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**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**  
Public Works and Government Services Canada  
Ontario Region  
33 City Centre Drive  
Suite 480  
Mississauga  
Ontario  
L5B 2N5

<b>Title - Sujet</b> Conséquences de l'automatisation su	
<b>Solicitation No. - N° de l'invitation</b> W7719-165325/A	<b>Amendment No. - N° modif.</b> 002
<b>Client Reference No. - N° de référence du client</b> W7719-165325	<b>Date</b> 2016-11-02
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$TOR-302-7179	
<b>File No. - N° de dossier</b> TOR-5-38183 (302)	<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 2016-11-22</b>	
<b>Time Zone</b> Fuseau horaire Eastern Standard Time EST	
<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> Berends, Robert	<b>Buyer Id - Id de l'acheteur</b> tor302
<b>Telephone No. - N° de téléphone</b> (905) 615-2465 ( )	<b>FAX No. - N° de FAX</b> (905) 615-2060
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**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</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>

Amendement est porté à répondre à des questions à ce jour, de prolonger la date de clôture, la révision Partie 4.1.1.4 Point de critères techniques nominales et de réviser l'annexe B, Base de paiement.

#### Questions et réponses

Q1. – Est-ce que l'on s'attend à ce que toutes les expériences prévues à l'Énoncé des travaux soient réalisées?

R1. – Non. Le nombre d'expériences est négociable en fonction de leur complexité et de leur durée. La principale expérience est prévue au point 3b. Les expériences prévues au point 4b sur la durée des quarts de travail seront peut-être réalisées. Si elles sont réalisées, elles devront être réduites et porteront peut-être sur des questions liées à la vigilance plutôt que de faire travailler les participants durant plusieurs quarts de travail de longue durée.

Q2. – Est-ce que les critères de rendement requis seront fournis?

R2. – Nous avons déjà défini les principaux critères que nous souhaitons évaluer globalement, mais nous ne connaissons pas encore les détails. Durant la conception des expériences, nous nous attendons à ce que l'entrepreneur collabore avec nous à élaborer des critères plus précis et à les peaufiner.

Q3. – Est-ce que des prototypes de concepts d'automatisation du travail seront fournis afin qu'ils soient prêts à être intégrés aux bancs d'essai de l'entrepreneur?

R3. – Nous avons recensé certaines plateformes expérimentales pour procéder aux expériences et ces plateformes ont prédéfini les capacités d'automatisation. Elles devront sans doute être ajustées afin que nous puissions imiter l'automatisation des frégates de classe Halifax, mais les fonctions principales seront déjà présentes. Nous ne nous attendons pas à ce que l'entrepreneur déploie un niveau d'effort élevé, mais il devra fournir son avis et des suggestions sur les changements à apporter.

Q4. – Comme la prise de décisions opérationnelles est une compétence très complexe que l'on peut acquérir grâce à une formation en profondeur et une grande expérience, quelles sont les attentes liées à la disponibilité de candidats adéquats?

R4. – Pour l'instant, on prévoit utiliser des membres du personnel de la Marine dont la principale fonction sera d'agir à titre de participants afin que peu de formation de base liée aux tâches primaires soit nécessaire. Cependant, une formation sérieuse devra être donnée afin que les participants connaissent bien l'interface utilisateur graphique du banc d'essai et les nuances de la tâche expérimentale. De la formation devra également être donnée pour limiter le transfert négatif qui pourrait être lié à l'utilisation de participants spécialistes.

Q5. – Combien de points seront attribués pour les puces 4 et 5?

R5 – Veuillez vous reporter à la version révisée de la partie 4.1.1.4.

Q6. – Est-ce que les frais de transport/déplacement sont ou seront inclus en plus du financement maximum de 120 000 \$.

R6. – Les frais de transport vers les emplacements proposés sont inclus dans les 120 000 \$.

Q7. – Est-ce que le Canada est ouvert à verser des paiements d'étape ou des paiements progressifs plus fréquemment?

R7. – Oui. Veuillez vous reporter à la version révisée de l'annexe B, Base de paiement.

Q8. – Est-ce que les participants aux expériences doivent posséder des connaissances, des compétences ou des capacités particulières afin d'être choisis (p. ex. opérateur de la MRC ayant une expérience antérieure en salle des opérations dans une frégate de classe Halifax pour ce qui est de l'exécution de fonctions de combat)? Si on a recours au personnel de la MRC, est-ce que RDDC nous aidera à joindre ces personnes?

R8. RDDC sera chargé de joindre les membres du personnel de la MRC afin qu'ils participent aux expériences.

Q9. – Est-ce que RDDC fournira la nouvelle automatisation de la MCH en vue de son intégration subséquente aux bancs d'essai expérimentaux?

R9. – Nous fournirons les bancs d'essai pour effectuer les expériences au moyen des participants et nous espérons que nous puissions modifier l'automatisation originale de ces bancs d'essai en vue de simuler l'automatisation de la MCH.

#### 4.1.1.4 Critères techniques cotés

Supprimer : dans son intégralité.

Insérer : Révision 1 – 4.1.1.4 Critères techniques cotés

POINT-RATED EVALUATION CRITERIA		Minimum	Maximum
<b>P1</b>	<p>Scientific knowledge: The Principal Investigator should have experience conducting research on human factors and automation, as evidenced by peer-reviewed publications. The bidder must identify specific publications in response to this criterion.</p> <ul style="list-style-type: none"><li>• 2 points for each journal paper or book chapter on human factors and automation (Note: more than one book chapter from the same book can receive a maximum of 10 points in total).</li><li>• 1 point for each conference paper on human factors and automation</li><li>• 1 point for each journal paper on automation only where the research involves no human factors intervention (e.g., technology, interface, training, work design, etc.)</li></ul>	<b>6</b>	<b>20</b>
<b>P2</b>	<p>Scientific knowledge: The Principal Investigator should have experience conducting human factors research on teams, as evidenced by peer-</p>	<b>2</b>	<b>15</b>

	<p>reviewed publications. The bidder must identify specific publications in response to this criterion.</p> <ul style="list-style-type: none"> <li>• 2 points for each journal paper or book chapter on human factors and teams (Note: more than one book chapter from the same book can receive a maximum of 10 points in total).</li> <li>• 1 point for each conference paper on human factors and teams</li> <li>• 1 point for each journal paper on teams only where the research involves no human factors intervention (e.g., technology, interface, training, work design, etc.)</li> </ul>		
<b>P3</b>	<p>Scientific knowledge: The Principal Investigator should have experience conducting human factors research on worker characteristics (e.g., knowledge, skills, abilities, etc.) or work processes (e.g., task schedule, task roles and responsibilities, etc.), as evidenced by peer-reviewed publications. The bidder must identify specific publications in response to this criterion.</p> <ul style="list-style-type: none"> <li>• 2 points for each journal paper or book chapter on human factors and worker characteristics (Note: more than one book chapter from the same book can receive a maximum of 10 points in total).</li> <li>• 2 points for each journal paper on human factors and work processes</li> <li>• 1 point for each conference paper on human factors and worker characteristics</li> <li>• 1 point for each conference paper on human factors and work processes</li> <li>• 1 point for each journal paper on worker characteristics or work processes only where the research involves no human factors intervention (e.g., technology, interface, training, work design, etc.)</li> </ul>	<b>2</b>	<b>15</b>
<b>P4</b>	<p>Domain knowledge: The Principal Investigator should have experience conducting research in support of the military or a government defence department. The bidder must provide a summary for each project in response to this criterion, up to a maximum of four summaries. Each summary must be maximum of one page and must describe the objective, scope, deliverables, and the role(s) of the Principal Investigator or proposed resources.</p> <p>Up to four points for each project, up to four projects:</p>	<b>0</b>	<b>10</b>

	<ul style="list-style-type: none"> <li>• 1 point if project includes literature review</li> <li>• 1 point if project includes development of experimental platform</li> <li>• 1 point if project includes a human experiment</li> <li>• 1 point if project includes a second human experiment</li> </ul> <p>(e.g., a project that includes a literature review and two experiments will score three points; a second project that includes an experimental platform and one experiment will score two points; these two projects together will score five points out of ten).</p>		
<b>P5</b>	<p>Domain knowledge: The Principal Investigator should have experience conducting research in the Maritime domain. The bidder must provide a summary of each project in response to this criterion in the same format identified in P4, up to a maximum four summaries. The bidder may use some or all of the same summaries to address P4 and P5, or the bidder may use new summaries for P5.</p> <p>Up to three points for each project, up to four projects:</p> <ul style="list-style-type: none"> <li>• 3 points if project is in support of the Royal Canadian Navy</li> <li>• 2 points if project is in support of an allied Navy (e.g., Five Eyes, NATO)</li> <li>• 1 point if project is in support of civilian maritime applications</li> </ul>	<b>0</b>	<b>10</b>

<p><b>P6</b></p>	<p>Qualifications of Personnel: The bidder should have sufficient qualified personnel resources to perform the work in the Statement of Work, including backup capability in case one or more proposed resource becomes unavailable during the execution of the contract. The resumes provided in M3 will be used to assess this criterion. The top 4 candidates will be considered.</p> <p>This criterion will not evaluate the Principal Investigator. Up to five points for each qualified resource:</p> <ul style="list-style-type: none"> <li>• 5 points for a PhD in Engineering, Psychology, or Computer Science, and either one human factors course or one peer-reviewed human factors publication</li> <li>• 5 points for a Master's degree in Engineering, Psychology, or Computer Science, and one human factors course and one peer-reviewed human factors publication</li> <li>• 4 points for a Master's degree in Engineering, Psychology, or Computer Science, and one human factors course or one peer-reviewed human factors publication</li> <li>• 3 points for a Bachelor's degree in Engineering, Psychology, or Computer Science, and two human factors courses</li> <li>• 2 points for a Bachelor's degree in Engineering, Psychology, or Computer Science, and one human factors course</li> <li>• 1 point for a Bachelor's degree in Engineering, Psychology, or Computer Science, and no human factors course</li> </ul> <p>Acceptable human factors course titles may include: Human-centred, User-centered, or Work-centered design, analysis, or evaluation; Theoretical methods, analytical methods, or empirical methods, or case studies in human factors or ergonomics; Engineering psychology; Human-computer interaction or usability.</p>	<p><b>5</b></p>	<p><b>20</b></p>
<p><b>P7</b></p>	<p>Facility and Equipment: The bidder should have facility and equipment to support human factors experiments involving multiple operators and the use of automation. The facility description in M2 will be used to evaluate this criterion.</p> <p>Under this criterion the following terms are defined:</p>	<p><b>4</b></p>	<p><b>10</b></p>

	<p><b>Separate areas</b> – are defined such that person(s) in each area are unable to see each other from a standing position, and are unable to communicate verbally without a phone or other technological support.</p> <p><b>Distributed Teams</b> – are defined such that at least two members are located in separate areas.</p> <ul style="list-style-type: none"> <li>• 10 points if the facility includes four or more networked computers and a server for human experiments, and two or more separate areas for these networked computers to support distributed teams, and hardware and software for data collection and analysis.</li> <li>• 9 points if the facility includes three or more networked computers and a server for human experiments, and two or more separate areas for these networked computers to support distributed teams, and hardware and software for data collection and analysis.</li> <li>• 8 points if the facility includes three or more networked computers and a server for human experiments, and hardware and software for data collection and analysis</li> <li>• 7 points if the facility has four or more standalone computers for human experiments, and hardware and software for data collection and analysis</li> <li>• 6 points if the facility includes two or more networked computers for human experiments, and hardware and software for data collection and analysis</li> <li>• 5 points if the facility has three or more standalone computers for human experiments, and hardware and software for data collection and analysis</li> <li>• 4 points if the facility has two or more standalone computers for human experiments, and hardware and software for data collection and analysis</li> <li>• 2 points if the facility has two or more standalone computers for human experiments, and no hardware or software for data collection and analysis</li> <li>• 0 points if the facility has less than two computers, and no hardware or software for data collection and analysis</li> </ul>		
<b>P8</b>	<p>Facility and Equipment: The bidder must have access to library services to conduct literature review. The bidder should provide a description of the library resources. This description should be maximum of one page.</p>	<b>1</b>	<b>5</b>

	<ul style="list-style-type: none"> <li>• 5 points if bidder has access to a subscription-based bibliographic databases on human sciences and engineering, and access to professional librarians for support</li> <li>• 3 points if bidder has access to subscription-based bibliographic databases on human sciences and engineering</li> <li>• 1 point if bidder has access subscription-based databases on human sciences only or on engineering only</li> <li>• 0 point if bidder has no access to subscription-based bibliographic databases on human sciences or on engineering</li> </ul>		
<b>P9</b>	<p>Research Methodology: The bidder must have experience making and defending submissions to a Human Research Ethics Committee. The bidder should provide copies of up to two Ethics protocols approved in the last 48 months that were submitted by the Principal Investigator or one of the proposed resources.</p> <ul style="list-style-type: none"> <li>• 5 points for each protocol that involved at least twenty human subjects, and at least three experimental conditions, and that was approved in the last 24 months</li> <li>• 4 points for each protocol that involved at least twenty human subjects, and at least two experimental conditions, and that was approved in the last 24 months</li> <li>• 3 points for each protocol that involved at least twenty human subjects, and at least three experimental conditions, and that was approved in the last 48 months</li> <li>• 2 points for each protocol that involved at least twenty human subjects, and at least two experimental conditions, and that was approved in the last 48 months</li> <li>• 1 point for each protocol that involved less than twenty human subjects, that was approved in the last 48 months</li> </ul>	<b>2</b>	<b>10</b>
<b>P10</b>	<p>Research Methodology: The bidder should have experience designing and implementing experimental platforms for human factors research. An experimental platform must include hardware and software to provide and manipulate experimental stimuli for human tasks and to collect and analyze human performance data. The bidder must provide a summary of each experimental platform in response to this criterion, up to a maximum of three summaries. Each summary must be maximum of one page and</p>	<b>2</b>	<b>10</b>



	<p>includes the objective and key capabilities of the platform, and the role(s) of the Principal Investigator and proposed resources in its development.</p> <ul style="list-style-type: none"> <li>• 5 points for a platform that supports all of the following: team research, and automation research, and military research, and that has been used for at least one experiment in the past 36 months</li> <li>• 4 points for a platform that supports at least two of the following: team research, or automation research, or military research, and that has been used for at least two experiments in the past 36 months</li> <li>• 3 points for a platform that supports at least two of the following: team research, or automation research, or military research, and that has been used for at least one experiment in the past 36 months</li> <li>• 2 points for a platform that supports one of the following: team research, or automation research, or military research, and that has been used for at least two experiments in the past 36 months</li> <li>• 1 point for a platform that supports one of the following: team research, or automation research, or military research, and that has been used for at least one experiment in the past 36 months</li> </ul>		
<b>TOTAL</b>		<b>Minimum score</b>  <b>65</b>	<b>Maximum score</b>  <b>125</b>

Annexe B, Base de paiement

Supprimer : dans son intégralité.

Insérer : Révision 1 - Annexe B, Base de paiement

The prices are inclusive in Canadian dollars. Transportation charges, Customs duties and Excise taxes are included, and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

1. To complete the work listed in Annex A, Statement of Work.

Firm Price (not including tax): \$\_\_\_\_\_

Remarque : Le financement maximum fourni par le Canada pour cette invitation à soumissionner est de 120 000,00 \$ (taxes applicable en sus, le cas échéant), y compris les déplacements.

Le montant du contrat sera payé en quatre versements, avec une retenue de 10 %.

Les périodes de paiement se terminent aux dates suivantes :

Le 31 mars 2017;

Le 30 septembre 2017;

Le 31 décembre 2017;

Le 31 mars 2018.