



**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 0B2 / Noyau 0B2  
Gatineau, Québec K1A 0S5  
Bid Fax: (819) 997-9776**

**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**

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

**Issuing Office - Bureau de distribution**  
Scientific, Medical and Photographic Division /  
Division de l'équipement scientifique, des produits  
photographiques et pharmaceutiques  
11 Laurier St./ 11 rue, Laurier  
6A2, Place du Portage  
Gatineau, Québec K1A 0S5

<b>Title - Sujet</b> Fuel Conditioning Unit	
<b>Solicitation No. - N° de l'invitation</b> 31184-184827/A	<b>Amendment No. - N° modif.</b> 002
<b>Client Reference No. - N° de référence du client</b> 31184-184827	<b>Date</b> 2018-03-26
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$PV-904-74422	
<b>File No. - N° de dossier</b> pv904.31184-184827	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-04-05</b>	<b>Time Zone Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Frigon, Francine	<b>Buyer Id - Id de l'acheteur</b> pv904
<b>Telephone No. - N° de téléphone</b> (819) 743-4279 ( )	<b>FAX No. - N° de FAX</b> (819) 956-3814
<b>Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:</b> NATIONAL RESEARCH COUNCIL CANADA BLDG M-10 1200 MONTREAL RD, OTTAWA, ONTARIO K1A0R6	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur</b>	
<b>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)</b>	
<b>Signature</b>	<b>Date</b>

**Amendment # 002 is raised to extend the bid closing date, to add a mandatory technical evaluation criteria in Annex A – Part 2.1 and answer additional questions received from industry as follows:**

**1. Page 1 of Solicitation document: Solicitation Closes:**

**Delete:** at: 02:00 PM Eastern Standard Time On: 2018-03-28

**Insert:** at: 02:00 PM Eastern Daylight Savings Time On: 2018-04-05

**2. At Annex “A” – Part 2.1 – Mandatory Technical Evaluation Criteria - Add Item 8:**

**Delete:** Table in its entirety.

**Replace:**

ITEM	CRITERIA	MUST BE PROVIDED WITH BID FOR EVALUATION	REFERENCE TO SUBSTANTIATION IN THE TECHNICAL BID														
1	<p><b>Temperature Control Capability must:</b></p> <p>a) Range: -90 to 250°C</p> <p>b) Stability: ±0.05 to 0.2°C</p>	Provide written documentation that references the design and clearly indicates this option in the manual															
2	<p><b>Cooling/Heating Capacity must:</b></p> <p>a) Cooling: ≥ 6.5 kW @ -60 °C</p> <table border="1"> <tr> <td>Temperature [°C]</td> <td>200</td> <td>20</td> <td>0</td> <td>-40</td> <td>-60</td> <td>-80</td> </tr> <tr> <td>Cooling capacity [kW]</td> <td>≥30</td> <td>≥19</td> <td>≥15</td> <td>≥ 9</td> <td>≥6.5</td> <td>≥1.5</td> </tr> </table> <p>b) Heating: ≥ 36 kW</p> <p>c) Cascade temperature control</p>	Temperature [°C]	200	20	0	-40	-60	-80	Cooling capacity [kW]	≥30	≥19	≥15	≥ 9	≥6.5	≥1.5	Provide written documentation that references the design and clearly indicates this option in the manual	
Temperature [°C]	200	20	0	-40	-60	-80											
Cooling capacity [kW]	≥30	≥19	≥15	≥ 9	≥6.5	≥1.5											
3	<p><b>Pump Capacity must:</b></p> <p>a. Flow rate: 26 to 80 l/min</p> <p>b. Pressure: 5.5 bar</p> <p>c. Viscosity: 70 cst</p> <p>d. Internally integrated pressure control</p> <p>e. Filling level indicator and pump capacity</p>	Provide written documentation that references the design and clearly indicates this option in the manual															

	displayed electronically		
<b>4</b>	<p><b>Data Communication must:</b></p> <p>a) Integrated connections for:</p> <ul style="list-style-type: none"> <li>• USB;</li> <li>• RS232 Ethernet;</li> <li>• SD Card; and</li> <li>• alarm output.</li> </ul> <p>b) I/O communication options of:</p> <ul style="list-style-type: none"> <li>• RS485;</li> <li>• Profibus DP;</li> <li>• Modbus; and</li> <li>• optional analog connections</li> </ul> <p>c) Integrated TCP/IP/Modbus Protocols</p>	Provide written documentation that references the design and clearly indicates this option in the manual	
<b>5</b>	<p><b>Peripheral Device Accommodation must</b></p> <p>a) Integrated connections for two Pt100 sensors</p> <ul style="list-style-type: none"> <li>• Ability to alternate control by monitoring parameters for each sensor; and</li> <li>• Ability to incorporate external temperature measurement into TCU control loop.</li> </ul>	Provide written documentation that references the design and clearly indicates this option in the manual	
<b>6</b>	<p><b>Software &amp; Analytics</b></p> <p>a) Completely integrated control software platform with TFT touchscreen interface</p> <p>b) Multilingual user interface (English and French as a minimum)</p> <p>c) Ability for user to set all safety limits/parameters (pressure limits, flow limits, temperature limits).</p> <p>d) Three tier user access levels for security</p> <p>e) Extensive warning, protection, and monitoring functions with detailed self-explanatory messages</p> <p>f) Continuous diagnostics capabilities (of TCU systems)</p> <ul style="list-style-type: none"> <li>• monitoring of the TCU during operation</li> </ul>	Provide written documentation that references the design and clearly indicates this option in the manual	

<p><b>7</b></p>	<p><b>Physical &amp; Environmental</b></p> <ul style="list-style-type: none"> <li>a) Device must be mounted on casters</li> <li>b) Device must have transport anchorage (for transport with a forklift)</li> <li>c) Max dimensions (W x L x H): 100 x 130 x 200 cm</li> <li>d) Max weight: 1000 kg</li> <li>e) Ambient temperature range +5°C to +40°C</li> </ul>	<p>Provide written documentation that references the design and clearly indicates this option in the manual</p>	
<p><b>8</b></p>	<p>The Temperature Control Unit (TCU) must be an off the shelf unit that is commercially available.</p>	<p>Provide proof</p>	

**3. Questions/Answers:**

**Q5.** Please provide the available utilities for this project.

- A5.**
- Electrical
  - City water
  - Compressed air

**Q6.** What thermal fluid is to be used or are we to select one? Given the temperature parameters, we have found only one fluid that comes close to meeting the temperature range of the specification. This fluid presents challenges in the temperature/operating range at the higher temperature side with high pressure.

**A6.** We will rely on the vendor's recommendation to select a working fluid that meets the stated heating/cooling requirements of the temperature control unit (TCU). If a single working fluid cannot meet the total range of temperatures required, we are open to using different working fluids for different temperature ranges, assuming all working fluids can be used interchangeably within the same TCU. Note: the working fluid will be purchased separately from the TCU, such that the amount (and cost) of working fluid **does not** have to be included in the current bid.

**Q7.** Are the maximum heating and cooling temperature ranges firm? Mechanical cascade refrigeration is limited to a low of -100F (-73.3°C) fluid using R-508B. If the requirement is lower than -100F (-73.3°C) fluid, the only option is to use liquid nitrogen to achieve the lowest temperature at -130F.

**A7.** We have provided the temperature and heating/cooling capacity requirements for our application.

**Q8.** Please let us know the details about the anticipated process cycle for ramp up and down temperatures and time duration for each cycle. It is listed, over 36kW for heating and 6.5kW @ -76F (-60°C), however, it may take quite some time to achieve those temperatures for either heating or cooling. The operating kW for each side is understood, but may need to be increased to account for cycle times.

**A8.** The ramp up and down temperatures and the time of each temperature cycle will vary significantly among test campaigns. We have accounted for potential cycle times in our stated heating/cooling requirements.

**Q9.** This system will likely require three separate heat exchange circuits to supply the full range of temperatures requested. We can achieve the low end temperature using Ln2, and can achieve the mid-range temperatures either by an external chilled fluid utility or mechanical refrigeration. We can achieve the high end temperatures either by electric immersion heater or available steam utility.

**A9.** We have a requirement for a turn-key solution to our technical requirements. It is up to the vendor to oversee design specifications of the TCU and provide the most effective and reliable solution, while ensuring the safest operation of all required equipment.

**Q10.** Could you please advise the Type or the Thermal Properties of the Liquid Fuel for the Gas Turbine Lab? To select the proper pump and heat exchanger, we would need to know the Liquid Fuel type, or the Thermal Properties of the Liquid Fuel as below:

- Thermal Conductivity, Specific Heat, Viscosity and Density in the range of -90 to 250°C.

**A10.** The current requirement is strictly for the temperature control unit (TCU) and does not include the heat exchanger or the pump to drive the liquid fuel. Nevertheless, for information, we will use the TCU on fuels such as Jet-A, Jet-B, aviation gasoline, and diesel.

**Q11.** Regarding the subject solicitation, could you please advise us on the following regarding this kit:

**Q11 a)** Would you like us to include tubing for your set up?

**A11 a)** Yes, we will require tubing to bring the working fluid from the temperature control unit (TCU) to the heat exchanger.

**Q11 b)** Would you like us to include silicone fluid for your set up?

- If so, for which temperature range:
  - -90...+170
  - -60...+250
- Do you know how much fluid will be in your flow loop (not including the temperature control unit)?

**A11 b)** We will rely on the vendor's recommendation to select a working fluid that meets the stated heating/cooling requirements of the temperature control unit (TCU). If a single working fluid cannot meet the total range of temperatures required, we are open to using different working fluids for different temperature ranges, assuming all working fluids can be used interchangeably within the same TCU.

o Note: the working fluid will be purchased separately from the TCU, such that the amount (and cost) of working fluid **does not** have to be included in the current bid.

**Q12.** Do you need any special adapters/fittings for attaching to your application?

**A12.** No, we do not need any special adapters/fittings. Adapters and fittings can be selected once the TCU has been purchased.

**Q13.** Would you require an external inline pressure sensor?

**A13.** No, we do not require an external pressure sensor.

**Q14.** Regarding MTC item 2, if except for 200°C, all the cooling/heating capacity specifications be met, would you accept 29kw cooling capacity at 200°C?

**A14.** If all other cooling/heating capacities are met, yes, a 29kw cooling capacity at 200°C would be acceptable.

**Q15.** Regarding MTC item 3, reference:" Pump Capacity must:

- a. Flow rate: 26 to 80l/min
- c. Viscosity: 70cst"

We could supply a system with 26 to 80l/min flow rate & 50cst viscosity and another system with 18 to 70l/min flow rate & 70cst viscosity. Would you please relax these criteria to 26 to 80l/min flow rate & 50cst viscosity? Or to add the possibility of offering an alternative 18 to 70l/min flow rate & 70cst viscosity.

**A15.** We will add the possibility of offering an alternative 18 to 70l/min flow rate & 70cst viscosity.

**Q16.** Regarding MTC item 4, would you require the possibility of option for analog connections, RS485, Profibus DP, Modbus, or do you require to these communications to be supplied with the system?

**A16.** I/O communications for RS485, Profibus DP, Modbus, and analog connections are options, and do not need to be supplied with the system.

**Q17.** Regarding MTC item 5, would you also require the Pt100 external temperature probe (sensors) themselves as well? Or do you just need the connection?

**A17.** No, two Pt100 temperature probes are not required for the bid. We require integrated connections for two Pt100 sensors.

**ALL OTHER TERMS AND CONDITIONS OF THE SOLICITATION DOCUMENT REMAINS THE SAME.**