



## RETURN BIDS TO:

## RETOURNER LES SOUMISSIONS À:

Bid Receiving Public Works and Government  
Services Canada/Réception des soumissions  
Travaux publics et Services gouvernementaux  
Canada

Pacific Region

401 - 1230 Government Street  
Victoria, B.C.

V8W 3X4

Bid Fax: (250) 363-3344

## REQUEST FOR PROPOSAL DEMANDE DE PROPOSITION

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

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

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

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

### Comments - Commentaires

### Vendor/Firm Name and Address

### Raison sociale et adresse du

### fournisseur/de l'entrepreneur

### Issuing Office - Bureau de distribution

Public Works and Government Services Canada - Pacific  
Region

401 - 1230 Government Street

Victoria, B. C.

V8W 3X4

<b>Title - Sujet</b> 4 Port Vector Network Analyzer	
<b>Solicitation No. - N° de l'invitation</b> 31034-201769/A	<b>Date</b> 2019-09-06
<b>Client Reference No. - N° de référence du client</b> 31034-201769	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$VIC-223-7805	
<b>File No. - N° de dossier</b> VIC-9-42098 (223)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2019-10-21</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Pacific Daylight Saving Time PDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Locke, Kelsey	<b>Buyer Id - Id de l'acheteur</b> vic223
<b>Telephone No. - N° de téléphone</b> (250) 507-2482 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> NATIONAL RESEARCH COUNCIL CANADA See herein	

Instructions: See Herein

Instructions: Voir aux présentes

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

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## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirements**

There is no security requirement associated with this solicitation.

### **1.2 Requirement**

The requirement is detailed under Article 6.2 of the resulting contract clauses.

### **1.3 Debriefings**

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

### **1.4 Trade Agreements**

The requirement is subject to the provisions of the North American Free Trade Agreement (NAFTA) and the Canadian Free Trade Agreement (CFTA).

### **1.5 epost Connect service**

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

## **PART 2 - BIDDER INSTRUCTIONS**

### **2.1 Standard Instructions, Clauses and Conditions**

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<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 \(2018-05-22\)](#) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

### **2.2 Submission of Bids**

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

Address:  
*Bid Receiving Public Works and Government Services Canada*  
*Pacific Region*  
*401-1230 Government Street*  
*Victoria, BC*  
*V8W 3X4*

Solicitation No. - N° de l'invitation  
31034-201769/A  
Client Ref. No. - N° de réf. du client  
31034-201769

Amd. No. - N° de la modif.  
File No. - N° du dossier  
VIC-9-42098

Buyer ID - Id de l'acheteur  
vic223  
CCC No./N° CCC - FMS No./N° VME

*epost Connect email:*

**TPSGC.RPReceptiondessoumissions-PRBidReceiving.PWGSC@tpsgc-pwgsc.gc.ca**

*Bids/Offers will be not be accepted if emailed directly to this email address. This email is to initiate an ePost Connect conversation, as detailed in the Standard Instructions.*

*Bid Facsimile number:*

*(250) 363-3344*

## **2.3 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

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

## **2.4 Applicable Laws**

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

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**

## **3.1 Bid Preparation Instructions**

If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. Bidders must provide their bid in a single transmission. The epost Connect service has the capacity to receive multiple documents, up to 1GB per individual attachment.

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

Section I: Technical Bid  
Section II: Financial Bid  
Section III: Certifications

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

Section I: Technical Bid (1 hard copy)

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**Section II: Financial Bid (1 hard copy)**

**Section III: Certifications (1 hard copy)**

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

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

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

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

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). To assist Canada in reaching its objectives, bidders should:

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

**Section I: Technical Bid**

In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

**Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment.

**3.1.1 Electronic Payment of Invoices – Bid**

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

If Annex “C” Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

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

**3.1.2 Exchange Rate Fluctuation**

[C3011T](#) (2013-11-06), Exchange Rate Fluctuation

**3.1.3 SACC Manual Clauses**

**Section III: Certifications**

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

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## PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

### 4.1 Evaluation Procedures

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

#### 4.1.1 Technical Evaluation

##### 4.1.1.1 Mandatory Technical Criteria

Refer to Annex "A": Requirement

#### 4.1.2 Financial Evaluation

SACC Manual Clause [A0220T](#) (2014-06-26), Evaluation of Price

### 4.2 Basis of Selection

[A0031T](#) (2010-08-16), Basis of Selection – Mandatory Technical Criteria

## PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

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

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

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

### 5.1 Certifications Required with the Bid

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

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

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

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

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

provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

### 5.2.1 Integrity Provisions – Required Documentation

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

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

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

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

## PART 6 - RESULTING CONTRACT CLAUSES

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

### 6.1 Security Requirements

There is no security requirement applicable to the Contract.

### 6.2 Requirement

The contractor must provide the items detailed under the "Requirement" at Annex "A"

### 6.3 Standard Clauses and Conditions

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

#### 6.3.1 General Conditions

[2010A](#) ([2018-06-21](#)), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

Section 09 entitled Warranty of general conditions 2010A is amended as follows:

Subsection 1 is deleted in its entirety and replaced with the following:

Despite inspection and acceptance of the Work by or on behalf of Canada and without restricting any provisions of the Contract or any condition, warranty or provision imposed by law, the Contractor, if requested by Canada to do so, must replace, repair or correct, at its own option and expense any work

that becomes defective or fails to conform to the requirements of the Contract, where applicable. The warranty period will be 36 months after delivery and acceptance of the Work or the length of the Contractor's or manufacturer's standard warranty period, whichever is longer.

Subsection 2 is deleted in its entirety and replaced with the following:

The Contractor must pay the transportation cost associated with returning the Work or any part of the Work to the Contractor's plant for replacement, repair or making good. The Contractor must also pay the transportation cost associated with forwarding the replacement or returning the Work or part of the Work when rectified to the delivery point specified in the Contract or to another location as directed by Canada. If, in the opinion of Canada, it is not expedient to remove the Work from its location, the Contractor must carry out any necessary repair or making good of the Work at that location. In such cases, the Contractor will be responsible for all Costs (including travel and living expenses) incurred in so doing, Canada will not reimburse these Costs.

All other provisions of the warranty section remain in effect.

## **6.4 Term of Contract**

### **6.4.1 Delivery Date**

**Mandatory: all the deliverables must be received on or before March 31, 2020.**

Bidder's best delivery date is \_\_\_\_\_ weeks upon receipt of order.

### **6.4.2 Delivery Points**

Delivery of the requirement will be made to delivery point(s) specified at Annex "B" of the Contract.

The Contractor must contact the Project Authority at least three (3) calendar days prior to the delivery date to coordinate delivery.

### **6.4.3 Shipping Instructions – Delivery at destination**

Delivered Duty Paid (DDP) 5071 West Saanich Road, Victoria BC V9E 2E7 Canada Incoterms 2000 for shipments from a commercial contractor.

### **6.4.4 Optional Goods**

The Contractor grants to Canada the irrevocable option to acquire the goods described at Annex "A" of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before March 31, 2020 by sending a written notice to the Contractor.

## **6.5 Authorities**

### **6.5.1 Contracting Authority**

The Contracting Authority for the Contract is:

Name: Kelsey Locke  
Title: Supply Officer  
Public Works and Government Services Canada



Solicitation No. - N° de l'invitation  
31034-201769/A  
Client Ref. No. - N° de réf. du client  
31034-201769

Amd. No. - N° de la modif.  
File No. - N° du dossier  
VIC-9-42098

Buyer ID - Id de l'acheteur  
vic223  
CCC No./N° CCC - FMS No./N° VME

Acquisitions Branch  
Address: 1230 Government St.  
Victoria B.C V8W 3X4

Telephone: 250-507-2482  
E-mail address: [Kelsey.locke@pwgsc-tpsgc.gc.ca](mailto:Kelsey.locke@pwgsc-tpsgc.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.

In the event that you are unable to contact the above noted Authority, please contact:

[PWGSC.PRVICCARP.TPSGC@pwgsc-tpsgc.gc.ca](mailto:PWGSC.PRVICCARP.TPSGC@pwgsc-tpsgc.gc.ca)

### 6.5.2 Technical Authority

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

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

Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

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

### 6.5.3 Contractor's Representative

The Contractor's Representative for the Contract is:

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

Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

## 6.6 Payment

### 6.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm unit price(s), as specified "in Annex B" for a cost of \$ \_\_\_\_\_. Customs duties are excluded and Applicable Taxes are extra.

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.

#### **6.6.2 Limitation of Price**

*SACC Manual* clause C6000C (2017-08-17) Limitation of Price

#### **6.6.3 Single Payment**

*SACC Manual* clause H1000C (2008-05-12), Single Payment

#### **6.6.4 Electronic Payment of Invoices – Contract**

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

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

#### **6.7 Invoicing Instructions**

The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed. Invoices must be distributed as follows:

- a. The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.
- b. One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

#### **6.8 Certifications and Additional Information**

##### **6.8.1 Compliance**

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

#### **6.9 Applicable Laws**

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in \_\_\_\_\_ (insert the name of the province or territory as specified by the Bidder in its bid, if applicable).

## 6.10 Priority of Documents

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

- (a) the Articles of Agreement;
- (b) the general conditions **2010A** (2018-06-21), General Conditions: Goods (Medium Complexity);
- (c) Annex A, Requirement;
- (d) Annex B, Basis of Payment;
- (e) the Contractor's bid dated \_\_\_\_\_ (*insert date of bid*)

## 6.11 SACC Manual Clauses

**B7500C** (2006-06-16), Excess Goods  
**C2000C** (2007-11-30), Taxes – Foreign based Contractor  
**A2000C** (2006-06-16), Foreign Nationals (Canadian Contractor)  
**A2001C** (2006-06-16), Foreign Nationals (Foreign Contractor)  
**B1501C** (2018-06-21), Electrical equipment

## 6.12 Insurance – No Specific Requirement

SACC Manual clause **G1005C** (2016-01-28), Insurance – No Specific Requirement

## 6.13 Inspection and Acceptance

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

## ANNEX "A"

### STATEMENT OF REQUIREMENT

#### Background

The Dominion Astrophysical Observatory, Herzberg Astronomy and Astrophysics Research Centre (HAA), National Research Council of Canada, located in Victoria, British Columbia, has a need for a vector network analyzer (VNA) operating up to at least 65 GHz. This VNA is to be used in the development of high-sensitivity radio astronomy instrumentation.

HAA requires a VNA with 4-ports in order to do its research on complex systems such as for differential measurements in balanced amplifier architectures and for its testing of multi-port devices such as Orthomode Transducers (a type of radio-frequency polarization splitter/mode controller). In order to provide better temperature stability and low loss, we require the 4-ports to be integrated into the base VNA unit with an internal dual-source capability (not an external add-on to a 2-port VNA). An operating frequency up to at least 65 GHz is required in order for Herzberg Astronomy and Astrophysics to pursue instrumentation development for Q-band (30 – 50 GHz) frequencies, V-band (50 – 75 GHz), and high-frequency systems for the Atacama Large Millimetre Array observatory and the next generation Very Large Array observatory.

**For each mandatory technical criterion, the Bidder must indicate whether the products proposed are compliant or not compliant by checking the appropriate box. Bidders MUST PROVIDE documentation to demonstrate compliance with the specifications and cross-reference with the page number of their supplied documentation. Simply stating that they meet the criterion is not sufficient. When referencing other documents submitted with the bid, the bidder should indicate the exact location of the referenced documents, including the document title, page number and paragraph/subparagraph number.**

**The Bidder must provide a response for each criterion in Table 1 and 2. The Bidder must provide sufficient detail to permit a complete evaluation.**

**Note: Canada will evaluate only the documentation provided with a bidder's bid. Canada will not evaluate information such as references to Web site addresses where additional information can be found, or technical manuals or brochures not submitted with the bid.**

**Table 1 – Firm Requirement**

Item	Mandatory Requirements	Comments	Yes/No	Bid Page Ref #
<b>Specifications for the base VNA</b>				
1.0	The instrument must be new (not a demonstration or refurbished unit) and must be a current Model: <ul style="list-style-type: none"><li>- The unit must be a stand-alone turn-key instrument, not a system comprised of several different devices – in particular it must have 4-</li></ul>			

Item	Mandatory Requirements	Comments	Yes/No	Bid Page Ref #
	<p>ports provided in the base unit and with a minimum of two sources</p> <ul style="list-style-type: none"> <li>- Must be able to perform vector measurements on a device under test (DUT) in any S-parameter configuration</li> <li>- Must have a dedicated built-in display/GUI capable of providing all display functionality and does not require a separate external monitor</li> <li>- All software and hardware functionality must be provided within a rack-mountable chassis and does not require a separate stand-alone computer</li> </ul>			
1.1	RF frequency range (minimum) 10 MHz – 65 GHz;			
1.2	IF bandwidth range (minimum) 10 Hz – 1 MHz;			
1.3	Number of points (minimum) 60001;			
1.4	Minimum settable power on each port without attenuators: -30 dBm (or less);			
1.5	Internal attenuators at receivers: 35 dB range (minimum) 10 dB steps (or finer);			
1.6	Internal attenuators at sources: 50 dB range (minimum) 10 dB steps (or finer);			
1.7	10 MHz phase reference, capable to lock to an external reference and generate own internal;			
1.8	Measurement resolution: 1 Hz (or finer);			
1.9	Maximum power level applied to port from DUT: +27 dBm (or higher);			
1.10	Maximum DC power level applied to port from DUT: 7 V (or higher);			
1.11	Test port connector type: 1.85 mm male, 50 Ohm;			
1.12	Bias-tees must be present on all 4 ports;			
1.13	Must be compatible with our existing W-band Keysight TRL type Cal Kit W11644A (New cal kit(s) are not included in this procurement);			
1.14	System dynamic range: difference between maximum leveled output power (specification) and receiver noise floor (specification) at the test port, 10 Hz IF bandwidth:			

Item	Mandatory Requirements	Comments	Yes/No	Bid Page Ref #
	1 GHz – 30 GHz: 115 dB (or higher) 30 GHz – 50 GHz: 105 dB (or higher) 50 GHz – 65 GHz: 102 dB (or higher)			
1.15	Maximum leveled output power:  1 GHz – 30 GHz: 10 dBm (or higher) 30 GHz – 50 GHz: 5 dBm (or higher) 50 GHz – 65 GHz: 2 dBm (or higher)			
1.16	VNA must measure and output differential S-parameters;			
1.17	VNA must be able to make frequency offset measurements;			
1.18	VNA must include the external power cord;			
1.19	VNA must include the appropriate torque wrench for the test port;			
1.20	Warranty: The Contractor must provide a warranty that covers return of the VNA to the factory for repair. The minimum duration of the warranty must be three years. If the VNA is sent for repair, the Contractor must supply a temporary replacement if the repair time exceeds eight weeks.			
1.21	VNA must have built-in hardware for an easy future upgrade (without return to factory) for time domain operation.			
1.22	The VNA must be fully calibrated at the factory, with the Contractor providing documentary evidence – the calibration should have been done recently.			
<b>Specifications while configured with OML 75 GHz – 116 GHz extension heads</b>				
2.0	The VNA will be used with existing 75 GHz – 116 GHz millimetre-wave VNA extension heads from OML, Inc (model V10VNA2-T/R-A); must be optimally operating with these extension heads, noting that the LO is run through a splitter requiring +13 dBm of power for this port:  <ul style="list-style-type: none"> <li>- The VNA when used with extension heads must provide equal or better performance between 75 GHz and 116 GHz than our current setup of a Keysight N5222A unit using our extension heads</li> <li>- The base VNA must be an integral 4-port (2 or 4 source) device for direct connection of the extension heads to result in a 2-port 75 GHz – 116 GHz measurement system</li> </ul>			

Item	Mandatory Requirements	Comments	Yes/No	Bid Page Ref #
	- The measurement data for the trace and movement stability specification must be supplied			
2.1	Frequency: 75 GHz – 116 GHz;			
2.2	Output power (with no attenuation on extender): 75 GHz – 110 GHz: 3 – 10 dBm 110 GHz – 116 GHz: 0 – 10 dBm			
2.3	Output power flatness (uncorrected): +/- 5 dB;			
2.4	VNA isolation (transmission measured with 100 Hz or 1 kHz IF bandwidth and both ports short-circuited, no attenuation used): 75 GHz – 110 GHz: -80 dB 110 GHz – 116 GHz: -70 dB			
2.5	Trace stability (measured with both extension heads directly connected after 2-port calibration and units have been powered on for at least 1 hour. Stability is maximum deviation from initial transmission response over a period of at least one hour. VNA should be set for 100 Hz or 1 kHz IF bandwidth, no attenuation, 2001 points, no averaging):  75 GHz – 110 GHz: +/- 0.02 dB 110 GHz – 116 GHz: +/- 0.03 dB			
2.6	Movement stability (Procedure: perform a standard 2-port (full) calibration after unit has been powered for at least 1 hour. Connect both extension heads together in a straight thru configuration. Starting from nominal position (A), move units by a minimum of 15 cm forwards and backwards (B, C); also lift up the extensions by 10 cm and move 15 cm forwards and backwards (D, E). Then, with respect to the nominal position, rotate heads by 90 degrees along the waveguide axis so that the heads lie along the vertical plane (F). See Figure 1 for measurement positions. Measure S21 and S12 for each position A, B, C, D, E, and F. Over the range of movement, the measured response should not vary by more than the specification. The VNA should be set for 100 Hz or 1 kHz IF bandwidth, no attenuation, 2001 points, no averaging:  75 GHz – 110 GHz: +/- 0.03 dB 110 GHz – 116 GHz: +/- 0.04 dB			

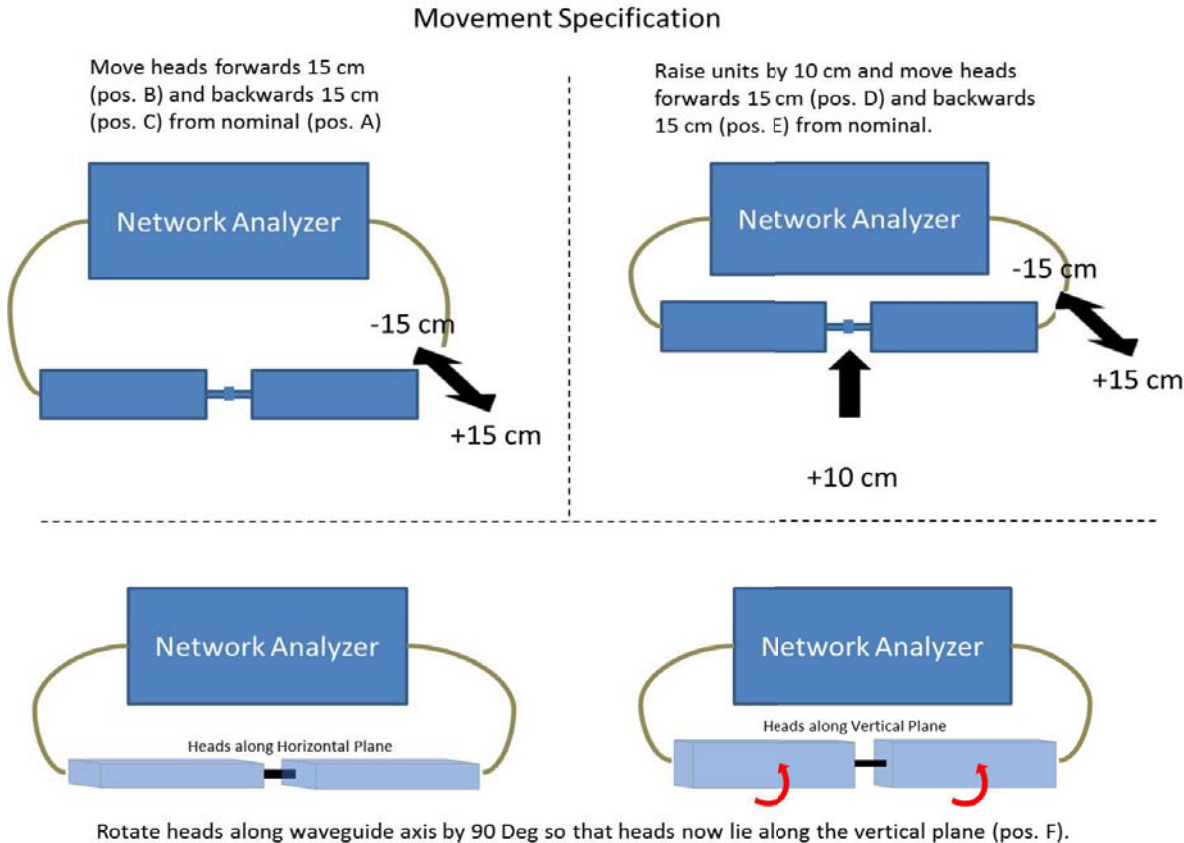
Item	Mandatory Requirements	Comments	Yes/No	Bid Page Ref #
	(Refer to figure 1.0 below)			
<b>Supplementary Information</b>				
3.0	Calibration: The VNA must be fully calibrated at the factory, with the Contractor providing documentary evidence – the calibration should have been done recently.			
3.1	The Contractor must provide a warranty that covers return of the VNA to the factory for repair. The minimum duration of the warranty must be three years. If the VNA is sent for repair, the Contractor must supply a temporary replacement if the repair time exceeds eight weeks.			

Table 2 – Canada's Option to Purchase

Item	Description	Comments	Yes/No	Bid Page Ref 3
1.0	For use with test cables: two (2) 1.85 mm female to 3.5 mm female adapters (note: test cables are not included in this procurement);			
1.1	For use with existing W-band extenders: four (4) 1.85 mm male to 3.5 mm female adapters, two (2) 1.85 mm female to 3.5 mm female adapters, and one (1) 1.85 mm female to 3.5 mm male adapter. These are in addition to the adapters required in item 1.0			



Figure 1.0



**Trade-In Option:** National Research Council Canada (NRC) is seeking additional value in any potential trade-in offer for an existing network analyzer(s) in order to bring maximum value and savings to Canada. If the Contractor elects to take delivery of NRC's existing network analyzer, then the Contractor will be responsible for all arrangements to pick up the equipment at NRC's facilities located 5071 West Saanich Rd, Victoria BC, Canada V9E 2E7

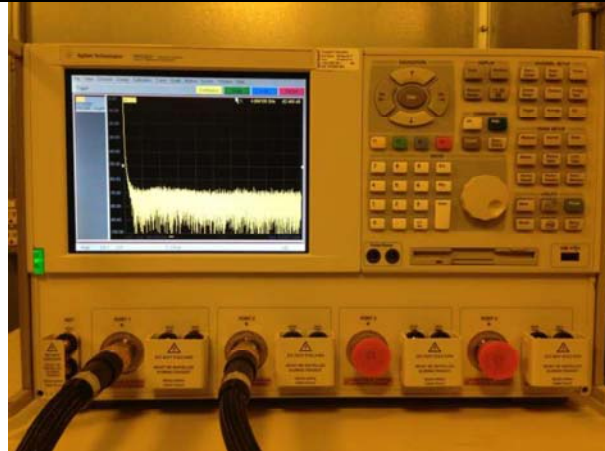
**Note:** Trade-In Option is restricted to choice of one (1) VNA unit below.

Unit 1	<p>N5230A PNA-L Network Analyzer with installed options 010, 245 300 kHz - 20 GHz, 4-port</p> <p>Manufacturer: Agilent Technologies (now Keysight) Quantity: One (1) Serial # MY45001864 Purchased: March 2003 Last factory calibration: 28-Sep-2017 Warranty start date: March 2003 (has expired)</p>
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31034-201769

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File No. - N° du dossier  
VIC-9-42098

Buyer ID - Id de l'acheteur  
vic223  
CCC No./N° CCC - FMS No./N° VME



Unit 2

N5222A PNA Network Analyzer with installed options 080, 401, 417  
10 MHz - 26.5 GHz, 4-port

Manufacturer: Keysight  
Quantity: One (1)  
Serial # MY55422140  
Purchased: March 2016  
Last factory calibration: 2-Mar-2016  
Warranty start date: March 2016 (has expired)



Bidder's best delivery date is \_\_\_\_\_ weeks ARO

## ANNEX "B"

### BASIS OF PAYMENT

Bidders must submit their financial bid using the financial evaluation table provided in this Annex.

Pricing offered must be in **Canadian dollars**, Applicable Taxes excluded, Delivered Duty Paid (DDP) to 5071 West Saanich Rd, Victoria BC V9E 2E7. Canadian customs duties and excise taxes included.

Firm unit price shall be inclusive of all direct and indirect expenses incurred in performing the requirement including but not limited to all labour, fringe benefits, overhead, supervision, tools, equipment, materials, parts, manuals, travel time, travel and living expenses, transportation costs, reports, general and administrative costs, profit required to do the work, all related duties and other costs paid by the Supplier such as additional surcharges, and transportation fees. No other charges will be accepted.

Failure to comply with any of the instructions provided in this Annex will render the bid non-responsive.

Financial Evaluation Table (Bidders must complete and submit this table with their bid)

Firm Requirement				
Item	Description	Unit	Quantity	Unit Price
1	One (1) Vector Network Analyzer  Model / Part # _____	EACH	1	\$ _____
2	Trade-in offer for one (1) existing Vector Network Analyzer (if offered by supplier)  VNA trade-in for _____ (Unit 1 or Unit 2)	EACH	1	Minus \$ _____
Total Price Firm Requirement				\$ _____
Canada's Option to Purchase				
1.	Two (2) 1.85 mm female to 3.5 mm female adapters as per Annex "A" Table 2 – 1.0	LOT	1	\$ _____
2.	Four (4) 1.85 mm male to 3.5 mm female adapters, two (2) 1.85 mm female to 3.5 mm female adapters, and one (1) 1.85 mm female to 3.5 mm male adapter as per Annex "A" Table 2 – 1.1	LOT	1	\$ _____
Total Price Optional Requirement				\$ _____
<b>TOTAL EVALUATED PRICE = TOTAL PRICE FIRM REQUIREMENT + TOTAL PRICE OPTIONAL REQUIREMENT</b>				

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Buyer ID - Id de l'acheteur  
vic223  
CCC No./N° CCC - FMS No./N° VME

**Delivery Address:**

5071 West Saanich Rd.  
Victoria BC  
V9E 2E7

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## **ANNEX “C”**

### **ELECTRONIC PAYMENT INSTRUMENTS**

The Bidder accepts any of the following Electronic Payment Instrument(s):

- ☐ ( ) VISA Acquisition Card;
- ☐ ( ) MasterCard Acquisition Card;
- ☐ ( ) Direct Deposit (Domestic and International);
- ☐ ( ) Electronic Data Interchange (EDI);
- ☐ ( ) Wire Transfer (International Only);
- ☐ ( ) Large Value Transfer System (LVTS) (Over \$25M)