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7 ième étage
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Québec
H5A 1L6
FAX pour soumissions: (514) 496-3822

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

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Title - Sujet DÉVELOPPEMENT DES TECHN. SPATIALES	
Solicitation No. - N° de l'invitation 9F063-140572/B	**Amendment No. - N° modif.** 002
Client Reference No. - N° de référence du client 9F063-140572	**Date** 2016-02-23
GETS Reference No. - N° de référence de SEAG PW-$MTB-575-13737	
File No. - N° de dossier MTB-4-37358 (575)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2016-03-17**	**Time Zone** **Fuseau horaire** Heure Normale du l'Est HNE
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Jurca, Anca	**Buyer Id - Id de l'acheteur** mtb575
Telephone No. - N° de téléphone (514) 496-3378 ( )	**FAX No. - N° de FAX** (514) 496-3822
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

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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**

Canada

PROJECT TITLE: **Space Technologies Development**

The above mentioned Request for Proposal (RFP) is hereby amended to:

1. answer questions received;
2. add a requirement and make clarifications.

1. For Priority Technology 18 (PT-18) - Gallium Nitride (GaN) High Power Amplifier development for C and X-Band Applications

Question 1: At page A-28, Note 2, is stated that "For the purpose of this RFP, a breadboard is defined as a packaged, standalone totally enclosed amplifier ...". Does it mean that the whole amplifier breadboard (MMIC + circuit + heatsink + fixture) has to be totally boxed /covered from all directions or it is acceptable to have the amplifier in a breadboard format without top cover?

Answer 1: The whole breadboard has to be totally enclosed within a package (with cover), as stated in Note 2 of the RFP on page A-28. The enclosed HPA breadboards may be delivered mounted on a heatsink (outside the enclosure) at the discretion of the supplier, per proposal. The HPA breadboards are intended for future laboratory use and may ultimately be integrated into a higher level assembly. Therefore, the breadboards must be packaged in a manner to prevent internal damage that could result from routine handling.

Add a requirement: Add at the end of Note 3 (p. A-29) and at the end of Note 4 (p. A-30):

The HPA requirements must be met for a mounting surface (i.e. HPA baseplate) temperature of +50°C or less and with the goal of meeting them with a mounting surface temperature of +70°C or less.

Clarification: Canadian Content

This procurement is limited to Canadian services. The Bidder must certify that a minimum of 80 percent of the total bid price consist of Canadian services as defined in clause A3050T.

2. For Priority Technology 19 (PT-19) - Multi-Channel SAR Receiver

Question 1: In the SOW, at page A-38 it is stated “The contractor must provide a development plan to qualify the design for space operation…” We interpret this to mean that we need to provide a ‘plan towards qualification’ but we should not be executing this plan within the scope of this activity. To this end, our usual approach to develop the breadboard is to find COTS components that either could be qualified for space, or have equivalents/analogs that are already space qualified. Can you confirm if our understanding is correct?

Answer 1: Yes, your understanding is correct. Indeed, a development plan must be provided but its execution is not required within the scope of the activity. According to the SOW, the plan must include the following information:

- The tasks required to qualify the design;
- A schedule;
- Identification of the main technical risks; and
- An estimate of the cost to complete the tasks.

Question 2: It is our understanding that the benchtop deliver need not be made from 100% radiation hardened components. Can you confirm?

Answer 2: There is no requirement for 100% radiation hardened components for the prototype. However, the contractor must be able to demonstrate in the *development plan to qualify the design for space operation* that equivalent radiation-hardened parts exist or that mitigation strategies can be employed to minimize the impact of radiation when non radiation-hardened parts are used.

Clarification: Clarification of the following statement of the SOW (p. A-37): "The breadboard does not have to implement redundancy or all the receive chains but the contractor must explain how an eventual implementation in the targeted space mission will be configured with the multiple receive chains and with redundant hardware."

It is expected that the final design will need to operate over an extended period of time. Redundancy is usually required in such case. This means that the final configuration of the system should be able to use a cold redundant hardware (cross-strapping) in case a failure occurs. In others word, the proposed architecture should enable a design where a single failure in any part of the design will not cause any degradation in performance or functionality of the unit once a remote command is sent to reconfigure the hardware. The scope of the contract does not require the contractor to build the redundant hardware but the contractor must show that these constraints will be considered during the trade-off analysis. Also, it should be shown in the *development plan to qualify the design for space operation* how the prototype can be expanded to cover the additional receive chain and the ability to use redundant hardware.

The requirements for this project require channel assignment flexibility. The design must have the ability to use a combination of various channels assigned to different parts of the antenna and polarization. To minimize the data rate for some mode, it is desired to be able to combine on-board some of the channels. As an example, with 4 apertures, the following configuration could be possible:

- The antenna is divided into 4 sections; each section is assigned to a receive channel, either V or H polarization can be selected.
- The antenna is divided into 2 sections; each section is assigned to one channel per polarization.
- The whole antenna is assigned to a single channel per polarization.

In this scenario, the antenna provides 8 RF interface, two polarizations for each of the 4

antenna sections. In this case, the proposed solution will need to be able to select and combine the signal into the desired combination.

ALL OTHER TERMS AND CONDITIONS OF THE RFP REMAIN UNCHANGED.