, thermal, materials). The selected techniques may include systems engineering analysis (structural, environmental, electrical, etc.), statistics and qualitative analysis, computer and hardware simulations, and analog modelling.

Analysis may be used when it can be determined that:

- a) Rigorous and accurate analysis is possible;
- b) Test is not feasible or cost-effective;
- c) Similarity is not applicable; and
- d) Verification by inspection is not adequate.

Demonstration

Verification by demonstration is the use of actual demonstration techniques in conjunction with requirements such as serviceability, accessibility, transportability and human engineering features. In general, demonstration is specified as the method of verification for physical attributes which have no numerical requirements associated with them. This includes qualitative features such as comfort, accessibility, suitability and adequacy. Demonstration may also be specified for presence or compatibility of shipping containers, handling fixtures, etc.

Inspection

Verification by inspection is the physical evaluation of equipment and associated documentation to verify design features. Inspection is used to verify construction features, workmanship, dimensions and physical condition, such as cleanliness, surface finish and locking hardware. Often inspections are conducted in conjunction with a test or as part of assembly operations documented by manufacturing instructions (MIS).

Validation of Records

Validation of records is the process of using manufacturing records at end-item acceptance to verify construction features and processes for the system hardware. Verification of records is specified whenever it is necessary to compare two or more documents to each other in order to assess compliance with a requirement. Common examples of the way verification of records is used include:

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- a) Examining drawings for features required by specifications;
- b) Examining parts lists for ESD sensitive components;
- c) Comparing two or more drawings to assess a mechanical interface;
- d) Checking personnel records for proper training;
- e) Checking facilities records for environmental exposure;
- f) Examining vendor data supplied with parts or materials; and
- g) Verification that analyses meet safety specifications.

Similarity

Verification by similarity is the process of assessing by review of prior test data or hardware configuration and applications that the article is similar or identical in design and manufacturing process to another article that has previously been qualified to equivalent or more stringent specifications.

Review of Design Documentation

Verification by review of design documentation is the process of reviewing the design against the requirements, which as stated may or may not contain specifics to be met by a test, analysis, etc. but must be present in the design. This method is used during the preliminary design and critical design reviews of the development phase.

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DID-0263 – Version Description Document (VDD)**PURPOSE:**

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

PREPARATION INSTRUCTIONS:

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

- 1) Version Description
 - a) Inventory
 - i) CSCI Source File Listing
 - ii) Documentation. This section must list all relevant documents revisions associated with this build version (requirements, ICDs,...)
 - b) 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.
- 2) Version Description - Support Items
 - a) Hardware Tools
 - b) Development Platform Hardware Requirements
 - c) Software Tools
 - d) Build Procedures and Development Environment Setup Information. The procedure must provide step-by-step actions with screen shots whereas appropriate to document the complete build process.
 - e) Installation Procedures
 - f) Validation Test Scripts, Data and Results
- 3) Known Errors and Possible Problems
- 4) Notes

SPRP Statement of Work (SOW)

DID-0280 – Test Procedure**PURPOSE:**

To define the procedure to be followed for each test to be performed.

PREPARATION INSTRUCTIONS:

This DID is applicable to systems, hardware and software.

The test procedures must contain the following information, as a minimum:

1. SCOPE

This section must include a brief description of the test and the objectives of the test.

2. TEST REQUIREMENTS

This section must define the measurements and evaluations to be performed by the test.

3. TEST ARTICLE

This section must define in detail the test article configuration that is to be tested.

4. TEST FACILITIES

This section must identify the test facilities to be used, including their physical location, coordinates and contact points.

5. PARTICIPANTS REQUIRED

This section must provide a listing of the individuals (position titles, trade or profession) required to conduct or witness the test.

6. TEST SET-UP AND CONDITIONS

This section must include description/sketches of test articles in test configuration illustrating all interfacing test/support equipment. Instrumentation/functional logic must be shown where applicable. The section must include any environmental and cleanliness requirements.

7. INSTRUMENTATION, TEST EQUIPMENT AND TEST SOFTWARE

This section must provide a listing of the instrumentation, test equipment and software that is to be used during the test.

8. PROCEDURE

This section must define the step-by-step procedure to be followed, starting with the inspection of the test article, and describing the conduct of the test up to and including post-test inspection. Each test activity must be defined in sequence and task-by-task, including test levels to be used and measurements/recordings to be made. It must include any necessary malfunction and abort procedure.

9. DATA ANALYSIS

This section must define the methods to be used in the analysis of the results, along with the uncertainty range in the results. Data presentation format must be defined.

10. ACCEPTANCE/REJECTION CRITERIA TABLE

This section must provide data sheets needed during execution of the test specifying acceptance/rejection criteria, including identification of the associated requirements from the Requirements Documents or Specifications. These sheets will be in a tabular form allowing columns for measured values and deviations to be recorded. A computer printout generated by test software

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is acceptable provided it supplies the same information, however the test criteria must be stated in the Test Procedure.

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DID-0285 – Test Report**PURPOSE:**

To document the results of all tests done on a hardware unit or software CSCI.

PREPARATION INSTRUCTIONS:

This DID is applicable to systems, hardware and software.

The test report must document all tests performed to verify that the unit or software will meet the functional and operational requirements specified in the Requirements Documents or Specifications applicable to the unit.

The Test Report must contain, the following information, as a minimum:

1. APPLICABLE DOCUMENTS

This section must include test procedures and system requirements/specifications being tested.

2. TEST ARTICLE OR SYSTEM UNDER TEST:

This section must define in detail the test article configuration tested.

3. PURPOSE:

This section must describe the purpose of the test and the specific requirements/specifications that it is intended to verify.

4. SUMMARY OF TEST RESULTS

This section must present a summary of test results, including non-conformances, where applicable.

5. TEST FACILITIES

This section must identify the test facilities used, including their physical location, coordinates and contact points.

6. TEST SET-UP AND CONDITIONS:

This section must include descriptions/photos/sketches of test articles in test configuration illustrating all interfacing test/support equipment. Instrumentation/functional logic must be shown where applicable. The section must describe the environmental and cleanliness conditions present, as well as operating conditions (e.g. supply voltage).

7. INSTRUMENTATION, TEST EQUIPMENT AND TEST SOFTWARE:

This section must provide a listing of the instrumentation, test equipment and software used during the test.

8. DETAILED TEST RESULTS:

This section must record actual test data obtained on tabular sheets prepared in the Test Procedure (or software-generated) during the test performance, and deviations from the criteria.

9. TEST DATA ANALYSIS:

This section must document analyses required to relate the detailed results to the requirements to be verified.

10. NON-CONFORMANCES:

This section will provide all Non-Conformance Reports generated during the tests. The Non-Conformance Reports will be dated and stipulate the latest dispositions.

11. CONCLUSIONS AND RECOMMENDATIONS:

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This section must identify deficiencies, limitations or constraints and propose alternative design solutions to be evaluated in order to resolve problems encountered in testing.

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DID-0301 – Operating Procedures and Users Guide

PURPOSE:

To provide detailed step-by-step procedures and guidance for the operation of the system (payload or rover). In the case of the rover, this must include procedures for the rover by itself as well as when integrated.

PREPARATION INSTRUCTIONS:

General Requirements

The Operating Procedures and Users Guide must be provided in Microsoft Word. Drawings and pictures must be included in these Word documents, not in separate documents.

The Operating Procedures and Users Guide must contain an appendix that analyses End-to-End Operations Workflow, including the real-time operations as well as the offline pre-and post-missions analysis work and the operator training process, including training session preparation, execution and the use of tools to evaluate operator performance and achieve their certification.

The Users' Guide must contain the following information:

- 1) Description and principles of operation, including configuration for:
 - a) Transportation
 - b) Field Deployments (if different)
- 2) Assembly procedure (if required):

NOTE: this is internal to a rover or a payload, NOT the installation of a payload on a rover; the latter is to be presented in the Integration Procedures.

 - a) Mechanical Interfaces (including cooling/heating connections)
 - b) Electrical Interfaces
 - c) Command and Data Handling (C&DH) Interfaces
 - d) Scenario Setup Instructions (software & hardware)
 - e) Scenario Analysis Instructions
- 3) Disassembly procedure
- 4) Operational modes
- 5) Operational procedures:
 - a) Identification of all operations for which the system was designed
 - b) Specification of all constraints pertinent to each procedure, with references to technical documents for justification
 - c) Power On/Off and initiation of the software and termination of system operation
 - d) Calibration
 - e) Routine operating procedures
 - f) Monitoring of the operation of the system including: fault identification, evaluation, and conditions requiring computer shutdown
 - g) Detection, analysis and correction of anomalous behaviour
 - h) References to baseline configuration database for each parameter used in each procedure
 - i) Operating rules
- 6) C&DH Procedures
 - a) Methods of commanding the system and/or experiment (computer, manual, other)
 - b) Methods of collecting and disposing of H&S data

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7) Software User Procedure

- a) information and user instructions necessary for user interaction with the CSCI(s) including:
 - i) step-by-step operating procedures, including the use of all pre and post missions analyses tools, and operator training, evaluation and certification tools,
 - ii) identification of all options available to the user,
 - iii) initialization procedures,
 - iv) required user inputs and options,
 - v) identification and description of system inputs and effects on user interface,
 - vi) termination methods and indicators,
 - vii) restart procedures, and
 - viii) expected outputs.
- b) a listing of all error messages including definition and action to be taken.

8) Maintenance Procedures and Troubleshooting

- a) Recovery from faults or interrupts including restart and the collection of information concerning the fault
- b) Description of diagnostic features available to the operator of the system including: available tools, and step-by-step diagnostic procedures
- c) Trouble-shooting table
- d) Periodic maintenance required, including tasks and frequencies
- e) Test equipment and special tools required

Operational Data Base

The Operational Data Base (ODB) must contain definitions for the following data:

- 1) Telemetry database format;
- 2) Telecommand database format;
- 3) System (rover or payload) Baseline Configuration:
 - a) Definition of all parameters determining on-board database configuration at any time, including conversions and constraints, as installed in real-time, planning, and analysis platforms;
- 4) Remote Control Station (RCS) Baseline Configuration:
 - a) Definition of all parameters determining the RCS database configuration at any time, including conversions and constraints;
 - b) Values of all system (rover or payload) related parameters in the ODB pertinent to procedure execution and on-board system maintenance;
 - c) Constraints on telemetry values for status and health verification; and
 - d) Software configuration status for the system (rover or payload) and the RCS.

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APPENDIX B ACRONYMS

| | |
|--------|--|
| ACA | After Contract Award |
| AD | Applicable Document |
| AI | Action Item |
| AIL | Action Item Log |
| AIT | Assembly, Integration and Test |
| AR | Acceptance Review |
| BIP | Background Intellectual Property |
| C&DH | Command and Data Handling |
| CDR | Critical Design Review |
| CDRL | Contract Data Requirements List |
| CM | Configuration Management |
| COTS | Commercial-Off-The-Shelf |
| CSA | Canadian Space Agency |
| CSCI | Configuration Software Configuration Item |
| CTE | Critical Technology Element |
| CWBS | Contract Work Breakdown Structure |
| DID | Data Item Description |
| EIDP | End Item Data Package |
| EM | Engineering Model |
| ESM | Exploration Surface Mobility |
| EV | Earned Value |
| ExCore | Exploration Core |
| FIP | Foreground Intellectual Property |
| FPGA | Field Programmable Gate Array |
| GES | Global Exploration Strategy |
| GFE | Government Furnished Equipment |
| GSE | Ground Support Equipment |
| ICD | Interface Control Document |
| ISECG | International Space Exploration Coordination Group |
| ISRU | In-Situ Resources Utilization |
| KOM | Kick-off Meeting |
| LIDaR | Laser Imaging, Detection and Ranging |
| NASA | National Aeronautics and Space Administration |
| NGC | Next Generation Canadarm |

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| | |
|---------|---|
| ODB | Operational Data Base |
| OPI | Office of Prime Interest |
| PA | Product Assurance |
| PBS | Product Breakdown Structure |
| PDF | Portable Document Format |
| PEC | Performance Evaluation Criteria |
| PSR | Permanently Shadowed Regions |
| PWGSC | Public Works and General Services Canada |
| RCS | Remote Control Station |
| RD | Reference Document |
| RESOLVE | Regolith and Environment Science and Oxygen and Lunar Volatile Extraction |
| RP | Resource Prospector |
| RPM | Resource Prospector Mission |
| S&PA | Safety and Product Assurance |
| SATS | Sample Acquisition and Transfer System |
| SCD | Source Control Drawing |
| SOW | Statement of Work |
| SPI | Schedule Performance Index |
| SV | Schedule Variance |
| TA | Technical Authority |
| TBC | To Be Confirmed |
| TBD | To Be Determined |
| TRB | Test Review Board |
| TRL | Technology Readiness Level |
| TRM | Technology Roadmap |
| TRR | Test Readiness Review |
| TRRA | Technology Readiness and Risk Assessment |
| VCM | Verification Compliance Matrix |
| VDD | Version Description Document |
| WBS | Work Breakdown Structure |
| WPD | Work Package Description |

ANNEX C

TECHNICAL AND MANAGERIAL BID PREPARATION INSTRUCTIONS

C.1 TECHNICAL AND MANAGERIAL BID

The details provided in this Attachment complement the information introduced in Part 3 - Bid Preparation Instructions of the Request for Proposal.

The Bidder should present the information about the Technical and Managerial Bid in the following order:

1. Title / Project Identification Page (see C.2);
2. Executive Summary (see C.3);
3. Table of Contents (see C.4);
4. Technical Relevance (see C.5);
5. Technical Section (see C.6);
6. Managerial Section (see C.7);
7. Bid Appendices (see C.8).

The structure of the Technical and Managerial Bid, and its subsections, are described below. Some of the subsection headings are followed by numbers in brackets. These numbers represent the Evaluation Criteria (see Table D.1 of Annex D) that are applicable to that specific section/subsection for each bid submitted by a Bidder.

C.2 TITLE/PROJECT IDENTIFICATION PAGE

The first page of the bid submitted should state the following information.

- a) The Request For Proposal file number ;
- b) The company's name and address;
- c) The title of the proposed Work (the use of acronyms in the title is discouraged, unless they are described);
- d) The current and targeted TRL (up to TRL 6) of the proposed technology (refer to Annex A).

C.3 EXECUTIVE SUMMARY

The Bidder must provide an Executive Summary. The Executive Summary is a stand-alone document suitable for public dissemination, for example, through the CSA web site. The Executive Summary should not exceed two pages in length (8.5" x 11") and should highlight the following elements:

- a) Work objectives;
- b) Main innovations;
- c) TRL development;
- d) Technical risks;
- e) Major milestones and deliverables; and
- f) Impact on the proposed technology and the associated targeted Future Mission(s).

The Bidder should provide the Executive Summary in Soft copy with the only acceptable format: MS Word, WordPerfect, PDF or HTML in a separate file and not contain any proprietary markings.

C.4 TABLE OF CONTENTS

The table of contents should be formatted such that its headings are linked to their respective location in the bid for ease of reference when using the bid's Soft copy version.

C.5 TECHNICAL RELEVANCE

C.5.1 Relevance of the technology (Evaluation Criterion 1)

(Section D3.1 Criterion 1 – Technical Relevance in Annex D)

The criterion assesses the degree of relevance, which the proposed Work has with respect to CSA's objectives expressed in the SOW and positioning for future mission opportunities. More specifically, this criterion assesses the degree to which the bid exhibits an understanding of the stated performance and functional requirements and explains how the proposed technology will contribute to meeting these requirements.

The Bidder should address and substantiate the relevance of the proposed technology to the requirements in the SOW and the Applicable Requirements Document(s). The Bidder should show how the performance and functional characteristics being sought will be addressed by his proposal and how it will satisfy the needs of Canada and its stakeholders.

C.6 TECHNICAL SECTION

The Technical Section should describe the technical aspects of the project as outlined in the following subsections.

C.6.1 Team Technical Experience and Capacity (Evaluation Criterion 2)

(Section D3.2 Criterion 2 – Team Technical Experience and Capacity in Annex D)

This criterion assesses the combined technical capability and experience of the team assembled to carry out the Work. In order to do the assessment, the bidder should demonstrate capabilities and experience in developing technologies and engineering development of similar technology and comparable score and complexity to the Work detailed in Annex A. This should be demonstrated through examples of previous successful projects, clearly identifying the technologies that were developed, the engineering development that was performed, the similarity to the technologies addressed by this RFP, and the level of complexity that was involved, again compared to the requirements of this RFP. The Bidder should provide examples of especially difficult problems that had to be resolved.

C.6.2 Understanding the Technology (Evaluation Criterion 3)

(Section D3.3 Criterion 3 Understanding the Technology in Annex D)

The Bidder should demonstrate in his proposal that this criterion assesses the degree to which the bid exhibits an understanding of the fundamental concepts and trade-offs on the needs of the technology and of the proposed application as they relate to the activity proposed. In order to do the assessment, a concise statement of the technical objectives of the Work, both in terms of its functionality and performance is to be provided. Also, a description of the proposed technology must be provided, including a description of the overall problem, an overview of the background context, such as results of literature searches, prior development, state-of-the-art, and a description of the expected improvement, results and benefits, based on the technical objectives described in Annex A.

C.6.3 Technical Methodology (Evaluation Criterion 4)

(Section D3.4 Criterion 4 Technical Methodology Criterion in Annex D)

For this criterion, the Bidder should provide an overview of the technical methodology and its correlation with the main activities of the work-plan. The methodology outlined should describe how the Work would be conducted through the utilisation of analytical methods, procedures, techniques, industry standards, best practices and the state-of-the-art for pertinent disciplines, such as “value engineering.” The methodology should clearly demonstrate maturation of the particular technology in terms of TRL and define conditions and criteria, pertinent to the technology in question, which should be met at each TRL level covered by the bid.

The Bidder should also elaborate on and substantiate the proposed methodology while making references to the main activities of the work-plan described in the body of the bid and appearing in the Work Breakdown Structure (WBS), (see paragraph C.7.4 in Annex C). The effectiveness of the methodology and its correlation to the work-plan should be explained and substantiated.

The methodology and the corresponding work-plan should take in consideration the Technical Risk Assessment/Analysis (see paragraph C.6.4 in Annex C). The Bidder should also outline the software development environment and methodology already in place (e.g., use of CASE tools, standards, quality assurance, etc.). The methodology being employed should include any of the relevant issues that could potentially affect the progression of the work-plan. As an example, the availability of equipment, facilities and infrastructure to support successful progression of the Work should be provided here.

C.6.4 Technical Risk Assessment/Analysis

In the Technical Risk Assessment/Analysis subsection, the bidder should provide an assessment of the technical risks/uncertainties involved as well as the major assumptions upon which the work is based. In particular, this subsection should address any performance risks that pertain to the new technology. The risks should be identified and a Risk Mitigation Plan, which would include contingency plans, alternatives or other means of limiting adverse impacts of risks being realized, should be provided. As a guideline, Table C-1 presents a fictitious example of a Technical Risk Assessment Matrix, while Table C-2 presents an example of a Project Risk Profile Matrix.

| Risk Event 1 (R1) | Limited availability of key documents | |
|------------------------|---|---|
| Probability | Low | 1/20 Past experience demonstrates important number of different sources for patents and articles covering this subject |
| Consequence to project | Low | \$5 000 - \$10 000 Cost growth Schedule delays |
| Risk Assessment | Low | \$250 - \$500 (R < 5% of overall project value, \$250K) |
| Mitigation Plan | Secure at least 2 sources for each type of document | |

| | |
|------------------|-------------------|
| Contingency Plan | Use second source |
|------------------|-------------------|

Table C-1: Example of a Technical Risk Assessment Matrix

| Probability | | | |
|-------------|-------------|--------|------|
| High | | | R2 |
| Medium | | | |
| Low | R1 | | |
| | Low | Medium | High |
| | Consequence | | |

Table C-2: Project Risk Profile Matrix

It is understood that in order to develop advanced technologies, a certain amount of technical risk should be assumed. The more innovative the technology is, the higher the technical risk will generally be. The extent to which higher technical risks are acceptable depends upon how well they have been identified, defined, assessed, planned for, and managed once realized. If the technical risks are poorly defined, or the risk mitigation is inadequately planned, then the project's evaluation score is likely to diminish.

C.6.5 Performance Evaluation Criteria (PEC)

The Bidder should provide a list of objectively measurable or binary (yes/no) Performance Evaluation Criteria (PEC) for use as the foundation to evaluate the progress of the project and compare with the initial technical objectives. This list will be reviewed, updated if needed, and accepted by the CSA at the Kick-Off Meeting and at each Milestones/ Progress Meetings for upcoming Milestones/Progress Review Meetings. See Annex A, section A.6.2. The PEC will be used at the Work Authorization Meeting as a basis for a decision to proceed with the follow-on activities of the project.

C.7 MANAGERIAL SECTION

The Managerial Section should demonstrate the effectiveness and commitment of the Bidder in delivering the Work and the overall technology development up to its integration into the targeted Future Mission(s). Its subsections are Key Resource Management Experience, and Management Plan.

C.7.1 Key Resource Management Experience (Evaluation Criterion 5)

(Section D.3.5 Criterion 5 Key Resource Management Experience in Annex D)

The Bidder should identify his Project Manager for each bid he submits and outline his/her qualifications. The Bidder should identify the key members of the project's technical and management teams and state their specific qualifications and experience for the work involved. Detailed resumes must be provided in an Appendix to Section I of the bid. Names of back-up personnel for key positions should also be included.

This section should also outline the roles and responsibilities of all the proposed resources, as well as discuss and highlight the unique expertise they offer with respect to the capability of the team. The Bidder should include an organization chart that illustrates the structure of the proposed project team.

In the circumstances where sub-contractors resources are being proposed, the same requirements applicable to the prime contractor are applicable to the sub-contractors team(s).

C.7.2 Management Plan (Evaluation Criterion 6)

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection evaluates the Management Plan for its completeness and assesses its effectiveness in directing the project to a successful completion. Collaborative projects and/or projects led by University or Non-Profit Bidders should identify specific tasks and objectives related to an effective process for transfer of knowledge and technologies to industry. The IP management approach must be described. The Management Plan's presentation must be based on the recognized management tools most applicable to the proposed project, such as a scope planning (Work Breakdown Structure), and schedule development charts (Gantt, Program Evaluation and Review Technique -PERT, etc.). Equivalent Bidder-developed, project-tailored tools/charts are also acceptable, provided that the information is complete and comprehensive.

C.7.2.1 Bidder Background and Related Experience

This section should contain a concise overview of the Bidder's organisation. It should cover the following elements: the nature and structure of the Bidder's organisation; the level of Canadian ownership; the location, size and general description of the plant facility; the size and composition of staff; the principal product or field of endeavour; the annual business volume and general nature of the company's client base; and a list of any applications for funding from other Government sources and/or Government contracts received for similar and/or related work. This section should identify the location where the Work will be performed.

C.7.2.2 Work Breakdown Structure and Work Package Definition

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection should define and specify the scope of Work to be executed according to the requirements of the Statement of Work, Contract Deliverables and Meetings (Annex A). The Work Breakdown Structure (WBS) is a recognized scope definition technique, while Work Packages (WP) stem from the WBS. The WBS should flow down to a low enough level and the associated WP should be defined in sufficient depth in order for the Bidder to demonstrate the process that will be followed to perform the project.

Each WP should focus on specific activities that will form the total Work and, as a minimum, should define and describe the specific work to be carried out. It should also indicate: the person responsible, the WP's associated levels-of-effort and required resources, the schedule (start and finish dates), the risks, and the associated inputs and deliverable or output.

As a guideline, Figure C-1 presents a fictitious example of a WBS, while Table C-3 presents a fictitious example of a Work Package Definition Sheet. For each work packages the Bidder should provide a detailed statement of work and list the associated resources.

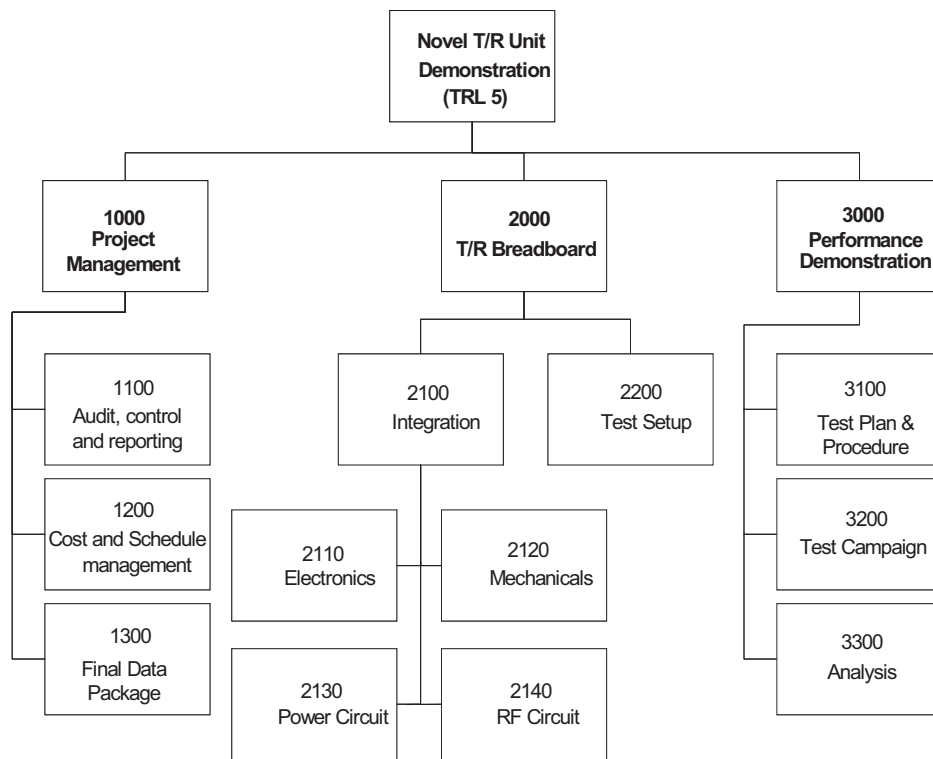


Figure C-1: Example of a Work Breakdown Structure

| | | |
|---|----------------------|---|
| Project: T/R Unit Demonstration | | |
| Work Pack Title: | TEST SETUP | WBS Ref: 2200 |
| Sheet: 1 of 1 | WP Estimated Value: | Do not indicate \$ value in Section I of the bid, indicate value only in Section II |
| Scheduled Start: T0 + 2 weeks | Accountable Manager: | Resource A |
| Scheduled End: T0 + 12 weeks | Resources: | Resource A Resource B Resource C |
| Estimated Effort: 80 hours | | |
| <u>Objectives:</u> | | |
| <ul style="list-style-type: none"> • Deliver a functional test setup for the T/R unit | | |
| <u>Inputs:</u> | | |
| <ul style="list-style-type: none"> • Test plan and procedure • Unit drawings • Unit Interface Control Documents | | |
| <u>Tasks:</u> | | |
| <ul style="list-style-type: none"> • Review input documentation • Define requirements • Produce initial concept • Design test setup • Fabricate test setup • Commission and debug | | |
| <u>Outputs and Deliverables:</u> | | |
| <ul style="list-style-type: none"> • Fully functional T/R unit test setup • Test setup log manual • Test setup user manual | | |

Table C-3: Example of Work Package Definition Sheet**C.7.2.3 Personnel Allocation**

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection should include a Responsibility Assignment Matrix (RAM) showing the level-of-effort for each individual team member that has been allocated to each WP. The matrix should identify each individual by name, and provide the estimated time (number of hours or days) required to complete each task. Also, the RAM should identify the role of the individual, either being the accountable person for the WP (A), or being a participant (P). As a guideline, Table C-4 presents a

fictitious example of a RAM. The RAM should be presented in both the technical bid and the financial bid.

| WBS Number | Work Package Title | Resource A | | Resource B | | Resource C | | Total |
|------------|--------------------|------------|-----|------------|-----|------------|-----|-------|
| 1.1 | Project Management | A | 200 | P | 25 | P | 25 | 250 |
| 1.2 | Literature Survey | A | 25 | P | 100 | - | 0 | 125 |
| 1.3 | Requirements | P | 50 | A | 100 | P | 100 | 250 |
| 1.4 | Design | P | 100 | A | 100 | P | 150 | 350 |
| 1.5 | Build | - | 0 | P | 200 | A | 150 | 350 |
| 1.6 | Test and Analysis | A | 100 | P | 200 | P | 200 | 500 |
| Total | | 475 | | 725 | | 625 | | 1825 |

Table C-4: Example of Responsibility Allocation Matrix (RAM)

P: Participant

A: Accountable

C.7.2.4 Managerial Risk Assessment

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection should provide an assessment of the managerial risks involved, provide a Risk Mitigation Plan and identify critical issues that may jeopardize the successful completion of the Work within cost and schedule constraints. As a guideline, Table C-5 presents a fictitious example of a Managerial Risk Assessment Matrix. Additionally, Table C-6 presents an example of a Project Risk Profile Matrix.

| Risk Event 2 (R2) | Late delivery of test equipment | |
|--------------------------|---|---|
| Probability | High | 1/3 Past experience with provider demonstrated poor respect of schedule |
| Consequence to project | High | \$110 000 (cost of securing optional test facility) Significant cost growth Significant schedule delays |
| Risk Assessment | High | \$55 000 High (R > 25% of overall project value) |
| Mitigation Plan | Identify and secure equivalent equipment in immediate geographical region Ensure equipment will be available for needed time frame Memo of understanding with facility key managers | |
| Response Plan | Secure equipment with MOU Confirm time frame options with facility | |

Table C-5: Example of a Managerial Risk Assessment Matrix

| Probability | | | |
|--------------------|--------------------|--------|------|
| High | | | R2 |
| Medium | | | |
| Low | R1 | | |
| | Low | Medium | High |
| | Consequence | | |

Table C-6: Example of a Project Risk Profile Matrix**C.7.2.5 Milestones and Deliverables**

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection should contain a definition of the milestones and describe in detail all expected deliverables, including hardware, software, and relevant documentation (refer to Annex A for more details). When appropriate, the milestones and deliverables should contain all elements identified in Table A-2 of Annex A and should relate to the corresponding WP definition in a manner enabling clear monitoring of progress (see table C-3).

C.7.2.6 Schedule

(Section D.3.6 Criterion 6 Management Plan in Annex D)

The Bidder should provide a project timetable that relates tasks, milestones and deliverables. A Gantt chart and/or PERT chart should be used to illustrate the schedule. The schedule should show significant details for events associated with achievement of major tasks, milestones and deliverables. The Bidder should demonstrate how required milestones will be met. Linkage between activities should also be identified in the schedule. For planning purposes, use a project start date of [Date].

C.7.2.7 Project Control System

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This Management Plan subsection should outline the methods and systems to be used to control tasks, schedules, and costs for the Work. The Contract Plan and Report Form (PWGSC-TPSGC 9143) can be substituted by another project management tool or a spreadsheet software package as long as it contains, as a minimum, the information required in the Contract Plan and Report Form (see following link for document: <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>). Additionally, the Project Control System should be capable of reporting the amount of work per WBS item for each individual on a monthly basis.

C.7.2.8 Background Intellectual Property and Foreground Intellectual Property

(Section D.3.6 Criterion 6 Management Plan in Annex D)

This subsection should identify and describe all Background Intellectual Property (BIP) that is required to conduct and/or support the Work and all Foreground Intellectual Property (FIP) expected to arise from the proposed Work. BIP and FIP elements should be described in sufficient detail so as to be clearly distinguishable. The expected format to provide this information is as per Table C-7 and Table C-8.

| BIP # | Title of the BIP | Types of IP (software algorithms, hardware design, patent) | Type of access to the BIP required to use/improve the FIP | Description of the BIP | Reference documentation (technical report, design document) | Origin of the BIP (internal R&D, project # or contract #) | Owner of the BIP (contractor, subcontractor) |
|-------|------------------|--|---|---------------------------|---|---|--|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Table C-7: Disclosure of Background Intellectual Property (BIP) expected to be required for the Contract

| FIP # | Title of FIP | Type of FIP (copyright, invention, design, software, know-how, trade secret...) | Description of the FIP | Reference documentation (technical report, design document) | Owner of the FIP (contractor, subcontractor, or the Canada) |
|-------|--------------|---|------------------------|--|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Table C-8: Disclosure of the Foreground Intellectual Property (FIP) expected to be developed under the Contract

The use of graphical representations that include block diagrams is encouraged in order to demonstrate the relationships between the various elements of the BIP and the FIP. The BIP and the expected FIP will be reviewed at the Kick-Off Meeting, and updated at each Review Meeting.

For each element of the BIP, this subsection should also specify:

- a) In what way the BIP element will be incorporated into the FIP;
- b) The type of access to each element of the BIP that is required in order to use, modify, improve and/or further develop the FIP; and
- c) The owner of the BIP.

Bidder's realizations that are software oriented and propose to improve upon existing software programs/applications will be required to provide the initial source code and associated documentation along with the final deliverables, unless the improvements can be clearly distinguished from the existing software (i.e., can be divided in different modules). In this case, the Interface Configuration Document (ICD) between the existing and new modules, and the executables of the existing module would be a deliverable. Similarly, projects that propose to improve upon existing hardware apparatus, fabrication or other processes will be required to provide current drawings, documentation and process descriptions along with the deliverables.

The Bidder should address and confirm the availability of all BIP elements to the CSA, in particular, if the final deliverables and the proof-of-concept demonstration require a special proprietary environment or tools for their operation. The Bidder will only be allowed to claim for costs associated with acquiring a research license for third-party BIP in order to conduct an assessment of such BIP to determine its usefulness to the technology being developed. The Bidder should acquire, at its own cost, a commercial license for any required third-party BIP. The acquisition of such a commercial license is strongly encouraged, although not paid for by the contract, as a demonstration of the Bidder's commitment to commercializing the FIP.

C.8 BID APPENDICES

C.8.1 Appendices Required with the Bid

The following item should be addressed in individual appendices as part of the bids:

- a) List of Acronyms: All the acronyms used in the Section I: Technical and Managerial Bid, should be explained;
- b) Resumes: The bid should include resumes of the proposed resources and these should be appended to Section I: Technical and Managerial Bid;
- c) Relevant Technical Papers Published by Team Members: Only literature that is relevant and that would be useful to support the bid;
- d) List of Contacts: The list of contacts should be appended to Section I: Technical and Managerial Bid, in a format suitable for distribution and should include all the Bidder's points-of-contacts involved in the bid development and/or during the Contract.

The following example format should be used:

| Role | Name | Telephone | Fax | E-Mail |
|---|-------------|------------------|------------|---------------|
| Project Manager | | | | |
| Project Engineers/Principal Investigator (PI) | | | | |
| Contractor's Representative | | | | |
| Claims(Invoicing) Officer | | | | |
| Communications (for press release) | | | | |
| Etc. | | | | |

Table C-9: Bidder's List of Contacts

If possible, and for the Project Authority ease of reference, the Bidder is also encouraged to include an electronic business card for each of the points-of-contact.

ANNEX D

POINT RATED EVALUATION CRITERIA

D.1 TECHNICAL AND MANAGEMENT CRITERIA AND RATINGS

To be responsive, the Bidder must achieve the minimum score requirements as indicated in Table D-1 "List of Evaluation Criteria and Associated Ratings". The bid will be evaluated according to the point-rated criteria as specified in Table D-1 and as described in section D.3 "Evaluation Criteria and Benchmark Statements".

The criteria are grouped under the following divisions:

- a) Technical Relevance Criterion;
- b) Technical Criteria ; and
- c) Management Criteria.

Section D.3 "Evaluation Criteria and Benchmark Statements" of the current attachment contains a series of evaluation criteria, each supported by a set of 5 benchmark statements (0, A, B, C, and D). Each of these statements has a corresponding relative value:

- 0 = 0% of the maximum point rating
- A = 25% of maximum point rating
- B = 50% of maximum point rating
- C = 75% of maximum point rating
- D = 100% of maximum point rating

As an example, the maximum point rating for the "*Team Technical Experience and Capacity*" criterion is 10 points. If a Bid receives a "C" for this criterion in the evaluation process, the score attributed will be:

75% of 10 points = 7.5 points (score)

Table D-1 identifies:

- a) The maximum point rating assigned to each criterion;
- b) The minimum point rating required for the "Technical Relevance" criterion;
- c) The maximum point rating possible for the overall score; and
- d) The minimum point rating required for the overall score.

Table D-1: - List of Evaluation Criteria and Associated Ratings

| Evaluation Criteria and Ratings | |
|---|----------------|
| | Ratings |
| Technical Relevance Criterion | |
| 1. Relevance of the technology | 15 |
| Minimum Score | 10 |
| Technical Criteria | |
| 2. Team Technical Experience and Capacity | 10 |
| 3. Understanding the Technology | 25 |
| 4. Technical Methodology | 25 |
| Minimum Score | N/A |
| Management Criteria | |
| 5. Key Resource Management Experience | 10 |
| 6. Management Plan | 15 |
| Minimum Score | N/A |
| | |
| Maximum Overall Score | 100 |
| Minimum Overall Score Requirement | 65 |

D.2 BIDDER'S CRITERIA SUBSTANTIATION

The Bidder is requested to provide a substantiation (supporting evidence), which should be submitted as an appendix to their Section I (see section C.8.1 "Appendices required with the bid" of Annex C: Technical and Managerial Bid Preparation Instruction).

For each of the applicable criteria, provide the substantiation and summarized cross-reference(s) to the bid.

The substantiation should 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 should be provided and the essence of the referenced information should be summarised in the substantiation.

For convenience, a Substantiation Table is provided in Table D.2 below. Enter each relevance/technical/management criterion section number, and the substantiation. It is expected that approximately half a page should be sufficient to make the Bidder's case for the rating chosen in the substantiation column.

Table D-2: - Substantiation Table

| Company: | |
|--|--|
| Project Title: | |
| CSA Exploration Core [Project name] | |
| Criteria | |
| Substantiation | |
| <i>Ex.: 1</i> <i>(criterion number)</i> | <i>Relevance of the technology It is expected that 300 words or so should be sufficient to make your case.</i> |
| | |
| | |
| | |

D.3 EVALUATION CRITERIA AND BENCHMARK STATEMENTS

The evaluation criteria benchmark statements are used by the evaluators as guidelines to justify their score. Bidders should use them to focus on the relevant information to be provided.

TECHNICAL RELEVANCE CRITERION

D.3.1 Criterion 1 Technical Relevance

This criterion assesses the degree of relevance which the proposed Work has with respect to CSA's objectives expressed in the SOW and positioning for future mission opportunities. More specifically, this criterion assesses the degree to which the bid exhibits an understanding of the stated performance and functional requirements and justification of the contribution of the proposed technology to meeting these requirements.

A minimum of 10 points are required for the bid to be considered compliant.

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|--|
| 0 | The bid does not address any of the technology being sought by CSA. |
| A | The bid addresses the technology requested in Annex A, but does not show an understanding of the driving needs nor does it demonstrate how the proposed technology will contribute to meeting the stated requirements. |
| B | The bid addresses the technology requested in Annex A, but either shows a poor understanding of the driving needs, or a vague demonstration of how the proposed technology will contribute to meeting the stated requirements. |
| C | The bid addresses the technology requested in Annex A, shows an overall understanding of the driving needs, and generally demonstrates contribution of the proposed Work to meeting the |

stated requirements. However, some details regarding the contribution of the proposed technology to meeting the overall requirements and/or the expected characteristics remain unclear.

- D The bid addresses the technology requested in Annex A, shows a complete grasp of the driving needs and its importance to Canada and its stakeholders, and demonstrates a solid understanding of the performance and functional characteristics being sought, as well as a clear link between the proposed technology and stated performance and functional expected requirements.

TECHNICAL CRITERIA

D.3.2 Criterion 2 Team Technical Experience and Capacity

This criterion assesses the combined technical capability and experience of the team assembled to carry out the Work.

The proposal substantiates that the technical team

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|-----------------------------|
|--------------|-----------------------------|

- | | |
|---|--|
| 0 | Has not demonstrated capability and experience with closely related technologies. |
| A | Has demonstrated limited capability and experience with closely related technologies. |
| B | Has demonstrated some capability and experience with closely related technologies but key capabilities are missing to form a comprehensive team. |
| C | Has worked actively with closely related technologies of comparable scope and complexity. The proposed team possesses all the capabilities required to perform the Work. |
| D | Is highly experienced in developing closely related technologies and in the related engineering development of similar technology of comparable scope and complexity. The proposed team possesses all the capabilities and experience required to perform the Work |

D.3.3 Criterion 3 Understanding the Technology

This criterion assesses the degree to which the bid exhibits an understanding of the fundamental concepts of the technology and of the proposed application as they relate to the research activity proposed.

The bid:

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|-----------------------------|
|--------------|-----------------------------|

- | | |
|---|---|
| 0 | Does not exhibit an understanding of the required concepts and/or of the associated applications. |
| A | Demonstrates only a limited understanding of the background or "state-of-the-art" of the technological concept(s) involved. |
| B | Demonstrates a general understanding of the state-of-the-art, includes a review of other work relevant to the concept, and explains why the proposed Work will lead to the expected results. |
| C | Demonstrates a detailed understanding of the state-of-the-art; includes a complete review of other work relevant to the central concept upon which the Work is based; and explains and provides some justification why the bid will lead to the expected results. |

-
- D Broadens the review of fundamental concepts and other work underlying the bid to explain the full capabilities of the technology and its application, analyses and convincingly justifies the feasibility of achieving the technical objectives and the expected results.

D.3.4 Criterion 4 Technical Methodology

This criterion assesses the suggested Technical Methodology and its correlation with the work-plan as presented in the bid. It also evaluates the effectiveness of the described Methodology in resolving the technical challenges, in attaining the stated technical objectives of the Work, and in meeting requirements of the Statement of Work (SOW) described in ANNEX A.

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|-----------------------------|
|--------------|-----------------------------|

- | | |
|---|---|
| 0 | The methodology described in the proposal does not demonstrate how it will address the stated objectives. |
| A | The methodology described in the proposal follows a weak methodical approach. |
| B | The methodology described in the proposal demonstrates a somewhat acceptable approach. However, the proposal does not substantiate the effectiveness of the methodology being employed for achieving the stated objectives. Conditions and criteria to be met for the targeted TRL are not defined. |
| C | The methodology as described in the proposal demonstrates a robust approach. The proposal substantiates the effectiveness of the methodology for achieving the stated objectives. Conditions and criteria to be met for the targeted TRL are defined. |
| D | The methodology described in the proposal is based on state of the art expertise and demonstrates a robust approach. The proposal substantiates the effectiveness of the methodology being employed for achieving the technical objectives of the Work. Conditions and criteria to be met for the targeted TRL level are well defined and elaborated. |

MANAGEMENT CRITERIA

D.3.5 Criterion 5 Key Resource Management Experience

This criterion assesses the qualifications and experience and past successes of the Project Manager and key project Scientists/Engineers identified to lead this proposal. Resumes requested to be appended to Section 1: Technical and Managerial Bid will be assessed for this criterion.

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|-----------------------------|
|--------------|-----------------------------|

- | | |
|---|---|
| 0 | The key project management team has not been identified or has no experience in successfully completing projects of similar scope, complexity and technology similar to that required for this proposal. |
| A | The key project management team does not have a proven track record of successfully completing projects of similar scope, complexity and technology similar to that required for this proposal. |
| B | The key project management team has a moderate track record of successfully executing projects of a scope, complexity and technology similar to that required for this proposal. |
| C | The Project Manager, Project Scientist(s) and Engineer(s) identified have a proven track record of success in executing and managing projects of a scope, complexity and technology similar to that required for this proposal. |
-

-
- D The Project Manager, Project Scientist(s) and Engineer(s) identified have a proven strong track record of success in completing projects on time, budget and performance of at least the scope, complexity and technology similar to that required for this proposal.

D.3.6 Criterion 6 Management Plan

This criterion evaluates the Management Plan for its completeness and also assesses its effectiveness in directing the contract to a successful completion. It also assesses the Bidder's IP management approach.

The bid:

| <u>Score</u> | <u>Benchmark Statements</u> |
|--------------|---|
| 0 | Has no concrete management plan and thereby instills no confidence that the selected team will bring the contract to its successful completion. |
| A | Does not provide an adequate Management Plan and more than one of the subsections of the Section C.7.2 (Management Plan) of Annex C of the RFP is not covered. Moreover, there is no BIP and/or FIP identified. |
| B | Provides an adequate Management Plan, including identification of BIP and FIP; however, some subsections of Section C.7.2 (Management Plan) of Annex C of the RFP are not covered. Consequently, the likelihood of delivering the proposed deliverables to the specified level of performance is not substantiated. |
| C | Provides a credible Management Plan and provides a reasonable, but not complete, BIP and FIP management approach. The plan's ability to effectively deliver on the projects requirements is demonstrated, but is somewhat limited because of lack of details. |
| D | Provides a coherent and comprehensive Management Plan. The plan's ability to effectively deliver on the project requirements is fully substantiated. A comprehensive IP management approach is provided. |