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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

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Issuing Office - Bureau de distribution
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L5B 2N5

Title - Sujet Navy Crew Automation Study	
Solicitation No. - N° de l'invitation W7719-165325/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client W7719-165325	Date 2016-11-02
GETS Reference No. - N° de référence de SEAG PW-\$TOR-302-7179	
File No. - N° de dossier TOR-5-38183 (302)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-11-22	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Berends, Robert	Buyer Id - Id de l'acheteur tor302
Telephone No. - N° de téléphone (905) 615-2465 ()	FAX No. - N° de FAX (905) 615-2060
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Instructions: See Herein

Instructions: Voir aux présentes

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Signature	Date

Amendment is being raised to answer questions to date, extend the closing date, and revise Part 4.1.1.4 Point Rated Technical Criteria and revise Annex B, Basis of Payment.

Questions and Answers:

Q1. - Is the expectation that all of experiments detailed in the SOW will be conducted?

A1. - No. The number of experiments will be negotiable depending on the complexity and duration. The key experiment would be 3b. The experiments in 4b on shift length may or may not occur. If they do, we will have to scale it down and possibly look at vigilance issues rather than subjecting participants to long multiple hour shifts.

Q2. - Will the required measures of performance be provided?

A2. - We have already defined the key metrics that we want to capture at a high level, but not the details. During experimental design, we expected that the Contractor would work with us to develop the metrics further and refine them.

Q3. - Will prototype of working automation concepts be provided so that they can be readily integrated into existing contractor test beds?

A3. - We have identified some experimental platforms to run experiments and they have pre-defined the automation capabilities. They will likely need some tweaking so that we can mimic the automation on the Halifax Class frigates, but the core functions will be already present. We don't expect a high level of effort here from the Contractor, but their insight and suggestions on changes will be expected.

Q4. - Given that operational decision making is a highly complex skill that depends on deep training and experience, what are the expectations concerning the availability of suitable test personnel?

A4. - Currently the plan is to use naval personnel familiar with the main task to run as participants so we hope the core training on the primary tasks will be negligible. However, we still expect a substantial amount of training to familiarize participants with the test bed GUI, the nuances of the experimental task, and training to limit the negative transfer that might occur with using expert participants.

Q5. - How many points will be awarded for bullets 4 and 5?

A5 – See revised Part 4.1.1.4.

Q6. – Are transportation/travel charges included or will be in addition to the \$120k maximum funding.

A6. - Travel charges to the locations suggested were to be included within the \$120K

Q7. - Is Canada open to more frequent milestone payments or progress payments?

A7. – Yes, see revised Annex B, Basis of Payment.

Q8. - Do the experimental participants have to possess specific knowledge, skills or abilities in order to be selected (e.g., RCN operator with past experience in the Halifax Class Frigate Ops

room conducting combat functions)? If RCN personnel are required, will DRDC assist with accessing these individuals?

A8. - DRDC will be responsible to accessing RCN individuals to run as participants.

Q9. - Will the new HCM automation be provided by DRDC for subsequent integration into the experimental test bed?

A9. - We will be providing the test beds to run the participants and it is the hope that we can modify the native automation that is part of these test beds to simulate the automation in HCM.

At 4.1.1.4 Point Rated Technical Criteria:

Delete: In its entirety.

Insert: Revision 1 – 4.1.1.4 Point Rated Technical Criteria

POINT-RATED EVALUATION CRITERIA		Minimum	Maximum
P1	<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"> • 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). • 1 point for each conference paper on human factors and automation • 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.) 	6	20
P2	<p>Scientific knowledge: The Principal Investigator should have experience conducting human factors research on teams, as evidenced by peer-reviewed publications. The bidder must identify specific publications in response to this criterion.</p> <ul style="list-style-type: none"> • 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). • 1 point for each conference paper on human factors and teams 	2	15

	<ul style="list-style-type: none"> 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.) 		
P3	<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"> 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). 2 points for each journal paper on human factors and work processes 1 point for each conference paper on human factors and worker characteristics 1 point for each conference paper on human factors and work processes 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.) 	2	15
P4	<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> <ul style="list-style-type: none"> 1 point if project includes literature review 1 point if project includes development of experimental platform 1 point if project includes a human experiment 1 point if project includes a second human experiment <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</p>	0	10

	points; these two projects together will score five points out of ten).		
P5	<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"> • 3 points if project is in support of the Royal Canadian Navy • 2 points if project is in support of an allied Navy (e.g., Five Eyes, NATO) • 1 point if project is in support of civilian maritime applications 	0	10
P6	<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"> • 5 points for a PhD in Engineering, Psychology, or Computer Science, and either one human factors course or one peer-reviewed human factors publication • 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 • 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 • 3 points for a Bachelor's degree in Engineering, Psychology, or Computer Science, and two human factors courses • 2 points for a Bachelor's degree in Engineering, Psychology, or Computer Science, and one human factors course 	5	20

	<ul style="list-style-type: none"> • 1 point for a Bachelor’s degree in Engineering, Psychology, or Computer Science, and no human factors course <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>P7</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>Separate areas – 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>Distributed Teams – are defined such that at least two members are located in separate areas.</p> <ul style="list-style-type: none"> • 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. • 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 	<p>4</p>	<p>10</p>

	<p>support distributed teams, and hardware and software for data collection and analysis.</p> <ul style="list-style-type: none"> • 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 • 7 points if the facility has four or more standalone computers for human experiments, and hardware and software for data collection and analysis • 6 points if the facility includes two or more networked computers for human experiments, and hardware and software for data collection and analysis • 5 points if the facility has three or more standalone computers for human experiments, and hardware and software for data collection and analysis • 4 points if the facility has two or more standalone computers for human experiments, and hardware and software for data collection and analysis • 2 points if the facility has two or more standalone computers for human experiments, and no hardware or software for data collection and analysis • 0 points if the facility has less than two computers, and no hardware or software for data collection and analysis 		
P8	<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> <ul style="list-style-type: none"> • 5 points if bidder has access to a subscription-based bibliographic databases on human sciences and engineering, and access to professional librarians for support • 3 points if bidder has access to subscription-based bibliographic databases on human sciences and engineering • 1 point if bidder has access subscription-based databases on human sciences only or on engineering only • 0 point if bidder has no access to subscription-based bibliographic databases on human sciences or on engineering 	1	5
P9	<p>Research Methodology: The bidder must have experience making and defending submissions to a Human Research Ethics Committee. The</p>	2	10

	<p>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"> • 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 • 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 • 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 • 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 • 1 point for each protocol that involved less than twenty human subjects, that was approved in the last 48 months 		
<p>P10</p>	<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 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"> • 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 • 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 • 3 points for a platform that supports at least two of the following: team research, or automation research, or 	<p>2</p>	<p>10</p>

	<p>military research, and that has been used for at least one experiment in the past 36 months</p> <ul style="list-style-type: none"> • 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 • 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 		
TOTAL	Minimum score	Maximum score	
	65	125	

At Annex B, Basis of Payment:

Delete: In its entirety.

Insert: Revision 1 - At Annex B, Basis of Payment

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): \$_____

Note: Canada's maximum funding available for the contract resulting from the bid solicitation is \$120,000.00 (Applicable Taxes extra, as appropriate), including travel.

Contract amount will be paid in 4 payments with a 10% holdback.

Payment periods end on the following dates:

March 31, 2017;

September 30, 2017;

December 31, 2017; and

March 31, 2018.