RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des soumissions - TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage , Phase III
Core 0A1 / Noyau 0A1
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

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
ORBITAL ANTENNAS (MEOSAR) PROJECT

Solicitation No. - N° de l'invitation	Date
W8474-12MS02/B	2012-12-28

Client Reference No. - N° de référence du client
W8474-12-MS01

GETS Reference No. - N° de référence de SEAG
PW-$$ST-005-25271

File No. - N° de dossier	CCC No./N° CCC - FMS No./N° VME
005st.W8474-12MS02	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2013-01-15

Time Zone
Fuseau horaire
Eastern Standard Time
EST

F.O.B. - F.A.B.
Plant-Usine: ☐ **Destination:** ☐ **Other-Autre:** ☐

Address Enquiries to: - Adresser toutes questions à:	Buyer Id - Id de l'acheteur
Chan, Alan	005st

Telephone No. - N° de téléphone	FAX No. - N° de FAX
(819) 956-1691 ( )	(819) 997-2229

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF NATIONAL DEFENCE
101 COLONEL BY DRIVE
ATT: DEBORAH TOLL
OTTAWA
Ontario
K1A0K2
Canada

Instructions: See Herein

Instructions: Voir aux présentes

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

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
See Herein	

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

Telephone No. - N° de téléphone
Facsimile No. - N° de télécopieur

Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)
Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

Issuing Office - Bureau de distribution
Science Procurement Directorate/Direction de l'acquisition de travaux scientifiques
11 Laurier St. / 11, rue Laurier
11C1, Place du Portage
Gatineau, Québec K1A 0S5

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Title: Medium Earth Orbit Search And Rescue (MEOSAR) - Experimental Medium Earth Orbit Local User Terminal (MEOLUT) Testbed for COSPAS-SARSAT Demonstration and Evaluation

PART 1 - GENERAL INFORMATION

1. Introduction

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

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

Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;

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

2. Debriefings

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

3. Summary

I. Requirement

The Department of National Defence has a requirement to purchase four (4) new Antennas to track the current MEO satellites that will be used in the Demonstration and Evaluation (D&E) phase of testing. These antennas will be installed at Communication Research Canada (CRC) and/or other nearby locations within the National Capital Region (NCR) at the discretion of the Department of National Defence (DND).

ii. Statement of Work

The Work to be performed is detailed in **Annex "A" -** *Statement of Work* attached to the “Resulting Contract” enclosed herewith.

III. Period of Contract

The period of any resulting contract will be from date of Contract to April 30, 2013.

iv Code of Conduct

Pursuant to section 01 of Standard Instructions 2003 and 2004, Bidders must submit a complete list of names of all individuals who are currently directors of the Bidder. Furthermore, as determined by the Special Investigations Directorate, Departmental Oversight Branch, each individual named on the list may be requested to complete a Consent to a Criminal Record Verification form.

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 (2012-07-11) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

The text under Subsection 4 of Section 01 - Code of Conduct and Certifications - Bid of 2003 referenced above is replaced by:

Bidders should provide, with their bid or promptly thereafter, a complete list of names of all individuals who are currently directors of the Bidder. If such a list has 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 provide such a list within the required time frame will render the bid non-responsive. Bidders must always submit the list of directors before contract award.

Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form - PWGSC-TPSGC 229) (http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaire-forms-eng.html) for any or all individuals named in the aforementioned list within a specified delay. Failure to provide such Consent Forms within the delay will result in the bid being declared non-responsive.

The text under Subsection 5 of Section 01 - Code of Conduct and Certifications - Bid of 2003 referenced above is replaced by:

The Bidder must diligently maintain the list up-to-date by informing Canada in writing of any change occurring during the validity period of the bid, and must also provide Canada, when requested, with the corresponding Consent Forms. The Bidder will also be required to diligently maintain the list and when requested, provide Consent Forms during the period of any contract arising from this bid solicitation.

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 to PWGSC will not be accepted.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than fourteen (14) calendar days before the bid closing date. Enquiries received after that time may not be answered.

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

4. Applicable Laws

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

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.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I : Technical Bid (3 hard copies) and 1 soft copy on CD

Section II : Financial Bid (2 hard copies) and 1 soft copy on CD

Section III: Certifications (1 hard copy)

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

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

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

(a) use 8.5 x 11 inch (216 mm x 279 mm) paper; and
(b) use a numbering system that corresponds to the bid solicitation.

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

(1) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and

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

Section I : Technical Management Bid

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

The technical bid should clearly address and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

In their management bid, bidders must describe their capability and experience, the project management team and provide client contact(s).

Section II : Financial Bid

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

(a) A firm, all inclusive lot price for the Work, The total amount of Goods and Services Tax or Harmonized Sales Tax is to be shown separately, if applicable

(b) For Canadian-based bidders, prices must be in Canadian funds, Canadian customs duties and excise taxes included, and Goods and Services Tax (GST) or Harmonized Sales Tax (HST) excluded.

For foreign-based bidders, prices must be in Canadian funds, Canadian customs duties and excise taxes and GST or HST excluded. Canadian customs duties and excise taxes payable by Canada will be added, for evaluation purposes only, to the prices submitted by foreign-based bidders.

For the purpose of the bid solicitation, bidders with an address in Canada are considered Canadian-based bidders and bidders with an address outside of Canada are considered foreign-based bidders.

1.1.1 Price Breakdown

Bidders are requested to detail the following elements for the performance of the Work, as applicable:

(a) Cost for the Antenna: A firm all inclusive price for the cost of each antenna (including spare) including shipping, Delivered Duty Paid (DDP)

(b) Installation:

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

(ii) Travel and Living Expenses : 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

(c) GST/HST : Identify any applicable GST or HST separately.

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, management and financial evaluation criteria.

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

1.1 Technical Evaluation

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

1.1.1 Mandatory Technical Criteria
Refer to Attachment 1, Mandatory and Point Rated Technical Criteria.

1.1.2 Point Rated Technical Criteria
Refer to Attachment 1, Mandatory and Point Rated Technical Criteria.

1.2.2 Evaluation of Price
SACC Manual Clause A0222T (2010-01-11), Evaluation of Price

2. Basis of Selection

2.1 Basis of Selection - Lowest Evaluated Price

To be declared responsive, a bid must:

(a) comply with all the requirements of the bid solicitation;

(b) meet all mandatory technical evaluation criteria;

(c) obtain the required minimum points overall for the technical evaluation criteria which are subject to point rating.

Bids not meeting (a) or (b) or (c) will be declared non-responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract. In the event that two or more responsive bids have the same lowest evaluated price, the responsive bid which obtained the highest number of points overall for the point rated technical evaluation criteria will be recommended for award of a contract.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications to be awarded a contract. Canada will declare a bid non-responsive if the required certifications are not completed and submitted as requested.

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

1. Code of Conduct Certifications - Certifications Required Precedent to Contract Award

1.1 Bidders should provide, with their bid or promptly thereafter, a complete list of names of all individuals who are currently directors of the Bidder. If such a list has not been received by the time the evaluation of bids is completed, the Contracting Authority will inform the Bidder of a time Frame within which to provide the information. Bidders must submit the list of directors before contract award, failure to provide such a list within the required time frame will render the bid non-responsive.

The Contracting Authority may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form - PWGSC-TPSGC 229) (http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html) for any or all individuals named in the aforementioned list within a specified delay. Failure to provide such Consent Forms within the delay will result in the bid being declared non-responsive.

PART 6 - RESULTING CONTRACT CLAUSES

1. Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex A.

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.

2010A (2012-11-19), General Conditions - Goods (Medium Complexity)

2.2 Supplemental General Conditions

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

4001 (2010-08-16), Hardware Purchase, Lease and Maintenance
4005 (2010-08-16), Telecommunications Services and Products

3. Term of Contract

3.1 Period of Contract

The period of the Contract is from date of Contract to March 31, 2013 inclusive.

4. Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Alan Chan
Supply Team Leader
Public Works and Government Services Canada
Acquisitions Branch
Science Procurement Directorate
Place du Portage, Phase III, 11C1
11 Laurier Street
Gatineau, Quebec
K1A 0S5

Telephone: 819-956-1691
Facsimile: 819-997-2229
E-mail address: alan.chan@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 Technical Authority

The Technical Authority for the Contract is:

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

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

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

4.3 Contractor's Representative

4.4 Inspection Authority

The Inspection Authority for the Contract is:

_____ (Name of Inspection Authority)
_____ (Title)
_____ (Department or Agency)
_____ (Address)

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

The Inspection Authority is the representative of the department or agency for whom the Work is being performed under the Contract and is responsible for inspection of the Work and acceptance of the finished work. The Inspection Authority may be represented on-site by a designated inspector and any other Government of Canada inspector who may from time to time be assigned in support of the designated Inspector.

5. Payment

5.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in the Contract for a cost of $ _____ **(insert the amount at contract award)**. Customs duties are excluded and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

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

5.2 Limitation of Price

SACC Manual Clause C6000C (2011-05-16), Limitation of Price

5.3 Method of Payment

5.3.1 Milestone Payments

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract if:

(a) an accurate and complete claim for payment using 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.

5.3.2 Schedule of Milestones

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

Bidder: Please fill in the milestone schedule below as part of the bid:

Milestone No.	Deliverable	Firm Amount	Delivery Date
1	Delivery of the first two Antennas		
2	Completion of installation of first two Antennas		
3	Delivery of the next two Antennas		
4	Completion of installation of the next two Antennas		

5.3.3 SACC Manual Clause H1001C (2008-05-12), Multiple Payments

5.4 SACC Manual Clauses

C2000C (2007-11-30), Taxes - Foreign-based Contractor
H4500C (2010-01-11), Lien - Section 427 of the *Bank Act*

6. Invoicing Instructions

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

   Each claim must show:

(a) all information required on form PWGSC-TPSGC 1111;

(b) all applicable information detailed under the section entitled “Invoice Submission” of the general conditions;

(c) the description and value of the milestone claimed as detailed in the Contract.

2. Goods and Services Tax (GST) or Harmonized Sales Tax (HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.

3. The Contractor must prepare and certify an original claim on Form PWGSC-TPSGC 1111, and forward it to the Contracting Authority for certification in an electronic format to the electronic mail address identified under section entitled "Authorities" of the Contract. Adobe Reader (.pdf) format is acceptable. The Contracting Authority will then forward the certified claim, in an electronic format, to the Technical Authority for appropriate certification after inspection and acceptance of the Work takes place, and onward submission to the Payment Office for the remaining certification and payment.

4. The Contractor must not submit claims until all work identified in this 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 entire contract period. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

8. 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 (2010-08-16), Hardware Purchase, Lease and Maintenance
(c) the supplemental general conditions 4005 (2010-08-16), Telecommunications Services and Products
(d) the general conditions 2010A (2012-11-19), General Conditions - Goods (Medium Complexity)
(e) Annex A, Statement of Work;

10. Defence Contract

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

11. Foreign Nationals (Foreign Contractor)

SACC Manual clause A2001C (2006-06-16), Foreign Nationals (Foreign Contractor)

12. Insurance

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

13 Shipping Terms

DDP (Communication Research Canada, 3701 Carling Ave, Ottawa, Ontario, Canada)

SACC Manual Clause D4001C (2008-12-12), Shipping Instructions - Delivery at Destination
SACC Manual Clause C2611C (2007-11-30), Customs Duties - Contractor Importer

DEPARTMENT OF NATIONAL DEFENCE
MEOSAR PROJECT

STATEMENT OF WORK FOR EXPERIMENTAL MEOLUT TESTBED FOR COSPAS-SARSAT DEMONSTRATION AND EVALUATION

Prepared by: Capt Léo Chaîné

Date: 12 December 2012

TABLE OF CONTENT

1 BACKGROUND

1.1 Cospas-Sarsat (C/S) is an international satellite-based search and rescue (SAR) distress alert detection and information distribution system established by Canada, France, U.S.A., and the former Soviet Union in 1979. The Cospas-Sarsat System provides distress alert and location information to SAR services throughout the world for maritime, aviation and land users in distress. The C/S system is moving to a Medium Earth Orbit (MEO) satellite system to replace the original Low Earth Orbit (LEO) satellite system. For Canada, this is the MEOSAR project. The project comprises two components or segments, i.e., a space segment and ground segment.

1.2 The ground segment consists of satellite ground terminals or land earth stations, known in the COSPAS-SARSAT context as Local User Terminals (LUTs), which track the MEOSAR satellites, and receive and process the transmissions of the distress radio beacons as relayed by those satellites. The MEOLUTs will be integrated into the existing Canadian Mission Control Centre (CMCC).

1.3 To determine the requirements and future capabilities of these LUTs needed to fulfill the MEOSAR project objectives, a C/S Demonstration and Evaluation (D&E) phase of testing will take place concurrently with the Options Analysis (OA) Phase of the MEOSAR project. To this end, a D&E test bed already established at the Communications Research Centre (CRC) Canada must be upgraded to meet the OA objectives and allow Canada to take part in the C/S D&E testing. Note that this test bed may also be used in subsequent phases of the MEOSAR project for the purposes of testing and troubleshooting; namely, in the Definition and the Implementation phases.

1.4 To meet the above, four (4) new antennas and all associated hardware (including spares) are needed to track the current MEO satellites that will be used in the D&E phase of testing. These antennas will be installed at CRC, by the Contractor, and/or other nearby locations within the National Capital Region (NCR) at the discretion of the Department of National Defence (DND). CRC and DND will ensure the selected contractor must meet the technical requirements and complete the installation as per the scope of this SOW.

2 OBJECTIVE

2.1 This main objective is the procurement, delivery, installation, and successful testing in the NCR of four (4) dish type antennas with Radio Frequency (RF) front ends and all associated hardware (including spares) that can track MEO satellites and receive C/S distress beacon signals relayed by the MEO search and rescue satellite repeaters for the purpose of performing C/S D&E testing and other testing for the OA phase of the MEOSAR project.

3 SCOPE

3.1 The scope of this requirement pertains to the procurement, delivery, installation, and successful testing of four (4) antennas and all associated hardware (including spare) that meet the objective stated in section 2. The contractor must deliver, assemble, install, successfully test on-site all the above antennas and associated hardware at required installation sites (CRC Canada and/or DND sites located in the NCR) in accordance with the applicable documents below.

4 APPLICABLE DOCUMENTS

4.1 Cospas-Sarsat 406 MHz MEOSAR Implementation Plan (R.012)

4.2 Demonstration and Evaluation Plan for the 406 MHz MEOSAR System (R.018)

4.3 Specification for Cospas-Sarsat 406 MHz Distress Beacons (T.001)

4.4 Cospas-Sarsat Local User Terminal Performance Specification and Design Guidelines (T.002)

4.5 Cospas-Sarsat LEOLUT Commissioning Standard (T.005)

4.6 Cospas-Sarsat 406 MHz Distress Beacon Type Approval Standard (T.007)

4.7 Cospas-Sarsat GEOLUT Performance Specification and Design Guidelines (T.009)

4.8 Cospas-Sarsat GEOLUT Commissioning Standard Description of the 406 MHz Payloads Used in the Cospas-Sarsat GEOSAR System (T.010)

4.9 Cospas-Sarsat 406 MHz Frequency Management Plan (T.012)

4.10 Cospas-Sarsat Frequency Requirements and Coordination Procedures (T.014)

Note: These documents can be accessed on the Cospas-Sarsat website:
http://cospas-sarsat.org/en/cospas-sarsat-documentation

5 CONSTRAINTS

5.1 Work will be done outdoors, with some antennas installed on towers (with built-in ladders).

5.2 Work must be performed within normal operational hours between 07:00 and 18:00 Eastern Standard Time.

5.3 Contractors will be accompanied by Government of Canada personnel at all times while on-site.

6 REQUIREMENTS

6.1 TECHNICAL REQUIREMENTS

6.1.1 General

6.1.1.1 The proposed antennas and associated hardware must be integrated into the current Front End signal processing system at CRC. Signals received by the antennas will need to be down converted to 4.5 MHz by the Contractor. Antenna systems must have:

6.1.1.1.1 Dual band (L-band and S-band) capability as per C/S applicable documents, and hardware and software needed to switch between bands.

6.1.1.1.2 Dual polarity capability, Left Hand Circular Polarization (LHCP) and Right Hand Circular Polarization (RHCP), and hardware and software needed to switch between polarities.

6.1.1.2 The proposed antennas must be controlled using a Front End Server (FES). The FES must delivered by the Contractor.

6.1.1.3 The proposed antennas must have capability to receive both L-band (1544-1555 MHz) and S-band (2226-2227 MHz) signals from both experimental and operational MEOSAR repeaters, track MEOSAR repeaters, and must have wide enough filtering to be able to receive signals anywhere within the L and S band ranges specified above.

6.1.1.4 The proposed antennas Gain over system noise Temperature (G/T) specification must be 10dB/K or higher at S-band and 7.5dB/K or higher at L-band. The measurement must be made at the demarcation point for the delivery of the signal from the satellite. This demarcation point will be identified by CRC Canada and may be located as far as 200 feet away from the base of the antenna pedestal.

6.1.1.5 The proposed antennas reflector size must be 2.4 meters +/- 0.1 meters.

6.1.1.6 Due to the harsh environment and the tracking of moving satellites for the above antennas, the whole antenna assembly must be pressurized to reduce corrosion and increase durability of mechanical motor and gear systems to handle temperatures as low as -35 Degrees Celsius. The gears must be packaged in cast housings and located inside a pressurized area to eliminate dust, moisture and other contaminants from gear grease; this will extend gear lubricant life and reduce maintenance issues beyond 5 years. Each antenna system assembly must have completely pressurized electrical cabinet, motor, and gear housings. Therefore, all antenna

positioner components including motors, brakes, encoders, Automatic Control Unit (ACU) electronics and cable systems must be pressurized to be protected from moisture thus reducing maintenance issues such as rusted brakes, and failed control systems.

6.1.1.7 Operational ambient temperature range of the antenna system must be: -35 Degrees Celsius to +50 Degrees Celsius.

6.1.1.8 Antennas and associated hardware must be able to operate, and allow the signal to be received and processed in accordance with applicable documents (C/S R.018), in sustained winds of up to 50km/h and gusts up to 85km/h.

6.1.1.9 The antennas and associated hardware must track MEO satellites, receive and decode the (LHCP and RHCP) signal, and display the Cospas-Sarsat Emergency Beacon on the Experimental MEOLUT Display. As a minimum the antennas and their associated hardware must be able to process and display the Cospas-Sarsat Emergency Reference Beacons from Toulouse (France), Edmonton (Alberta), Thule (Greenland), and NASA (Washington, DC) on the MEOLUT display.

6.1.2 The four (4) Antennas and associated hardware (including spares) should be delivered, installed and successfully tested at CRC Canada and/or DND sites located in the NCR by the 31 March 2013.

6.1.3 The Contractor should have technical experience in supplying and installing antennas, associated RF hardware, and tracking software for detecting, tracking and processing Cospas-SARSAT satellite repeater signals in S and L bands.

6.2 **Antenna positioner**

6.2.1 The antenna positioner must have internal humidity of antenna system monitored in electrical cabinet and in feed, to ensure condensing humidity is avoided, while keeping humidity levels between 20% to 90% which can create conditions for static charge damages and/or damage/degrade components.

6.2.2 Must have an ACU program that tracks LHCP and RHCP MEOSAR satellites (in both S and L-bands) automatically given ephemeris data Two-Line Elements (TLEs); and can close the tracking position loop at least 20 times per second.

6.2.3 Must have a “No Rust” guarantee on the lifetime of positioner.

6.2.4 Must have a cable wrap system in azimuth and elevation designed to last a minimum of 5 years.

6.2.5 Antenna positioner is either ”Conformité Européenne” (CE) marked, Underwriter Laboratory (UL) Listed or independently laboratory tested to ensure that electrical safety and RF

emissions testing meet recognized international standards. This is important for CRC/DND employee safety.

6.3 **Feed**

6.3.1 The Feed must have Dual polarity capability, Left Hand Circular Polarization (LHCP) and Right Hand Circular Polarization (RHCP), and hardware and software needed to switch between polarities**.** For Cospas-Sarsat purposes, the feed must be switchable for the same band to ensure better isolation with little degradation on Carrier-to-Noise Ratio (C/No.)

6.3.2 The system must provide full coverage of exactly the SARSAT L-band and experimental S-bands and utilize internal precision multi-pole cavity filters for each band (S and L) optimized for the SARSAT downlink frequencies.

6.3.3 The system must provide filtering to block RF interference from on-site local commercial and private mobile services, reducing the impact on the reception of the SARSAT emergency distress beacons relayed by satellite.

6.3.4 The Feed must have axial ratio of 2 dB or lower.

6.3.5 The Feed must use a purge valve that is automatically controlled by ACU to keep internal humidity of the feed at optimum levels.

6.4 **Master Local Oscillator (MLO)**

6.4.1 Output a SARSAT specific S-band and an L-band local oscillator signal phase locked to a 10 MHz reference.

6.4.2 Master local oscillator must provide low phase noise injection signals with target values as follows: (when locked to a 10 MHz GPS reference signal or equivalent for both S and L bands)

6.4.2.1 - 88 dBc/Hz (or a value less in dBc/Hz) @ 100 Hz offset
6.4.2.2 -118 dBc/Hz (or a value less in dBc/Hz) @ 1 KHz offset
6.4.2.3 -123 dBc/Hz (or a value less in dBc/Hz) @ 10 KHz offset
6.4.2.4 -128 dBc/Hz (or a value less in dBc/Hz) @ 100 KHz offset
6.4.2.5 -148 dBc/Hz (or a value less in dBc/Hz) @ 1 MHz offset

6.4.3 The MLO needs to be rack mountable for more temperature stable environment and for proximity to 10 MHz reference source.

6.5 **Dual band, dual channel digital downconverter (DDC)**

6.5.1 Be separately selectable to precisely cover the S and L band segments of Cospas-Sarsat and output at 4.5 MHz for both bands.

6.5.2 Be computer controlled to remotely switch bands, set conversion frequency, read signal levels, display current satellite being tracked and display input signal level in the selected Cospas-Sarsat passband.

6.5.3 Contain two (2) channels and can service two separate antennas with frequency band set independently for each channel.

6.5.4 Have extensive filtering to limit adjacent channel interference and provide a clean, low distortion signal to the digitizer.

6.5.5 Down convert to Intermediate Frequency (IF) at 4.5 MHz, bandwidth 0.5 MHz to feed into digitizer, to allow reception of new GLONASS and Galileo satellites.

6.5.6 Provide a second tap (output) at 4.5 MHz with same filtering as the original output, to allow reading of the signal by the CRC Spectrum Explorer spectrum monitoring system. This second tap cannot impact the 4.5 MHz main output into the digitizer.

6.5.7 Incorporates an Automatic Gain Control (AGC) to allow automatic or optional manual gain control to achieve a nominal +10 dBm output level.

6.5.8 Be indoor mounted for more temperature stable environment and for proximity to the MLO.

6.6 **SARSAT Front-End Server (FES)**

6.6.1 Must monitor and control at least four (4) antennas and associated downconverters simultaneously.

6.6.2 Have a status display (i.e. a screen or other electronic visual display unit) via a single monitoring point, so users can monitor all antenna hardware including the antenna positioners, feeds, ACUs, MLO, and DDCs.

6.6.3 Follow a tracking schedule of named satellites and automatically loads current ephemeris to each antenna and issues tracking commands to each antenna, automatically configures the feed polarity, and sets the appropriate channel of each downconverter to the correct band to match the tracking schedule in real-time.

6.6.4 Automatically collect current satellite ephemeris from reliable sources on the Internet and provides these TLEs to the antenna ACUs for tracking purposes.

6.6.5 Provide a central historical log of all setups for all system hardware to permit rapid diagnosis of system faults.

6.6.6 Provide a pass log for each satellite tracked. This is useful for rapid diagnosis of antenna tracking faults and data analysis for Cospas-Sarsat D&E testing.

6.6.7 Provide a comprehensive command line interface for accessing and testing all controlled components and configuration.

6.6.8 Provide an industry standard interface Simple Object Access Protocol (SOAP) (used for Microsoft systems) allowing remote software to control the SARSAT-FES without human intervention.

6.6.9 During installation, the Contractor should provide built-in automated Software/Hardware diagnostic tools for testing antenna performance parameters, including G/T tests and component simulation tools for software control integration testing.

6.6.10 Be indoor mounted for more temperature stable environment and for proximity to the timeserver.

7 TASKS/DELIVERABLES

7.1 The four (4) Antennas and associated hardware (including spares) should be delivered, installed, and successfully tested at CRC Canada and/or DND sites located in the NCR by the 31 March 2013. The Contractor must:

7.1.1 Configure and build the antennas and obtain all necessary antenna reflectors, feeds, positioners, mounting poles, pre-amp base, satellite tracking controllers including a Front End Server, Global Positioning System (GPS) antenna, oscillators, all necessary RF hardware, downconverters, and software toolkits for tracking and receiving Cospas-Sarsat distress beacon signals via MEOSAR satellite repeaters.

7.1.2 Prior to shipping, provide DND and/or CRC personnel with all required pre-installation guidelines to ensure installation site is ready to receive the antennas from the Task at paragraph 7.1.

7.1.3 Prior to shipping, interface with DND and/or CRC resources to ensure cabling lengths are adequate and connectors match so as to interface with the available Front End signal processing system location and housing.

7.1.4 Prior to shipping, send required resources to NCR DND/CRC site to confirm pre-installation preparations are completed and ensure that the site is ready for installation of antennas (i.e. the towers/ ground pads, power supplies etc.).

7.1.5 Complete Factory Acceptance Test (FAT) and Site Acceptance Test (SAT) as stated in section 8.

7.1.6 Deliver antennas to the NCR DND locations of choice within the NCR.

7.1.7 Provide all necessary resources, equipment, and parts to install antennas on available towers and/or ground pads including but not limited to:

7.1.7.1 Provide system cabling to the agreed vendor-customer interface locations and coaxial surge suppressors at the installation site for the antennas;

7.1.7.2 Provide mechanical hardware such as nuts/bolts, and tools to complete installation;

7.1.7.3 Provide and perform acceptance test procedures and resources to test and verify antenna installation and operation meet technical specifications as per relevant C/S technical documents and connect to the current Front End signal processing system at CRC so signals received can be decoded by the signal processors; and

7.1.7.4 Removal any scrap materials from the site that relate to the antenna installation (i.e. crates, left over cabling etc.), or any shipping materials that cannot be stored on-site.

7.1.8 Deliver spares as follows: ~~(should be delivered by 31 March 2013)~~

7.1.8.1 GPS Antenna kit with cable and mount.

7.1.8.2 Power Supply, 24V, DIN Mount.

7.1.8.3 Master Local Oscillator, SARSAT, Multi-Output S-L Band.

7.1.8.4 Feed, SARSAT, S-L Band, dual polarity.

7.1.8.5 Downconverter, Dual Channel, S-L Band, 4.5MHz out.

7.1.8.6 Antenna Controller Module, three (3) Printed Circuit Board (PCB) stack w/GPS.

7.1.8.7 Motor Drive Module, 2.4 AEHP.

7.1.8.8 Azimuth Encoder Limit Module.

7.1.8.9 Elevation Encoder Limit Module.

8 ACCEPTANCE CRITERIA

8.1 Factory Acceptance Test (FAT). The Contractor must provide FAT reports for all satellite communication terminals, or Certificates of Compliance in lieu. The FAT reports must verify the following Contractor's own specifications, as a minimum:

8.1.1 Antenna Gain over System Noise Temperature Ratio (G/T) at S-band and L-band at the output of the cable connected to the output of the DDC as described in section 6.1.1.4 above.

8.1.2 Dual Polarity Dual Channel capability as per section 6.3.1, 6.3.2, and 6.5.1.

8.1.3 RF Equipment (L-band/S-band) switching as per section 6.2, 6.4.1, 6.4.2, and 6.5.1.

8.1.4 CE Mark (or UL listed or independence Lab tested) for all RF hardware and positioners as per section 6.2.5.

8.1.5 Master Local Oscillator (MLO) Phase Noise as per paragraph 6.4.2.

8.2 Site Acceptance Test (SAT). This main objective is the procurement, delivery, and installation in the NCR of four (4) antennas and associated hardware as per section 6:

8.2.1 Satellite tracking of a LHCP and RHCP MEOSAR satellite (in both S and L-bands). The successful tracking of each type (LHCP and RHCP) and each band (S and L Band) of MEOSAR satellite shall result in the successful decoding of a distress type beacon signal as per C/S T.001.

8.2.2 Antenna monitoring and control.

8.2.3 RF Equipment (L-band/S-band) switching.

8.2.4 RF measurements to verify equipment output levels.

8.2.5 Reception of distress type signals as per T.001 at S and L-Band.

8.2.6 Reception of C/S distress beacons/reference beacons into CRC system for decoding and entry into the Location Processing (LP) output file and/or display on the LUT monitor.

9 TECHNICAL DATA PACKAGE

9.1 The contractor must provide a written and/or electronic version of a technical data package that is associated with the antenna and RF systems installed to the Technical Authority (TA).

9.1.1 The Technical Data Package must include, as a minimum:

9.1.1.1 Interface Control Documents (ICD), if applicable.

9.1.1.2 Antenna and RF front end configuration drawings.

9.1.1.3 Parts lists.

9.1.1.4 Wiring diagrams.

9.1.1.5 Operation and/or user manuals for all hardware and software.

9.1.1.6 Maintenance manuals.

9.1.1.7 Acceptance test procedures.

9.1.1.8 Written Warranties for antenna system.

9.2 The Technical Data Packages must be made available in Microsoft Office format or in a PDF format approved by DND.

9.3 The technical data must be delivered in English to the TA. Canada will be responsible for any translation required.

9.4 The technical data must be delivered in Contractor standard format and the DND must be able to open and print any soft copies.

10 LOCATION OF WORK

10.1 All work must be completed at the selected CRC and/or DND sites within the NCR.

11 TRAVEL

11.1 Travel to the location site will be required for a pre-installation site visit and to install the antennas and achieve SAT acceptance. Travel costs must follow Treasury Board of Canada guidelines. Apart from travel of resources from the location of manufacturing/residence of the antennas to the installation site within the NCR, no other travel outside the NCR is covered.

Attachment 1

Mandatory and Point Rated Technical Criteria

PART 1 MANDATORY CRITERIA

MANDATORY CRITERIA (Pass or Fail ONLY)		
No. & SOW Reference	**Mandatory Criteria**	**PASS/FAIL**
M1	The Bidder must have at least 5 years experience in designing, manufacturing, and testing Radio Frequency (RF) antenna and associated hardware within the last 20 years.	
M2	The Bidder must have at least 5 years experience in providing SARSAT antenna and all associated equipment within the last 20 years.	
M3 6.1.1.3	The proposed antennas must have capability to receive both L-band (1544-1555 MHz) and S-band (2226-2227 MHz) signals from both experimental and operational Medium Earth Orbit Search and Rescue (MEOSAR) repeaters, track MEOSAR repeaters, and must have wide enough filtering to be able to receive signals anywhere within the L and S band ranges specified above.	
M4 6.1.1.4	The proposed antenna Gain over system noise Temperature (G/T) specification must be 10dB/K or higher at S-band, and 7.5dB/K or higher at L-band.	
M5 6.1.1.5	The proposed antenna reflector size must be 2.4 meters +/- 0.1 meters.	
M6 6.1.1.6	The Bidder must provide antennas where the whole antenna assembly is pressurized to reduce maintenance cost and increase reliability in harsh climate operation.	
M7 6.1.1.7	Operational ambient temperature range of the antenna system must be: -35 Degrees Celsius to +50 Degrees Celsius.	
M8 6.1.1.8	The proposed antennas and associated hardware must be able to operate, and allow the signal to be received and processed in accordance with applicable documents, in sustained winds of up to 50km/h and gusts up to 85km/h.	

Bidders who do not fully provide substantiation for any of the Mandatory Criteria as described below will be disqualified.

M1 Design, Manufacturing, and testing experience

The Bidder must have at least five (5) years experience in designing, manufacturing, and testing Radio Frequency (RF) antenna and associated hardware within the last twenty (20) years.

The Bidder must describe a minimum of five years that it has worked on as examples for meeting the required experience above.

In order to demonstrate its experience, the Bidder must provide project summary(ies) of each project that supports this MR, and should include, at a minimum:

1. The model name(s) of the antenna product(s).
2. The start and end dates of the referenced project (month and year) for delivering each antenna.
3. The client organization***.
4. A short description of the project's scope, tasks and deliverables.
5. A short description of the work conducted by the Bidder with respect to the project.
6. Client contact information.

*** Project(s) cited must have been for client(s) external to the Bidder's organization. The following project summaries will not be considered: for any organization that is related to the Bidder (e.g.: parent company or subsidiary of the Bidder and the Bidder's internal clients).

M2 Experience in Search and Rescue Satellite Aided Tracking (SARSAT)

The Bidder must have at least five (5) years experience in providing SARSAT antenna and any associated hardware within the last twenty (20) years.

The Bidder must describe a minimum of five years that it has worked on as examples for meeting the required experience above.

In order to demonstrate its experience, the Bidder must provide project summary(ies) of each project that supports this MR, and should include, at a minimum:

1. The model name(s) of the antenna product(s).
2. The start and end dates of the referenced project (month and year) for delivering each antenna.
3. The client organization***.
4. A short description of the project's scope, tasks and deliverables.
5. A short description of the work conducted by the Bidder with respect to the project.
6. Documentation that shows the project was in support of Sarsat requirements.
7. Client contact information.

*** Project(s) cited must have been for client(s) external to the Bidder's organization. The following project summaries will not be considered: for any organization that is related to the Bidder (e.g.: parent company or subsidiary of the Bidder and the Bidder's internal clients).

M3 S-BAND AND L-BAND ANTENNAS

The proposed antennas must have capability to receive both L-band (1544-1555 MHz) and S-band (2226-2227 MHz) signals from both experimental and operational Medium Earth Orbit Search and Rescue (MEOSAR) repeaters, track MEOSAR repeaters, and must have wide enough filtering to be able to receive signals anywhere within the L and S band ranges specified above.

The Bidder must provide the documentation (Detailed Specifications, Test Plans and Test Results) that shows how the proposed system meets this MR.

M4 ANTENNA GAIN OVER TEMPERATURE (G/T)

The proposed antennas Gain over system noise Temperature (G/T) specification must be 10dB/K or higher at S-band, and 7.5dB/K or higher at L-band.

The Bidder must provide the documentation (Detailed Specifications, Laboratory test results) that shows how the proposed system meets this MR.

M5 ANTENNA REFLECTOR

The proposed antenna reflector size must be 2.4 meters +/- 0.1 meters.

The Bidder must provide the documentation (Detailed Specifications, Laboratory test results) that shows how the proposed system meets this MR.

M6 PRESSURIZED ANTENNA FOR S-L BAND RECEPTION

Due to the harsh environment and the tracking of moving satellites for the above antennas, the whole antenna assembly must be pressurized to reduce corrosion and increase durability of mechanical motor and gear systems to handle temperatures as low as -35 Degrees Celsius. The gears must be packaged in cast housings and located inside a pressurized area to eliminate dust, moisture and other contaminants from gear grease; this will extend gear lubricant life and reduce maintenance issues beyond 5 years. Each antenna system assembly must have completely pressurized electrical cabinet, motor, and gear housings. Therefore, all antenna positioner components including motors, brakes, encoders, Automatic Control Unit (ACU) electronics and cable systems must be pressurized to be protected from moisture thus reducing maintenance issues such as rusted brakes, and failed control systems.

The Bidder must provide the documentation (Detailed Specifications and technical drawings) that shows how the proposed system meets this MR.

M7 OPERATIONAL AMBIENT TEMPERATURE RANGE

Operational ambient temperature range of the antenna system must be: -35 Degrees Celsius to +50 Degrees Celsius.

The Bidder must provide the documentation (Detailed Specifications, and Test Results) that shows how the proposed system meets this MR.

M8 OPERATIONAL WIND SPEED RANGE

The proposed antennas must be able to operate in sustained winds of up to 50km/h and gusts up to 85km/h.

The Bidder must provide the documentation (Detailed Specifications, and Test Results) that shows how the proposed system meets this MR. The proposed antennas and associated hardware must be able to operate, and allow the signal to be received and processed in accordance with applicable documents, in sustained winds of up to 50km/h and gusts up to 85km/h.

PART 2 POINT RATED CRITERIA

No. & SOW Reference Number	Point Rated Criteria on Bidder's proposed equipment	Evaluation Points (pts)
	Antenna positioner - The antenna positioner	
R1 6.2.1	1. Have internal humidity of antenna system monitored in electrical cabinet and in feed to maintain humidity levels between 20% - 90%. This will ensure condensing humidity is avoided; and will also keep humidity from dropping too low which can create conditions for static charge damages and/or degradation of components due to air dryness.	Cabinet & Feed = **6** pts Cabinet or Feed = **3** pts Neither = **0** pts
R2 6.2.2	2. Have an Automatic Control Unit (ACU) program that tracks LHCP and RHCP MEOSAR satellites (in both S and L-bands) satellites automatically given ephemeris data Two-Line Elements (TLEs); and can close the tracking position loop at least 20 Times per Second (TPS).	40 TPS = **10** pts 20-39 TPS = **6** pts <20 TPS = **0** pts
R3 6.2.5	3. Antenna positioner is either "Conformité Européenne" (CE) marked, Underwriter Laboratory (UL) Listed or independently laboratory tested to ensure that electrical safety and RF emissions testing meet recognized international standards. This is important for CRC/DND employee safety.	UL List. or CE = **4** pts Independent Lab. = **2** pts None = **0** pts
	Feed – The antenna feed	
R4 6.3.4	1. Have an axial ratio of 2 dB or lower.	<1.5dB = **6** pts 1.5dB – 2.0dB = **3** pts >2dB = **0** pts
R5 6.3.5	2. Use a purge valve that is automatically controlled by ACU to keep internal humidity of the Feed at optimum levels.	Yes = **6** pts No = **0** pts
	SARSAT - The Front End Sever (FES)	
R6 6.6.1	1. Monitor and control at least 4 antennas and associated downconverters simultaneously.	No. of antennas controlled by FES: 6 or more = **10** pts 4 and 5 = **6** pts <4 = **0** pts
R7 6.6.9	2. Provide built-in automated Software/Hardware diagnostic tools for testing antenna performance parameters, including, G/T tests and component simulation tools for software control integration testing.	Built-in Software/Hardware tools included for Testing: G/T = **6** pts Only component simulation tools = **2** pts Maximum of = **8** pts
	General	
R8 6.1.3	1. The Contractor should have technical experience in supplying and installing antennas, associated RF hardware, and tracking software for detecting, tracking and processing Cospas-SARSAT satellite repeater signals in S and L bands.	< 1 year = **2** pts 1+ to 3 years = **6** pts 3+ to 5 years = **10** pts
R9 6.1.2 7.1 7.1.8	2. Delivery, installation and successful testing of the four (4) antennas and associated hardware (including spares) at the Communication Research Centre (CRC) Canada and/or DND sites located in the National Capital Region (NCR).	By 31 March 13 = **25** pts After 31 March 13= **0** pts
MAXIMUM POINTS ALLOCATED		**85** pts
MINIMUM POINT OVERALL REQUIRED TO QUALIFY		**60** pts

Note: Evaluation points will not be awarded where the supporting information is incomplete or not provided.