Amendment 004 to the Request for Proposal is raised to answer questions and make modifications.

All other terms and conditions of the solicitation remain the same.

A proposal already submitted may be amended prior to closing time by sending the amended correspondence to Bid Receiving, the envelope/fax bearing the proposal No. W8476-18ADIS/D and the closing date of March 31st, 2021.

QUESTIONS

Question 1:
Can the Canadian Government please explain the highlighted regions in the Labour Term in the financing spreadsheet?

Answer 1:
The highlighted categories have been added from previous RFP submissions.

Question 2:
We have noticed summing errors and pricing requirement discrepancies from the original pricing sheet? For example: Training has a requirement for Firm Pricing for Year 2 & 3 but there is also Option Periods for Year 2 and 3.

Answer 2:
In ATTACHMENT 1 TO PART 3 Excel spreadsheet under Tab Training: Government of Canada is requesting a financial submission for 2 separate contracts. In the first table called Acquisition: Government of Canada is requesting a submission for a three (3) year contract. The second table called In-Service Support is the second contract for a one (1) initial term of one year and four (4) option term of one year.

Question 3 :
The sum tab for option periods for training shows A + B + C + E (should D be there?)

Answer 3 :
You are correct. Column D forms part of the total of (2) for the In-service Support. In ATTACHMENT 1 TO PART 3 Excel spreadsheet under Tab Training, cell # : H26; should read as follow: (A+B+C+D+E)

Question 4 :
The R&O tab has Firm Pricing for Year 2 & 3, but it also shows in the Option Period. Is Option Year 1 actually Year 4? These columns have changed from the original pricing sheet.

Answer 4:
In ATTACHMENT 1 TO PART 3 Excel spreadsheet under Tab R &O : the first table is the initial period of the contract of 3 years. The second table is the option terms for a duration of four (4) one (1) year term.

Question 5:
If does not have some of the positions listed on the Labour tab (eg Database Administrator) how do we represent them?

Answer 5 :
Insert "0" to identify the position as not represented.

Question 6:
And why are some of those titles highlighted and some aren't?

Answer 6:
The highlighted categories have been added from previous RFP submissions.

Question 7 :
Industry cannot meet these Mandatories: M13, M28, M38 & M40 - MIL-STD-464C – can an equivalent to this standard be accepted? M39 – Please clarify the requirement of "Control of E3" M58 - In relation to the GFE

Answer 7:
M13: This is a multi-part mandatory that has been met previously using the Verification Criteria in the RFP. Please note that some Verifications require only a CoC, Narrative or Preliminary Proof, which is less stringent than a Test Report.

M28: This is a multi-part mandatory that has been met previously using the Verification Criteria in the RFP. Please note that some Verifications require only a CoC, Narrative or Preliminary Proof, which is less stringent than a Test Report.

M38 & M40: - MIL-STD-464C – can an equivalent to this standard be accepted? Yes, but please note that per Vol 1 page 38, Section 1 "ATTACHMENT 2B TO PART 4, Section 2 and Appendix AA to Annex A of Volume 2, System Requirements Specification (SysRS) indicate the standards to be followed in order to verify requirements. Those standards are typically US-MIL-STDs. DND expects that submitted results and reports that demonstrate compliance with requirements were obtained using the indicated references. In case a Bidder submits results following
different standard, DND will, at its sole discretion, assess the suitability of the results to evaluate
compliance or not. Simulations and extrapolations will only be considered if based on ph ysical testing. Bidders are strongly encouraged to follow the standards indicated in the SysRS."

M39: Please clarify the requirement of “Control of E3” Per MIL-STD-464C section 3.4 Electromagnetic environmental effects (E3), it means that the ADIS will be able to control "The impact of the electromagnetic environment (EME) upon the operational capability of military forces, equipment, systems, and platforms. E3 encompasses the electromagnetic effects addressed by the disciplines of electromagnetic compatibility (EMC), electromagnetic interference (EMI), electromagnetic vulnerability (EMV), electromagnetic pulse (EMP), electronic protection (EP), electrostatic discharge (ESD), and hazards of electromagnetic radiation to personnel (HERP), ordnance (HERO), and volatile materials (HERF). E3 includes the electromagnetic effects generated by all EME contributors including radio frequency (RF) systems, ultra-wideband devices, high-power microwave (HPM) systems, lightning, precipitation static, etc."

M58: In relation to the GFE Please note that some Verifications require only a CoC, Narrative or Preliminary Proof, which is less stringent than a Test Report. For this requirement, CAN is willing to accept a CoC that the bidder supplied kit meets these specifications.

Question 8:
In regards to the DRDC lab testing:
F-125 and F-22 are banned substances not permitted for production or import in the European Union. As such, they cannot be tested to be added to the sensor library.

Answer 8:
Canada has provided the spectra of the substrates with the RFP and bidders are encouraged to refer to these spectra to prepare for DRDC lab test. Bidders are not required to demonstrate ability to detect these substances for the bid submission.

Question 9:
In regards to the List of Mandatory Chemical Warfare Agents “Liquid or Vapor” is given as the physical state but a detection of liquids is not possible.

5.6.6 Field Tests -
Please confirm the GFE (radios and computers) are excluded from this assessment as we cannot control the quality

5.6.7 Emissions Security (EMSEC)/TEMPEST Requirements
Please confirm the GFE (radios and computers) are excluded from this assessment as we cannot control the quality

Answer 9:
5.6.6 Field Tests: Confirmed. For the purpose of the Bid Evaluation, the GFE is not included. Canada will work with the successful bidder to ensure field test performance of the entire system including GFE after Contract Award.

5.6.7 Emissions Security (EMSEC)/TEMPEST Requirements

Confirmed. For the purpose of the Bid Eval, the GFE is not included. Canada will work with the successful bidder to ensure EMSEC/TEMPEST requirements of the entire system including GFE after Contract Award.

Question 10:

The following points should be considered when performing laboratory tests that are intended to simulate field tests:

a) Aperture of the Device: The detectable cloud size depends on the divergence and the aperture size D (entrance window or lens diameter) of the detection system. For scanning systems, one should note that high scanner velocities have an impact on the instrument's effective divergence such that slightly larger cell diameters may be required.
b) Impact from gascell-setup: Window reflections, thermal inhomogeneities, pointing inaccuracies and gas filling issues can lead to smaller infrared signals than calculated from the expected gascell concentration and measured temperatures. An accurate approach would comprise a measurement of the emitted infrared spectrum from the setup instead of estimating it from the concentration and temperatures.
c) Cloud movement, cloud detection on a larger field of regard: In practice, a remote detection system should detect clouds that can appear at different locations on a larger field of regard. This can be quite well simulated by placing two (or more) cells in different corners of the laboratory and by letting the detection system monitoring the complete area in between. An additional slow movement of the gas cells during the monitoring would be even more realistic.
d) Detection time and statistics: The required time-to-detect of 2 minutes is likely based on the reasonable assumption, that a cloud will be present for a certain time period. Such a time-to-detect for a fixed pointing direction (like in the laboratory setup) would allow a detector to integrate the signal for 2min, which is usually not proper for the use in the field. In the field, it is essential that the detecting system covers the desired field of regard (the monitored area) within the time period for which a cloud is typically present. The laboratory setup with a time-to-detect of 2 minutes for a fixed pointing direction will hardly prove that. Once again, the monitoring of a larger field of regard during the laboratory tests will be more realistic.
e) Scoring system: To our knowledge the test scoring system with an achievement rate of 14/14, 21/22 or 28/30 does not proof the SysRS ID 14: "*probability of successful detection and identification of at least 80% (95% confidence level)*". This requirement would be assigned to smaller achievement rates.
f) Atmospheric influences: Interferences from atmospheric gases can hardly be simulated in laboratory tests. However their influence should at least be theoretically analyzed to compare measurement approaches of different systems (as part of the initial Compliance Report in section 2 A of Attachment 2B for Part4).

Answer 10 :

The following points should be considered when performing laboratory tests that are intended to simulate field tests:

a) Aperture of the Device: The target, which simulates a 50-m cloud at 3 km, will be the same for all system tested and corresponds to an internal ADIS detection goal. The

manufacturer should ensure optimal system parameters, including scanning rate and fore optics configuration if possible, for this scenario.

b) Impact from gas cell-setup: Gas cell windows have a high transmittance, and the cell could be aligned with a small angle to reduce direct reflections. Thermal inhomogeneities should be negligible or at least very small compared to the thermal contrasts tested. They will also be the same for all tested systems. Temperatures for the gas cell and blackbody plate will be recorded. The whole setup will be tested against non-competing sensors to ensure detectable signal from the target, and the gas cell will be characterized in transmittance using a laboratory spectrometer before and after each round of tests to ensure fairness.

c) Cloud movement, There are multiple ways to make the laboratory test more complex or realistic. However, this adds parameters which must then be carefully controlled. The test was designed to be as simple as possible, and only test for the sensitivity of the sensor, in order to guarantee fairness and reliability.

d) Detection time and statistics: . It is agreed that integrating a static signal for 2 min does not constitute a realistic detection scenario. However, it is suitable to determine the sensitivity of the sensor, which is the goal of this laboratory test. Please note that the scoring table include a bonus if detection is claimed (while still correct) within 1 min instead of 2 min..

e) Scoring system: The System must have a 80% probability of detection and identification (or better), verified to a 95% confidence level. While the probability of detection is a property of the System, the confidence level is a property of the statistical test used to demonstrate the probability of detection. The test is composed of a series of pass / fail trial events, in which a correct identification is a pass, and a fail otherwise. The output of the test will thus follow a binomial distribution (1) of mean N*Pd, where N is the number of events and Pd is the probability of detection of the system. Given a binomial distribution, we can estimate Pd by simply computing the ratio of successes. However, we require to be 95% certain of our estimate, and there is a greater than 5% probability that a system with Pd < 0.8 obtains 8/10 in a trials with 10 events. We must know how many trial events N to perform, and how many failures K to allow, to get a 95% confidence level.

In general, for a binomial distribution, the probability of a system failing exactly K events out of N is given by:

Pr(p; N, K) = C(N, K) * p^K * (1-p)^(N-K)

where p = 1 - Pd is the probability of failure and C(N, K) is the binomial coefficient, i.e. the number of possible combinations for K failures out of N events.

The probability that a system would have at most K failures out of N events given p = 1-Pd is thus:

sum(k=0..K) Pr(p; N, k)

We can use this formula to find N and K such that if achieved, there is only 5% chances that the system has Pd below 0.8. By setting p = 0.2 in the formula above and testing values of N and K, ensuring the result is below 0.05, we find:

for no failure (K = 0), N must be at least 14;

for at most one failure (K = 1), N must be at least 22;

for at most two failures (K = 2), N must be at least 30.

This may seem a rather strict interpretation of the confidence interval, but other interpretations are even more stringent. For example, using the Clopper-Pearson method to compute confidence intervals (2), we would need either 17/17, 25/26 or 32/34 to ensure a lower bound of 0.8 for Pd at a 95% confidence level (3). Under the Clopper-Pearson method, the required 14/14, 21/22 and 28/30 rather offers a 90% confidence level.

To specifically answer the bidder's question, over 100 trial events, we would require 91/100 under our method. The Clopper-Pearson method would become slightly less restrictive, allowing 89/100. Practical considerations and limits on the time required to perform these trials favor a lower number of trial events.

(1) See https://en.wikipedia.org/wiki/Binomial_distribution

(2) See https://en.wikipedia.org/wiki/Binomial_proportion_confidence_interval#Clopper%E2%80% 93Pearson_interval

(3) See this handy calculator for the Clopper-Pearson confidence interval: https://danielsoper.com/statcalc/calculator.aspx?id=85

f) Atmospheric influences: It is agreed that the effect of a thick atmosphere (contributions from CO2, H20 and O3 in particular) are not tested using the laboratory testing methodology. The capacity of a system to operate over long atmospheric ranges should be demonstrated using test reports documenting successful detections.

Question 11 :
Could you also provide the ITB transaction sheet specific to this project?

Answer 11:
Bidders can contact the Contracting Authority to directly receive an electronic version of the ITB Transaction sheet.