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# LETTER OF INTEREST
# LETTRE D'INTÉRÊT

| **Title - Sujet** |
|---|
| JFM - RFI |

| **Solicitation No. - N° de l'invitation** | **Date** |
|---|---|
| W8476-195949/A | 2019-01-17 |

| **Client Reference No. - N° de référence du client** | **GETS Ref. No. - N° de réf. de SEAG** |
|---|---|
| W8476-195949 | PW-$$QD-035-27151 |

| **File No. - N° de dossier** | **CCC No./N° CCC - FMS No./N° VME** |
|---|---|
| 035qd.W8476-195949 | |

| **Solicitation Closes - L'invitation prend fin** | **Time Zone** |
|---|---|
| at - à   **02:00 PM** | **Fuseau horaire** |
| on - le 2019-04-26 | Eastern Standard Time EST |

**F.O.B. - F.A.B.**

Plant-Usine: ☐    Destination: ☐    Other-Autre: ☐

| **Address Enquiries to: - Adresser toutes questions à:** | **Buyer Id - Id de l'acheteur** |
|---|---|
| Weronski, Radek | 035qd |

| **Telephone No. - N° de téléphone** | **FAX No. - N° de FAX** |
|---|---|
| (819) 420-1774 (   ) | (   )   - |

**Destination - of Goods, Services, and Construction:**
**Destination - des biens, services et construction:**

Specified Herein
Précisé dans les présentes

**Comments - Commentaires**

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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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**

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Defence Communications Division. (QD)
11 Laurier St./11, rue Laurier
Place du Portage, Phase III, 8C2
Gatineau, Québec K1A 0S5

**Canada**

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**PART 1 – GENERAL INFORMATION**

1.1.     Purpose and Objectives of Industry Engagement

1.1.1.    The purpose of this Request for Information (RFI) is to inform Industry of a possible upcoming competitive procurement process for the Department of National Defence's (DND) requirement to procure, integrate, and support a new Joint Fires Modernization (JFM) capability.

1.1.2.    Public Services and Procurement Canada's (PSPC) intent for this RFI is to engage Industry in a consultative process by seeking Industry feedback via the responses to questions identified herein. In addition, DND has a requirement to understand the current Industry capabilities, sustainment and affordability of JFM on behalf of Canada. The main objectives of this consultative process are:

   a)  Provide Industry with initial information on the planned procurement process related to the JFM project;
   b)  Invite industry representatives to an Industry Day and one-on-one sessions;
   c)  Request preliminary input for discussion on Industry Day;
   d)  Request information and feedback regarding indicative cost estimates;
   e)  Determine the capability of industry to satisfy the project requirements;
   f)  Obtain industry feedback on any issues that would impact their ability to bid on a resulting solicitation and/or deliver on the department's requirements; and
   g)  Inform and engage Industry on the Industrial and Technological Benefits (ITBs) Policy, including Value Proposition (VP).

1.1.3.    The objective of requesting Industry's proposed solutions is to ensure that the Canadian JFM requirement continues to develop in line with the capabilities of Industry. To ensure that the project proceeds with an achievable scope and budget, the information received from Industry will be used to develop accurate costing models based on the equipment and sustainment needs recommended by Industry. To facilitate the accuracy of the models, Canada requires detailed performance data on each system component, their sustainment needs, and any integration complexities or constraints that must be considered when scaling the system to evaluate various operation scenarios. These include factors such as, but not limited, to simultaneous targets, increased threat frequency, increased coverage areas, etc.

1.1.4.    The objective of requesting Indicative or Rough Order of Magnitude (ROM) pricing associated to the respondent proposed technical solution is to ensure a level of accuracy which will allow Canada to prepare documentation for further JFM Project approval gateways. In addition to the various unit costs associated to the suggested solution for items such as, but not limited to, Command & Control (C2) and targeting software, tactical equipment, and training systems, the project needs to obtain from respondents associated costing for activities, reports, and sustainment associated with delivery and maintenance of equipment.

1.1.5.    Interested firms are encouraged to review the documentation attached to the RFI and provide comments and/or questions, in writing, to the PSPC Contracting Authority identified herein at section 1.6.

1.2.     Requirement

1.2.1.    Canada has a requirement to acquire a new JFM capability. JFM will provide tactical Joint Fires Enablers with modern equipment and software to increase the speed, accuracy, and responsiveness of the planning and coordination of the full spectrum of fires and effects (lethal and non-lethal, via munition and non-munition means) and support the deliberate and dynamic targeting cycles. JFM will implement a digital fires solution to improve the decision-action cycle by digitally linking all sensors, effectors, and C2 assets. It will enable real-time sharing of the Common Operating Picture (COP) including targets, allied locations, and C2 information (boundaries, control measures, orders, etc.). It will also seek to deliver a networked and accredited synthetic training environment in order to ensure the high standard of training, proficiency, and currency that this activity demands.

Deliverables will include:

- Integrated Fires C2 System: comprising of hardware, software, and communications bearers. The C2 and targeting systems will improve response time and precision when coordinating the application of fires and effects in the land domain;

- Tactical Equipment: the delivery of digitized Joint Fires tactical systems integrated into the C2 systems that will increase the range, accuracy, and speed at which Joint Fires Enablers can detect, acquire, allocate, and engage targets and coordinate the delivery of effects; and

- Training Systems: the procurement of realistic, immersive, and accredited simulators will improve individual and collaborative training. This outcome will reduce the requirement for live training, resulting in a more efficient use of Canadian Air Force (CAF) resources and less reliance on expensive assets such as aircraft support and live artillery ammunition.

1.3.    Potential Scope and Constraints

1.3.1.    A National Security Exception and/or National Security Exception – Special Contracting Caveat may apply to this procurement process.

1.3.2.    The RFI is not subject to the Controlled Goods Program, however any resulting competitive process will be. For information pertaining to the Controlled Goods Program, please refer to the Public Services and Procurement Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/dmccgd/ index-eng.html) website.

1.3.3.    The Federal Contractors Program for Employment Equity (FCP-EE) will apply to the upcoming competitive procurement process. Further details on the FCP-EE will be communicated on https://buyandsell.gc.ca/ as part of the upcoming competitive procurement process.

1.3.4.    There are no security requirements associated with this RFI, however, there may be security requirements associated with any resulting competitive procurement process. Additional information on the security requirements will be communicated on https://buyandsell.gc.ca/ as part of the upcoming competitive procurement process.

1.3.5.    Should Industry require information on personnel and organization security screening or security clauses, please refer to the Canadian Industrial Security Directorate (CISD), Industrial and Security Program of Public Services and Procurement Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html) website.

1.3.6.    Any additional information on the potential scope and constraints will be communicated on https://buyandsell.gc.ca/ as part of any competitive process.

1.4.    Legislation, Trade Agreements, and Government Policies

1.4.1.    The following is a list of some legislation and government policies that will govern the upcoming competitive procurement process:

     a)   Defence Production Act (DPA)
     b)   Controlled Goods Program (CGP)
     c)   Federal Contractors Program for Employment Equity (FCP-EE)
     d)   Government Contract Regulations (GCR)
     e)   PSPC Policy on Green Procurement

1.4.2.    Any additional information pertaining to Legislation and Government Policies will be communicated on https://buyandsell.gc.ca/ as they become available throughout the period of this RFI or as part of any resulting competitive procurement process.

1.5.    Schedule

1.5.1.    The following is the tentative schedule associated with both the RFI and potential competitive procurement process:

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a) Release of RFI: 18 January 2019
b) Industry Day: 19 February 2019
c) RFI Closing date: 26 April 2019
d) Release potential RFI #2: 2020
e) Release potential draft Request for Proposals (RFP): 2021
f) Release potential final RFP: 2022
g) Departmental and Government Approvals: 2024
h) Potential Contract Award: 2024
i) First Delivery: Spring 2026

1.5.2.   Any changes to the tentative schedule will be communicated on https://buyandsell.gc.ca/ as they become available throughout the period of this RFI.

1.6.   PSPC Contracting Authority

1.6.1.   All information, communication or correspondence must be directed to the Contracting Authority ONLY. No other member or representative of the Government of Canada can be informed, challenged or otherwise communicated with, including carbon copy or blind carbon copy on any verbal, emails or written correspondence regarding this RFI.

1.6.2.   Any correspondence must be directed, in writing, in either official language of Canada, to the PWGSC Contract Authority identified below, preferably via email:

Darren Langdon
Contracting Authority
Public Services and Procurement Canada
975 Saint-Joseph Boulevard
C/O DND/DASPM – 4th floor SD04
Gatineau, QC  K1A 0K2

E-mail: darren.langdon@tpsgc-pwgsc.gc.ca
Phone: 819-639-3772

1.6.3.   Changes to this RFI may occur and will be advertised on the Government Electronic Tendering System, https://buyandsell.gc.ca/.

1.6.4.   Canada asks interested parties to visit https://buyandsell.gc.ca/ regularly to check for changes, if any.

1.7.   Industry Interaction

1.7.1.   To ensure a successful procurement process for the provision of JFM, Canada intends to engage Industry in a consultative process. The consultative process associated with this RFI includes specific questions aimed to help determine the viability and capabilities of such a scope and may include follow-up questions.

An Industry Day will take place at 13:00 pm EST on 19 February 2019 at 455 de la Carrière Boulevard, Gatineau. The Industry Day is intended to be an open forum. It will allow Canada to present industry representatives with information about the JFM project and communicate high-level equipment capability and sustainment requirements. It will also provide a venue for industry representatives to ask questions and seek information required to gain a sound understanding of Canada's business needs. Representatives from Public Services and Procurement Canada (PSPC), the Department of National Defence (DND), and Innovation, Science and Economic Development Canada (ISEDC) will lead Industry Day presentations and discussions on procurement requirements, technical requirements, and industrial technological benefits, respectively. Topics for discussion may include potential procurement issues and opportunities for resolution, innovative solutions, and the overall procurement and sustainment strategies.

1.7.2.  Industry Day will be followed by One-on-One meetings between Business and Government at 975 Boulevard St-Joseph, Gatineau, on 20, 21 and 22 February 2019. These meetings will be an opportunity for industry representatives to provide further information and seek further clarification on all topics associated with the RFI and potential procurement process. Canada will assign final meeting times to respondents prior to 19 February 2019.

1.7.3.  Canada's intent in seeking Industry feedback is mainly to solicit feedback and information on the following topics:

> a)  Proposed solutions from Industry to meet the JFM Preliminary Statements of Requirements (PSORs) and sustainment requirements;
> b)  Establishing indicative cost estimates associated with potential solutions;
> c)  Additional sustainment requirements - including items such as Intellectual Property (IP) rights, supply chain collaboration, etc. for a more comprehensive sustainment;
> d)  To understand current market capacity and interest;
> e)  Understanding industrial capabilities relevant to the JFM platforms;
> f)  Key procurement steps, including development of the RFP; and
> g)  Application of the Industrial Technological Benefits (ITB) policy including Value Proposition (VP).

1.7.4.  All parties interested in attending the Industry Day or One-on-One meetings must notify the Contracting Authority no later than 5:00 pm on 08 February 2019. Parties must indicate in writing the name, position and contact information for each and every participant attending and indicate if participation will be for the Industry Day, One-on-One meetings, or both.  One-on-One meetings will take place in 30 min slots between the hours of 8:00 am and 5:00 pm on 20, 21 and 22 February. Companies can indicate their preferred time and date when booking their One-on-One meeting with the project team but these will be limited to no more than 60 minutes. Meeting times will be allotted in the order of receipt, however if the preferred time is not available, the Contracting Authority will provide alternate times to choose from.

1.7.5.  All Questions and Answers throughout the engagement process will be recorded and posted on https://buyandsell.gc.ca/.

1.7.6.  Participants will be asked to submit any additional feedback to the Industry Interaction, in writing, to the PSPC Contracting Authority, identified herein at Section 1.6, on or before 26 April 2019.

1.7.7.  Respondents should use the Annexes C through F provided as guides/templates for their response.

1.7.8.  All submitted information, comments, and/or questions must be based solely on the documentation herein and Industry should not reference any other past procurement process.

1.7.9.  Non-attendance at any Industry Day or One-on-One Sessions will not preclude any firm from bidding on this requirement should a follow-on solicitation be issued.

1.8.  Notes to Interested Parties

1.8.1.  This RFI is neither a call for tender nor an RFP, and no agreement or contract for the procurement of the requirement described herein will be entered into solely as a result of this RFI. The issuance of this RFI is not to be considered in any way as a commitment by Canada nor as authority to potential Respondents to undertake any work that could be charged to Canada.

1.8.2.  This RFI is not to be considered as a commitment to issue a subsequent solicitation or award contract(s) for the work described herein. Canada does not intend to award a contract on the basis of this notice or otherwise pay for the information solicited. Any and all expenses incurred by the Respondent in pursuing this opportunity, including the provision of information and potential visits, are at the Respondent's sole risk and expense.

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1.8.3.   Any discussions on this subject with project staff representing DND, PSPC, ISEDC or any other Government of Canada representative or other personnel involved in project activities, must not be construed as an offer to purchase or as a commitment by Canada.

1.8.4.   Respondents may provide documents / information / data collected as commercial-in-confidence (and if identified as such, will be treated accordingly by Canada). However, Canada reserves the right to use the information to assist them in drafting performance specifications and for budgetary purposes in consultation with both national and international stakeholders. Requirements are subject to change, which may be as a result of information provided in response to this RFI. Participants are advised that any information submitted to Canada in response to this RFI may or may not be used by Canada in the development of the potential subsequent RFP. The issuance of this RFI does not create an obligation for Canada to issue a subsequent RFP and does not bind Canada legally or otherwise, to enter into any agreement or to accept or reject any suggestions.

1.8.5.   Respondents are encouraged to clearly identify, in writing, in the information they share with Canada, any information they feel is commercial-in-confidence, proprietary, third party, or personal. Please note that Canada may be obligated by law (e.g. in response to a request under the Access to Information and Privacy Act) to disclose proprietary or commercially-sensitive information concerning a Respondent (for more information: http://laws-lois.justice.gc.ca/eng/acts/a-1/).

1.8.6.   Respondents are asked to identify, in writing, if their response, or any part of their response, is subject to the Controlled Goods Regulations.

1.8.7.   Participation in this RFI is encouraged but is not mandatory. There will be no shortlisting of potential suppliers for the purposes of undertaking any future work as a result of this RFI. Similarly, participation in this RFI is not a condition or prerequisite for the participation in any potential subsequent solicitation.

1.8.8.   Respondents will not be reimbursed for any cost incurred by participating in this RFI.

1.9.   Closing date for the Request for Information

1.9.1.   The RFI (Industry Engagement) closing date is currently planned for 26 April 2019. Respondents are asked to submit their responses to the questions posed in this RFI by 2:00 pm EST on 26 April 2019.

1.10.   Attached Documents (Parts 2 and 3)

> Annex A – Joint Fires Modernization Description
> Annex B – Sustainment
> Annex C – Industrial Technological Benefits / Value Proposition
> Annex D – Costing Requirements / Questions
> Annex E – JFM High Level Mandatory Requirements and Questions
> Annex F – JFM Sustainment Questions
> Annex G – Acronyms
> Annex H – Non-Disclosure Agreement

1.11.   Government Furnished Information

1.11.1   A Joint Fires Scenario has been prepared by the project team (Appendix 1 to Annex A).  It is identified as Government Furnished Information (GFI).  These documents are available from the Contracting Authority on request. This request must be accompanied by a fully executed original copy of the Non-disclosure Agreement (NDA) as per the template in Annex H.

1.11.2   Respondents must contact the Contraction Authority identified in section 1.6 to request GFI.

1.12.   Submission of Responses

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1.12.1   Respondents are requested to provide their responses to the Contracting Authority listed in section 1.6 above, only, in either hard copy form or soft copy on CD/DVD or cloud service. Fax and e-mail submissions will not be accepted.

**<u>NOTE:</u>**
The use of USB drives/sticks are not authorized within many Government of Canada departments and as such, respondents are asked NOT to provide USB drives containing or as part of their response.

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## PART 2 – JOINT FIRES MODERNIZATION REQUIREMENTS

Annex A – Joint Fires Modernization Description
Annex B – Sustainment Approach

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**ANNEX A – JOINT FIRES MODERNIZATION DESCRIPTION**

Requirements

1.1.    Overview

1.1.1.    The Canadian Armed Forces (CAF) requires a tactical joint fires system that can integrate, synchronize and coordinate the application of fires and effects digitally in a joint environment. Currently the Canadian Army (CA) has a limited ability to digitally share fires, effects, and targeting information with other CAF elements (Army, Navy, Air Force and Special Operations Forces) and coalition partners. A digitized system of systems approach is necessary to rapidly and accurately share information and integrate fires resources. Through this implementation, the Joint Fires Modernization (JFM) capability will provide tactical Joint Fires Enablers (e.g. Forward Observation Officers (FOO), Joint Terminal Attack Controllers (JTAC), Fire Support Coordination Centres (FSCC), etc.) with modern equipment and software to increase speed, accuracy, and responsiveness in the coordination of fires and effects. This investment will provide the CA with the opportunity to better leverage its own integral assets for training as well as those of the CAF and coalition partners in order to optimize effects on targets[1] in support of land operations.

1.1.2.    The CA's legacy capabilities have not evolved technologically enough to meet the demands of operating in complex and dynamic multinational environments. In addition to coordinating effects from various elements of the CAF, a modern army must be capable of operating with coalition assets. Many of Canada's greatest allies, as well as members of the North Atlantic Treaty Organization (NATO), have transitioned from analog to digital fires information to improve the speed, accuracy, and security of sharing information. Moving forward, the CA needs a digital fires capability to increase interoperability with these Allies. Failure to comply with digital coalition standards will further inhibit the CAF's ability to operate with other elements and coalition partners in the near future.

1.1.3.    The CAF also needs to improve the decision-action cycle for the coordination of joint fires. This can be achieved by digitally connecting sensors to effectors and providing an integrated command and control (C2) system in order to synchronize firepower and the full spectrum of effects (both lethal and non-lethal, via munition or non-munition) in support of deliberate and dynamic targeting during combat operations.

1.2.    Introduction

1.2.1.    The CA is a highly professional force that is agile, scalable, and responsive, providing the Canadian Government with a range of military capabilities on land. The Army operates at the brigade group level, executing joint campaigns with a critical mass of troops on the ground that operate in a combined role to provide the joint force with its requisite firepower, protection, C2, mobility and sustainability. The brigade group is the corner stone of the Army but is only capable of providing the above-mentioned effects if adequately equipped to permit the coordination, synchronization, and application of fires and effects (i.e. artillery, precision guided munitions (PGM), air strikes, and naval gunfire) in support to land operations.

1.2.2.    Strong, Secure, Engaged (SSE): Canada's Defence Policy outlines the level of ambition for the CAF and presents a new strategic vision for defence. SSE also states that the CAF will be prepared to simultaneously deploy to two different theatres of operation, including one as a lead nation. This predicates the need for the CA to have enough assets to support simultaneous operations of 500 to 1500 personnel in two different operational theatres or one brigade group of up to 4800 personnel. In order to meet the objectives laid out in SSE, Canada needs an agile, multi-purpose, and combat-ready military, operated by highly trained, well led, and well-equipped soldiers. SSE Initiative 42 captures the Government of Canada's (GoC) commitment to modernize land-based C2, intelligence, surveillance, reconnaissance, and target acquisition systems. The JFM project will deliver on this commitment through the acquisition of improved digital fires software to facilitate planning, data transfer, tactical equipment, simulation, and communications infrastructure. This will enhance interoperability within the CAF, within NATO, America, Britain, Canada, Australia, New Zealand Armies

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[1] Definition of a Target: An area, structure, object, person or group of people against which lethal or non-lethal capability can be employed to create specific psychological or physical effects. (Source: Defence Terminology Bank & NATO - AAP-6 – NATO GLOSSARY OF TERMS AND DEFINITIONS)

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(ABCANZ), and other Allies, while assisting the CA to modernize land-based C2, intelligence, surveillance and reconnaissance systems.

1.3.    Missions

1.3.1.    The GoC articulates eight core missions that the CAF should be able to undertake for the protection of Canada and Canadians and the maintenance of international peace and stability.

  I.    Detect, deter and defend against threats to or attacks on Canada;

  II.    Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through North American Aerospace Defence (NORAD);

  III.    Lead and/or contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability;

  IV.    Lead and/or contribute to international peace operations and stabilization missions with the United Nations, NATO and other multilateral partners;

  V.    Engage in capacity building to support the security of other nations and their ability to contribute to security abroad;

  VI.    Provide assistance to civil authorities and law enforcement, including counter-terrorism, in support of national security and the security of Canadians abroad;

  VII.    Provide assistance to civil authorities and non-governmental partners in responding to international and domestic disasters or major emergencies; and

  VIII.    Conduct search and rescue operations.

1.3.2.    The capabilities provided by JFM are applicable to core missions 1 through 6 but may also support non-munition effects applications in missions 7 and 8. For example, JFM would support mission 7 by facilitating Joint Fires Enablers on the ground to more rapidly and accurately coordinate the aerial delivery of humanitarian aid packages dropped by the Royal Canadian Air Force (RCAF).

1.3.3.    To deliver these specific operational outputs at the assigned responsiveness levels, the CAF must possess its own digital joint fires system that is operationally ready at all times and capable of deployment in both combat and aid to civil power situations. A baseline scenario demonstrating a brigade group offensive operation will be made available upon request as Appendix 1.

1.4.    Organization

1.4.1.    The CA is the element responsible for conducting land-based operations to accomplish mission objectives. In a concerted effort to achieve missions across the spectrum of conflict, the CA trains and fights at the brigade group level and is responsible to coordinate activities focused on supporting the mission. The brigade group consists of approximately 4,800 soldiers, organized in eight major units generally including Artillery, Armour, Infantry, Engineer, and Combat Service Support organizations. These units operate together in "battle groups" to provide the joint force with the requisite firepower, mobility, protection, sustainment, and C2 functions to effectively coordinate their employment.

1.4.2.    The CA almost always operates with other elements (i.e. Navy, Air Force), in joint operations or with allies and coalition partners (NATO, ABCANZ, etc.), all of whom bring multiple assets, such as fighter aircraft, Remotely Piloted Aerial Systems (RPAS), and ships, each of which produce effects that can influence the land battle. The planning and synchronization of these assets constitute the core of the joint fires concept. Modern land operations require intense coordination with all of these elements, allies, and partners to ensure mission success.

1.4.3.   Joint Fires Enablers are employed at every single level of combined land operations as either commanders, planners, advisors, or operators from the Brigade Group, Battle Group, and down to Combat Team/Company levels. Their primary tasks involve the planning, coordination, and synchronization of joint fires and effects in support of their supported organization. Based on current CA structures, the following types and quantities of Joint Fires Enablers exist in a brigade group.

1.4.3.1.   Brigade Group.

- 1x Brigade FSCC;
- 1x Artillery Commanding Officer Tactical Command Post (CO TAC); *Requires LAV-6 OPV[2] based FOO/JTAC/FSCC capabilities
- 4x Artillery Tactical Groups (ATG); *1x ATG per Battle Group
- 1x Airspace Coordination Centre (ASCC); and
- 1x Brigade Tactical Air Control Party (TACP).

1.4.3.2.   Battle Group Level. *3x Battle Groups per Brigade Group.

- 1x Artillery Tactical Group comprised of:
  · 1x Battery Commander Tactical Command Post (BC TAC); *Requires LAV-6 OPV based FOO/JTAC/FSCC capabilities
  · 1x Battle Group FSCC;
  · 4x FOO; and
  · 4x JTAC.

1.4.3.3.   Company Level. *4x Companies per Battle Group.

- 1x FOO; and
- 1x JTAC.

1.4.3.4.   Total Joint Fires Enablers within a CA brigade group.

- 1x ASCC;
- 1x TACP;
- 4x FSCC (1x Brigade, 3x Battle Group);
- 1x CO TAC;
- 3x BC TAC;
- 17x FOO; and
- 17x JTAC.

1.5.   Project Scope

1.5.1.   The scope for the JFM project covers the hardware, software, and specialty equipment necessary to implement a digital joint fires solution. The JFM project scope will include the following system components:

a)   C2 system(s) to enable the joint fires decision action cycle;

b)   Link the full spectrum of sensors to effectors (both in-service and future systems);

c)   Tactical Specialty Equipment to detect, recognize, identify, and acquire targets;

d)   Networked Training Simulation System; and

e)   Procurement of initial provisioning of two (2) years spare parts and the establishment of In-Service Support Contract(s).

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[2] Light Armoured Vehicle (LAV) Observation Post Vehicle (OPV). This is the artillery/joint fires observer variant of the CA's main fleet of LAV-6 vehicles.

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1.6.    Role and Function

1.6.1.    The JFM project will be focused on improving the decision-action cycle with an integrated joint fires C2 system which connects all locating sensors, effectors, and C2 assets in order to enable the planning, coordination, and synchronization of the full spectrum of fire and effects (lethal and non-lethal via both munition and non-munition means). Critical to the project will be the instantaneous sharing of the Common Operating Picture (COP) including, but not limited to, targets, friendly locations, boundaries, and orders to facilitate all levels (tactical, operational, and strategic) of fires and effects information to be accessed and shared in real-time. Further, the digital network must integrate all Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) assets and link with targeting software, in order to enable decision makers to engage targets in the most effective manner based upon the resources available.

1.6.2.    The cornerstone of a modern, integrated C2 system is a digital network. The introduction of digital data sharing will reduce human error, increase accuracy, minimize the delay in target engagement, and allow for a common and instantaneously updated COP. The achievement of this will guarantee improved force protection, the reduction of collateral damage, and the optimized use of resources to enhance the delivery of fires and effects in support of operational missions.

1.6.3.    The implementation of digital standards and memorandums of agreement adopted by allies will improve our interoperability with coalition partners. These systems will provide a vital contribution to the force protection and precision lethality of formed units conducting joint and combined operations, while reducing the risk to our own forces and increasing chances of mission success by maximizing the effectiveness of every Joint Fires Enabler on the battlefield.

1.7.    Threat Analysis

1.7.1.    The success of all operations, particularly in high intensity conflicts, is based on the soldier's ability to observe, orient, decide, and act more quickly than an adversary. This is especially critical in the application of joint fires, as the combined sum of the vast capability potentially accessible by the Joint Fires Enabler can significantly influence the success of land operations. The ability to leverage the proliferation of the full spectrum of current and future battlefield sensors and effectors makes this a vital capability in current and future conflict.

1.7.2.    Based on the SSE policy review, the guidance on the threat environment that JFM needs to be able to operate in is very broad. The entire operational spectrum of conflict from peace through war must be covered, including potential threats such as terrorism and conventional state actors. The JFM capability will be required to address and operate within the following types of conflicts and threats:

    a)    Future adversaries may be nation states or, alternatively, terrorist and criminal groups and other non-state actors;

    b)    Future operations may be in far distant theatres or in closer regions to Canada including but not limited to urban, arctic, forest, jungle or desert terrain;

    c)    The CAF must be developed as a balanced force able to shape the environment and/or answer combat challenges that are considered credible priorities;

    d)    The CAF must be able to conduct joint fires independently or within an allied coalition. The CAF must be able to lead coalitions and also to play useful roles under US or other coalition leadership;

    e)    The CAF must be a force that excels in joint, interagency, and coalition operations;

    f)    Joint fires must be tailorable to achieve specific effects across the spectrum, including political effects;

g) Joint fires must be able to deliver exceptional accuracy strikes, with munition or non-munition effects to specific targets, with minimal collateral damage and within an appropriate timeframe; and

h) Joint fires time-sensitive targets (TST) demand immediate attention either because they pose a danger to friendly forces or because they represent a high-value, but fleeting target of opportunity.

1.8.    Concept of Operations

1.8.1.    The concept for JFM can be divided into three discrete elements (Figure 1), which then drive the scope of deliverables (Figure 2). The first is how the system will operate as a whole, from the perspective of a joint operational level primarily focused on command, control and interconnectivity through software, while stressing the importance of overall integration and interoperability of all joint fires contributing assets (both coalition and CAF). The second element is how tactical level Joint Fires Enablers will utilize various equipment (target acquisition systems in addition to the interfaces to C2 systems) to coordinate the actual delivery of effects on the battlefield. The final element comprises the synthetic training environment that will enable the CA to force generate, train, and prepare Joint Fires Enablers, planners, and commanders to be ready to deploy on joint operations with coalition partners.



Figure 1. JFM Project deliverables (within red circle) linking Sensor (left) to effector (right) divided into three categories (C2 & Targeting Software, Tactical Equipment, and Training Systems).

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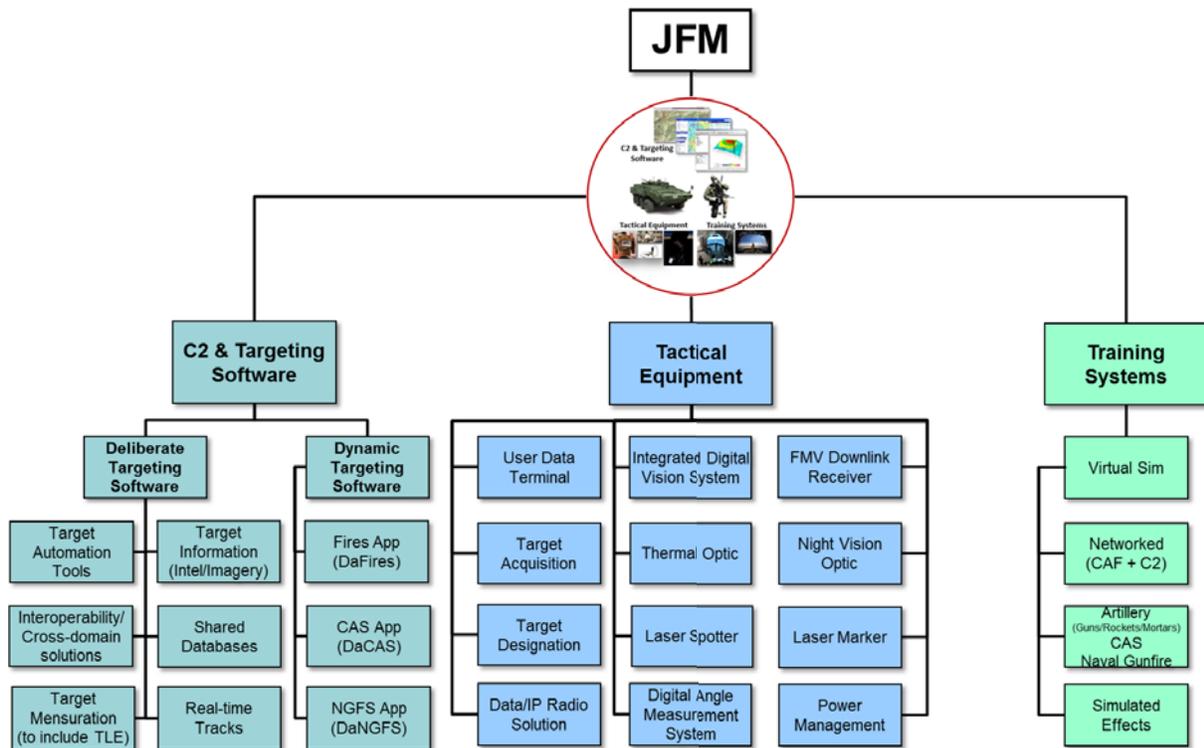
Figure 2. JFM's three categories broken down into sub-system level capabilities. *This is only an initial subset of required capabilities, not limited to those listed.

### 1.8.2    Command and Control

1.8.2.1  Joint fires are defined as *"fires applied during the employment of forces from two or more components, in coordinated action toward a common objective."* From the perspective at the joint operational level, it is critical that assets such as artillery, maritime, and air assets are planned, synchronized, and controlled to achieve the desired effects on the ground within mission guidelines and aligned to National Strategic aims. Joint fires are a critical supporting element to Joint Targeting, not only for the application of precision strike capabilities, but also to integrate non-munition effects. Focusing on the decision-action cycle, the future CAF Targeting Enterprise aims to integrate, synchronize, and automate a range of planned and desired effects across the physical, human, and cyber domains. The joint fires capability in this modern context comprises the tactical application of lethal precision fires and the non-munitions effects supporting the C2 of strategic or joint operational level planning in alignment with the CAF's C4ISR Strategic Vision, Goals, and Objectives.

1.8.2.2  Centralized C2 is essential to the conduct of any military operation. With respect to joint fires, this is especially true. From the strategic level down to the operational and tactical levels, there needs to be a seamless way to properly communicate, plan, and coordinate between different operational elements in the delivery of effects in support of deliberate and dynamic operations. Currently there are gaps at all levels within the CA, as this information cannot be transmitted or shared digitally. At higher levels, the primary limitation is a lack of C2 software applications, as well as automated targeting applications.

1.8.2.3  Interoperability and integration are an essential requirement in operating with other elements and coalition partners. Currently the CA's ability to operate is limited to reliance upon analog voice communication and manual-entry plotting and tracking methods. This is inadequate as technological trends in recent years within NATO have been moving towards high-speed digitally-enabled data communication with common messaging formats. In recognition of these new requirements, the JFM capability will vastly enhance the CA's ability to function in a joint context and with allies. For example, Canada is a signatory to the JTAC

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Memorandum of Agreement (MOA)[3] and is obligated to remain compliant with other nations and continue to overcome interoperability challenges in order to access the air power of fellow signatory nations. The implementation of messaging format standards such as Variable Messaging Format (VMF) 2124, Artillery Systems Cooperation Activities version 7.1 (ASCA 7.1), and ABCANZ Digital Fires Standards are all examples of initiatives that are driving Allied interoperability that JFM will be required to leverage.

### 1.9.    Coordination of Effects

1.9.1    There are sound operational reasons for adopting these improved standards and technology. The high-speed transmission of digital information will improve accuracy, reduce errors, and allow for the more efficient and effective delivery of fires and effects on the battlefield. It will minimize fratricide and collateral damage by facilitating increased situational awareness at all levels. JFM will improve the ability of higher headquarters to communicate and command lower level units, and the ability to operate in a joint context with other elements and coalition partners.

1.9.2    JFM will allow for more effective planning, coordination and command within the CA's brigade and battle groups which provide the core for meeting defence policy mandates outlined in the SSE. At the brigade level, a digitally enabled joint fires solution will streamline the ability to communicate, plan and coordinate between the FSCC, ASCC, and Surveillance and Target Acquisition Coordination Centre (STACC). The end result will be decision-action superiority which will improve the ability to share information at every level from the strategic through to operational and tactical levels. With this achieved, the connectivity, command, and control from sensor to shooter will be obtained.

### 1.10    Training

1.10.1    The final component of the concept of employment are the training systems. JFM will allow land force elements to plan and execute CAF-wide[4] realistic and immersive virtual simulation. The systems will aim to leverage existing and future operational and training networks to establish interoperable systems that permit soldiers to train at home just as they would fight in operations. A suite of training systems will either replicate or integrate the specialty equipment used by Joint Fires Enablers to direct fires in the tactical battlefield. These devices will be networked into the C2 systems in order to train the planning, coordination, and synchronization of joint fires activities. Various other sensors and effectors that support joint fires will either be incorporated while training or simulated as entities in order to replicate the complexities of coordinating multiple sensor systems. Similarly, those assets which deliver fires and effects will be simulated to increase the realism and benefit of training.

1.10.2    JFM training systems will adhere to MOAs and international agreements that validate the substitution of simulated training in lieu of live-fire operational training. The ability to substitute virtual simulation for live-fire provides a significant cost savings, particularly for air-land integration activities, and also permits more frequent and less time-consuming training. All Regular and Primary Reserve units will have training systems regardless of infrastructure constraints (e.g. classroom or hangar space availability) and will be able to network simulators in order to conduct training from multiple and dispersed locations. The end result will see Joint Fires Enablers better trained, ready to exploit rare and expensive live training opportunities, and prepared to deploy into operational environments with confidence and proficiency.

1.10.3    All consolidated elements of the JFM capability will provide:

a)    The ability to achieve Technical Interoperability within the CAF and a Joint Coalition environment;

b)    The ability to achieve Operational Interoperability including to coordinate and employ fires within the CAF and a Joint Coalition context;

c)    The ability to coordinate the delivery of precision guided and conventional munitions;

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[3] JCAS AP MOA 2004-01, Joint Terminal Attack Controller (JTAC) (Ground), Edition-2, 25 Jan 2013

[4] JFM must allow training scenarios involving different amalgamation of stakeholders (e.g. full-scale simulation involving the Royal Canadian Navy (RCN), RCAF and CA or a very small simulation involving one JTAC, a FOO, and a CF-18 aircraft.)

d) The ability to scale the joint fires capability to meet the needs of the operation;

e) The ability to coordinate both lethal and non-lethal effects to conduct joint fires in support of all missions according to the operational environment;

f) The ability to improve situational awareness, enable faster decision making, facilitate more rapid dissemination of a commander's intent and clearance of fires;

g) The ability to provide virtual training regardless of infrastructure constraints at Regular and Reserve Force bases across Canada;

h) The ability to provide realistic and immersive simulation, by using simulated or in-service equipment in customizable mission scenarios; and

i) The ability to achieve Technical Interoperability for Joint Fires simulators in order to conduct training from multiple and dispersed locations.

1.11    Government Furnished Equipment (GFE) / Government Supplied Material (GSM) / Government Furnished Information (GFI)

1.11.1  JFM specific equipment, systems and software will operate on existing CA platforms and infrastructure. Department of National Defence (DND) may identify, as GFE, GSM, or GFI vehicle platforms, networks and C2 systems required for all JFM equipment. As a reference, the CA tactical and HQ networks are TCP/IP based, with MS Windows as OS, and the tactical bearer extensions generally are low-bandwidth, software-defined data radios. Respondents need only consider hardware, software, and integration costs for JFM specific equipment when it comes to merging with GFE.

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**APPENDIX 1 TO ANNEX A – JFM INDUSTRY SCENARIO**

Available upon request as per instructions in section 1.11 of Part 1.

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**ANNEX B - SUSTAINMENT**

Overview

1.1     The Army Structure of Sustainment – Lines of Support

1.1.1    The Army works from a sustainment continuum that stretches from national resources to the individual soldier. Capabilities along the continuum are organized into layers, most commonly referred to as echelons or lines of support. Although the flow is generally linear, one line of support to the next, the system operates on the principle of flexibility that allows, and indeed encourages, the bypassing of lines of support where and when appropriate. The allocation of capabilities within each line conforms to the level of need, the threat as well as the requirement for mobility and protection. The grouping of capabilities into lines of support ensures that each level of command is effectively sustained, but without the burden of holding capabilities better held elsewhere. A line of support may contain a number of sustainment units.

1.2     Lines of Maintenance Support

1.2.1    First Line. A maintenance organization allocated to a unit (i.e. battle group, battalion or regiment). A first line maintenance organization generally performs repairs of limited duration, must have mobility to match the supported unit, and is designed to be the interface with the equipment operators to diagnose faults. 'Limited duration' generally refers to repairs that take four or less hours.

1.2.2    Second Line. A maintenance organization allocated to a formation (i.e. brigade or brigade group). A second line maintenance organization is characterized by its ability to perform maintenance tasks of a longer duration than a first line organization. It generally has access to a greater range of parts and tooling. 'Longer duration' is generally defined as repairs that take between 4 and 12 hours.

1.2.3    Third Line. A maintenance organization allocated to a base or theatre of operations. Third line maintenance augments second line and can provide support to the Materiel Management and Distribution System (MMDS) through component repair and calibration. At third line, repair facilities are more robust and static in nature and repair resources are dedicated to production rather than battlefield survivability. An example is a maintenance workshop at a theatre base on operations, or base level facilities in Canada.

1.2.4    Fourth Line. A national level maintenance organization. Fourth line support is provided from static facilities outside the theatre of operations. It includes national resources such as 202 Workshop Depot, civilian manufacturers, and contractors.

1.3     Types of Maintenance

1.3.1    Preventive Maintenance. Systematic and/or prescribed maintenance intended to reduce the probability of failure. This includes preventative maintenance servicing by both operators and technicians.

1.3.2    Corrective Maintenance. Maintenance actions carried out to restore a defective item to a specified condition.

1.4     Canadian Armed Forces Maintenance Technicians

1.4.1    Canadian Armed Forces Maintenance Technicians who could be involved in the maintenance of the JFM system (in general terms):

        a)      Electronic-Optronic (EO) Technicians: Inspect, test, identify faults in, adjust, repair, recondition and modify electrical, electromechanical, electronic, electro-optic and mechanical equipment, optical instruments, and control systems for weapons and missiles.

        b)      Army Communication and Information Systems Specialist (ACIS) Techs: Perform preventive and corrective maintenance on all types of radios, radar and data processing, cryptographic, terminal, audio and video equipment.

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1.5     Supply Chain

1.5.1     The Canadian Armed Forces (CAF) has two main supply depots in Canada (Edmonton and Montreal) in which materiel from suppliers arrive and are catalogued. From each of these locations, materiel is shipped to CAF bases for distribution to units who are the end user. In terms of spare parts, there is typically a stock level assigned to each location based on the dependent unit's fleet types, fleet size and training frequency, as well as the type of maintenance that can be performed at that specific unit. The stock levels, totaled across all depots and supply locations, are called scaling. A single supply depot is normally assigned for a significant portion of materiel being shipped to international operations.

1.6     Integrated Logistic Support (ILS)

1.6.1     ILS plans and directs the identification and development of logistic support and system requirements for military systems, with the goal of creating systems that last longer and require less support, thereby reducing costs and increasing return on investments. ILS therefore addresses these aspects of supportability not only during acquisition, but also throughout the operational life cycle of the system. The impact of ILS is often measured in terms of metrics such as reliability, availability, maintainability and system safety.

1.7     Sustainment Requirements – ILS Services

1.7.1     Logistic Support Analysis (LSA). LSA is the process by which the logistic support necessary for a new system/equipment is identified. It is comprised of tasks and actions needed to identify and quantify logistic resource requirements, and to optimize the type, quantity, and distribution of these resources with respect to life cycle costs and availability. LSA will include data associated to preventative and corrective maintenance tasks. Additionally, the resources required to complete the maintenance tasks will be identified. These resources include spare parts, consumables, Special Tooling and Test Equipment (STTE), and personnel.

1.7.2     The support analysis data are required to be structured as a Logistic Support Analysis Record (LSAR). The LSAR Database normally includes the following items:

a)     All components (including repairable parts and consumables);

b)     Manufacturer information, total Line Replaceable Units (LRU)/Spares and Unit Costs Estimate;

c)     Recommended Spares/Parts. The recommended Spares/Parts will be used to create the Recommended Spares Parts List (RSPL); and

d)     Indicate if item is a Maintenance Significant Item (MSI).

1.7.3     The Logistic Support Analysis Data listed below are populated in the LSAR if identified as a Maintenance Significant Item:

a)     Failure Rate;

b)     Mean Time to Repair (Hours);

c)     Shelf Life (months);

d)     Maintenance Concept; and

e)     Preventative Maintenance Frequency.

1.8     Initial Provisioning, Spare Parts and STTE

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1.8.1    Industry will be asked to recommend an initial scaling of spare components and sub-systems, in sufficient quantities to support the determined availability of the fleet. The scaling of spare components and sub-systems will reflect the data within the LSA. The JFM project is responsible for acquiring the initial spare parts and two (2) years of annual replenishment spares in addition to the test equipment and consumables, which must be sufficient to sustain the CAF during the initial provisioning period of 2 years, based on the scaling agreed upon between the Project Management Office (PMO) and contractor.

1.8.2    Spare Parts – The initial provisioning period will allow data to be recorded in terms of performance metrics and spare parts usage. This data will be used to properly formulate the basis of the sustainment requirements for the remaining life of the fleet.

1.8.3    Spare Parts Management – The JFM Project is investigating the capabilities of Industry to perform spare parts management, such as warehousing, maintaining and distribution.

1.8.4    Special Tooling and Test Equipment (STTE) – The Original Equipment Manufacturer (OEM) will be expected to identify and provide all STTE required to service, diagnose and repair the fleet as outlined in the LSA.

1.9    Contracted Maintenance and Training Services

1.9.1    Operator Training. When procuring a new fleet, operator training is typically coordinated up front as part of the initial procurement. This allows the CAF to operate the fleets upon initial delivery. Initial Cadre Training is provided by the contractor to a specific quantity of operators and operator-trainers. Ongoing training on operation of JFM will be provided at the Royal Canadian Artillery School located at Canadian Forces Base (CFB) Gagetown. Ongoing training may also be delivered as part of a long-term support contract if required. The JFM Project is investigating the capabilities of Industry to provide ongoing operator training as part of a long-term support contract if required.

1.9.2    Technician Training. When procuring a new fleet, technician training is also typically coordinated up front as part of the initial procurement. This allows the CAF to maintain the fleets upon initial delivery. Initial Cadre Training is provided by the contractor to a specific quantity of maintainers and maintainer-trainers. Ongoing training on maintenance will be provided by the Royal Canadian Electrical and Mechanical Engineers School and the Canadian Forces School of Communications and Electronics. The JFM Project is investigating the capabilities of Industry to provide ongoing technician training as part of a long-term support contract if required.

1.10    Field Service Representative (FSR)

1.10.1    FSRs are individual technician representatives of a supplier to provide maintenance or training services at a site chosen by the CAF. Depending on the fleet, FSR services may be requested at a variety of CAF locations, potentially world-wide or in theatre of operations.

1.10.1.1    Maintain. FSRs could be employed to carry out maintenance tasks and technical investigations in order to sustain the fleet at the predetermined availability.

1.10.1.2    Train. FSRs could be employed across Canada at the major base hubs to train a predetermined number of operators and/or technicians.

1.10.1.3    Repair and Overhaul. FSRs could be employed across Canada at the major base hubs to undertake or assist in repair and overhaul activities.

1.11    Service Facilities

1.11.1    Similar to FSRs, support could be provided at contractor facilities. The JFM Project is also seeking information from Industry on the capabilities to complete repairs, training, and Repair and Overhaul (R&O) in commercial service facilities both within Canada and internationally.

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1.12    Excluded Maintenance Services.

1.12.1    Operational requirements dictate that 1st and 2nd line support in expeditionary operations be provided by CAF technicians. Any contracted support in these instances would be from a 3rd line role, providing support from a theatre base of operations. Tasks of such a contractor arrangement could include support to 1st and 2nd line organizations when operational tempo and geography allow.

1.13    Engineering Services

1.13.1    The JFM Project is exploring the capabilities of Industry to carry out engineering and technical tasks, which are critical to continuously ensuring availability of the system.

1.13.2    Engineering Services. Work may include modifications, system/sub-system/component reliability assessments or failure analysis. Mechanisms for such tasks might include: Technical Investigation and Engineering Support (TIES) contract; Special Investigations and Technical Studies (SITS) contract; Additional Work Request (AWR); or In-Service Support (ISS) contracts.

1.14    Embedded Contractors

1.14.1    The JFM project is investigating the ability of Industry to work embedded in DND facilities in order to enhance communication and provide responsive technical solutions.

1.15    Technical Data Package

1.15.1    Communication. Access to Technical Publications and OEM updates/modifications is critical for the effective management of any fleet.

1.15.2    Provision of Technical Publications. There will be a requirement to provide OEM technical publications such as operator manuals, preventative & corrective maintenance manuals, and available commercial part numbering listings (as procured by OEM).

1.15.3    The JFM Project is investigating the capabilities of Industry to provide updates to technical publications over the 15-year life-cycle of the system.

1.15.4    The JFM Project is investigating the capabilities of Industry to provide Technical Drawing Packages.

1.16    Configuration / Obsolescence Management

1.16.1    There will be a requirement to conduct Configuration Management (CM) to establish and maintain consistency of the performance, functional, and construction attributes of the deliverables with the requirements, design, and operational information.

1.16.2    The JFM Project is investigating the capabilities of Industry to provide Configuration Management services over the 15-year life-cycle of the system.

1.16.3    There will be a requirement to conduct first article inspection and pre-delivery inspections.

1.16.4    There may be a requirement to conduct functional configuration audits and physical configuration audits.

1.16.5    Obsolescence Management. There will be a requirement to provide obsolescence management during the initial provisioning period, which is expected to include but is not limited to high risk components/sub-systems list and obsolescence management issues reports (as required). The JFM Project is investigating the capabilities of Industry to provide obsolescence management services, to ensure that the effects of obsolescence in terms of equipment support, effectiveness and support costs are mitigated by a combination of reactive and proactive management activities.

1.16.6   Hardware Pre-Determined Hardware Upgrades. It is anticipated that it will not be cost effective to maintain a portion of the hardware for the 15-year lifecycle based on low maintainability and changing hardware requirements for the software solutions. The JFM project is investigating the capabilities of Industry to provide hardware upgrades at pre-determined intervals for non-maintainable equipment.

1.17      Software

1.17.1   The system will have a software requirement that in itself will be complex due to integration and will require some or all of the aforementioned ILS services throughout its lifecycle. The software for the system must be given due consideration with respect to configuration management, incremental improvements, and obsolesce management such that it is able to keep pace with current technology and user expectations.

1.17.2   Private Cloud-Based Services. While it may not be feasible to have tactical equipment always connected to a private cloud-based services, the JFM team is investigating the ability for Industry to provide secure updates for software systems when security concerns permit (e.g. at home within Canada).

1.17.3   Software-as-a-Service (SaaS) Subscription Based Payment Model. It may be desirable for Canada to enter a long-term subscription-based payment model for JFM software to avoid obsolesce issues and to maintain always an up to date software baseline. Canada is investigating the ability of Industry to provide JFM software, including updates, at a fixed firm cost over the lifecycle.

1.17.4   Network Architecture. It is anticipated JFM will require access to networked data. The JFM team is investigating the most appropriate network architecture, technical interface, redundancy, and data storage method to reach the desired system availability and uptime.

1.18      Testing

1.18.1   There will be a requirement to prove defined JFM capabilities in a test setting. This may include, but is not limited to:

1.18.1.1   DND User Trials - Test & Evaluation to demonstrate that the system meets the requirements and specifications; and

1.18.1.2   Contractor Capability Testing – Testing could include but is not limited to: start-up, operate, conduct various tasks, extreme weather operations.

1.19      Intellectual Property

1.19.1   Canada must have sufficient Intellectual Property (IP) access to ensure it is able to sustain the fleet throughout its life. Canada intends to use standard acquisition clause and condition (SACC) 4006 – 'Contractor to Own Intellectual Property Rights in Foreground Information' to achieve this aim. Similarly, SACC 4003 – 'Licensed Software' will be used for the software.

1.20      Preliminary Concept of Sustainment

1.20.1   Maintenance

1.20.1.1   First line performed in expeditionary operations by CAF technicians. Domestically, CAF technicians may be supported by FSRs. Third and fourth line maintenance is anticipated to be conducted by contractor/FSR both domestically and on operations.

1.20.1.2   An initial period of maintenance support to be provided by the contractor, with an additional support contract to be considered separately over the lifecycle of the JFM system. Maintenance of any simulation system is anticipated to be provided by the contractor should it have unique maintenance requirements from the JFM system.

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1.21    Supply

1.21.1    The JFM project will acquire two years spares and technical stores to the appropriate CAF depot(s). The depot(s) will hold an additional operational stock of at least 30 days of supply of parts, but options for contractor housing of spares and technical stores delivery will be explored.

1.22    ILS Services

1.22.1    It is expected that configuration management, engineering support, technical data packages, and operator and maintenance manuals will be part of a long-term service contract. Access to data for logistic support analysis will be essential, as will the integration of fleet data with the CAF's SAP enterprise resource planning tool, Defence Resource Management Information System (DRMIS).

1.23    Lifecycle and R&O

1.23.1    The estimated life expectancy of the equipment is currently anticipated at 15 years. To achieve a lifecycle of 15 years it is expected that non-maintainable hardware be replaced on a 5-year interval.

1.24    Software

1.24.1    The preferred software support system will be a subscription model services that ensures improvements and continued integration with CAF and allied systems over its lifecycle.

1.25    Training

1.25.1    Initial cadre training for both operators and maintenance personnel to be developed and delivered by contractor, with training materials transferred to the CAF to be adapted for our own use. The number of serials will depend on the length and complexity of the training package, but the end state will be achieved when training responsibilities are transferred successfully to Army and/or long-term arrangements are made for contracted training (if needed). Simulators are expected to be part of the training solution for operators and there may be a requirement for at least one maintenance training aid for Canadian Forces School of Communication and Electronics.

1.26    Key Performance Indicators (KPIs) by which sustainment may be measured

1.26.1    Of prime concern is the availability of the JFM system to perform its mission. The following are a few common metrics that we are considering to measure the sustainment system performance. While the metrics below emphasize mean values, other measures of central tendency may be examined (i.e. median, mode) if appropriate.

1.26.1.1    Mean time to repair (MTTR). The mean time to conduct a corrective maintenance action by technicians.

1.26.1.2    Mean operating time between failures (MTBF). For a stated period in the life of a functional unit, the mean value of the lengths of operating time between consecutive failures under stated conditions.

1.26.1.3    Mean downtime (MDT). Downtime consists of all preventive and corrective servicing and repair time plus time awaiting parts or labour and other administrative delays.

1.26.1.4    Uptime. Represents the time the equipment is operated and available for use.

1.26.1.5    Mean time to deliver spare parts (MTTDSP). Mean time from when order placed in DRMIS to delivery of part to appropriate maintenance organization.

1.26.1.6    Mean time between maintenance (MTBM). For a stated period in the life of a functional unit, the mean length of operating time between maintenance. MTBF only considers preventative and

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corrective maintenance performed by technicians, not that which is considered operator maintenance.

1.26.1.7   Availability. The probability an item is in operable and committable state at the start of a mission when the mission is called for at an unknown (random) time. We will quantify availability in three ways:

1.26.1.7.1   Inherent availability: $= \dfrac{MTBF}{MTBF + MTTR}$

This expression of availability is a characteristic of the equipment being maintained and does not reflect on the maintenance environment.

1.26.1.7.2   Achieved availability: $= \dfrac{MTBM}{MTBM + MDT}$

This measure reflects the reliability and maintainability of the equipment as it only includes preventive and corrective maintenance activities.

1.26.1.7.3   Operational availability: $= \dfrac{Downtime}{Downtime + Uptime}$

Operational availability reflects on the maintenance environment as well as the equipment. This is the measure of availability which gives the true availability of the system for operators.

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## PART 3 – QUESTIONS AND RESPONSE TEMPLATES

Respondents should use the following annexes as templates for their response submission.

Annex C - Industrial Technological Benefits / Value Proposition
Annex D - Costing requirements / Questions
Annex E - JFM High Level Mandatory Requirements and Questions
Annex F - JFM Sustainment Questions

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**ANNEX C – INDUSTRIAL TECHNOLOGICAL BENEFITS / VALUE PROPOSITION**

1.      Industrial and Technological Benefits (ITB) Policy

1.1.     Application of the Industrial and Technological Benefits (ITB) Policy

1.1.1.    The Industrial and Technological Benefits (ITB) Policy may be applied on the Joint Fires Modernization (JFM) project. Engagement with Industry through the Request for Information (RFI) will help determine the application of the ITB Policy and how Canada could leverage opportunities for economic benefit through this procurement.

1.2.     The ITB Policy including Value Proposition

1.2.1.    The ITB Policy is a powerful investment attraction tool and companies awarded defence procurement contracts are required to undertake business activities in Canada equal to the value of the contract. The ITB Policy encourages companies to establish or grow their presence in Canada, strengthen Canada's supply chains, and develop Canadian industrial capabilities.

1.2.2.    The goal of the ITB Policy is to support the long-term sustainability and growth of Canada's defence sector, including small and medium-sized enterprises in all regions of the country, to enhance innovation through R&D in Canada, to support skills development and training, and to increase the export potential of Canadian-based firms. The ITB Policy includes the Value Proposition (VP), which requires bidders to compete on the basis of the economic benefits to Canada associated with its bid. Winning bidders are selected on the basis of price, technical merit and their VP. VP commitments made by the winning bidder become contractual obligations in the ensuing contract.

1.2.3.    For more information about the ITB Policy, please visit www.canada.ca/itb.

1.3.     Key Industrial Capabilities:

1.3.1.    To maximize the economic impact that can be leveraged through the VP, Canada will look to use the ITB Policy to motivate defence contractors to invest in Key Industrial Capabilities (KICs). KICs align with Canada's defence policy, *Strong, Secure, Engaged*, and the *Innovation and Skills Plan* by supporting the development of skills and fostering innovation in Canada's defence sector. The KICs represent areas of emerging technology with the potential for rapid growth and significant opportunities, established capabilities where Canada is globally competitive, and areas where domestic capacity is essential to national security.

1.3.2.    Based on initial analysis of the JFM project, this procurement encompasses the KICs of Cyber Resilience and Defence Systems Integration where Canada has world leading capabilities. Canada will be seeking to motivate high value economic opportunities and partnerships to support the growth of Canada's defence sector, as well as enhance supply chain participation and skills development opportunities for Canadian industry.

1.4.     The definitions for the relevant KICs for this project are:

a)      *Cyber Resilience*

Cyber resilience spans every element of the domestic commercial, civil and national security sectors and addresses the vulnerabilities created by the expansion of information technology and the knowledge economy.  Activities in this segment include design, integration and implementation of solutions that secure information and communications networks. These and other technologies should focus on achieving effective development of the following cyber capabilities:

i.      *Information security*

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The practice of defending electronic and digital data and information from unauthorized access/intrusion, use, disclosure, disruption, modification, perusal, inspection, recording or destruction;

### ii. IT security

Secure content and threat management (endpoint, messaging, network, web, cloud), security, vulnerability and risk management, identity and access management and other products (e.g. encryption/tokenization toolkits and security product verification testing), and education, training services and situational awareness; and

### iii. Operational technology (OT) security

Monitoring, measuring and protecting industrial automation, industrial process control and related systems. Cyber resilience may involve the development of tools and the integration of systems and processes that permit hardening of tactical systems or broader networks, encryption, cyber forensics, incident response, and others. Capabilities developed in this domain may increasingly draw on AI as an enabling technology; for example, networks may autonomously and dynamically defend against intrusions and repair themselves if disrupted.

### b) Defence Systems Integration

Design and integration of complex military systems that hinge on the seamless linking together of multiple sub-systems to yield an effective operational capability. These capabilities span various military platforms and enable the operation and management of weapons, defensive systems, command and control systems, sensors, decision support systems, electronic warfare devices and a platform's core sub-systems in a tightly coordinated fashion essential under highly stressing combat conditions. These systems need to present information to their operators stemming from multiple sources in a manner that is understandable, secure, and supports decision-making in a complex environment. This definition does not include the various constituent systems (e.g., missile launching systems, radars, electronic warfare systems, etc.) that the work of defence systems integration aims to combine into a cohesive whole. Rather, the definition focuses on the skills and other capabilities needed to perform the integration work, and to create the user interface that is needed in such complex mission systems.

2. JFM ITB/VP Industry Engagement Questions:

2.1. Defence Sector:

The ITB Policy seeks to promote economic development and long-term sustainment of Canadian businesses engaged in the manufacturing and delivery of products and services used in government defence and security applications.

2.1.1. Based on the technical requirements put forward by the Department of National Defence, describe what work activities your company would foresee undertaking in Canada for the production and the maintenance of the JFM system? As part of your response, please highlight work activities your company would foresee performing in Canada in the KICs of Cyber Resilience and Defence Systems Integration.

2.2. Supplier Development:

The ITB Policy seeks to improve the competitiveness of Canadian industry by encouraging Canadian industrial participation and the scaling up of Canadian companies including small and medium-sized businesses (SMB) in the supply chains of bidders and tier-one suppliers for the JFM project.

2.2.1. In what areas of production and service-provision does your company currently work with Canadian SMBs, and how are these SMBs involved?

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2.2.2    Is there potential to involve Canadian SMBs in the area of production and/or service provision of the JFM project?

2.2.3    To what extent do these SMB work opportunities align with the KICs of Cyber Resilience and Defence Systems Integration? As part of your response, please specify if these opportunities are directly or indirectly related to work activities on the JFM project?

2.3      Skills Development and Training:

The ITB Policy fosters the development and sustainment of a diverse, talented, and innovative Canadian workforce through access to training, education, opportunities and programs.

Examples of Skills Development and Training activities:

a)   Work integrated learning programs (e.g., co-operative education; work placements);
b)   Apprenticeship programs;
c)   A new or existing skills development program at or through a post-secondary institution; and
d)   Support for security certifications (e.g.: Top Secret, ITAR) or cybersecurity compliance certifications for Canadian companies, especially small and medium-sized businesses;

2.3.1    What Skills Development and Training activities does your company currently provide, and could these activities be extended to Canadians working directly or indirectly on the delivery of the JFM project?

2.3.2    What Skills Development and Training challenges does your company anticipate within the KICs of Cyber Resilience and Defence Systems Integration and how is your company seeking to overcome them?

2.4      Research and Development (R&D):

The ITB Policy promotes scientific investigation that explores the development of new goods and services, new inputs into production, new methods of producing goods and services, or new ways of operating and managing organizations.

2.4.1    Please describe your company's priority areas for R&D investment and how they relate to the JFM project?  As part of your answer, please identify to what extent these priority areas align with the Cyber Resilience and Defence Systems Integration KICs of Cyber Resilience and Defence Systems Integration?

2.4.2    Recognizing the role that post-secondary institutions and public research institutes play in fostering innovation in Canada, please describe what potential direct or indirect opportunities your company foresees undertaking in Canada with these organizations and what specific research areas you would pursue.

2.5      Export:

The ITB Policy promotes the ability of Canadian companies, including SMBs, to successfully tap into export markets, thereby increasing their productivity, and competitiveness in the global market.

2.5.1    What role does the JFM procurement play in positioning your company and its Canadian supply-chain for long-term growth?

2.5.2    To what extent can you integrate Canadian companies into your international supply chain?

2.5.3    To what extent do opportunities exist in the KICs of Cyber Resilience and Defence Systems Integration?

2.5.4    Which JFM subsystems are potentially the most exportable and why?

2.5.5    Is it feasible to secure sufficient intellectual property rights and an exclusive global product mandate to export from your Canadian-based operations, including subsidiaries and supply chain partners?

2.5.6    Please describe any challenges or constraints the company faces in sharing Intellectual Property (IP) with Canadian partners and suppliers?

2.6  Other questions:

2.6.1    Are there other relevant KICs which align with the work to be conducted for the JFM project?  If yes, please indicate which KICs should be considered and why.  As part of your response, please describe how the proposed KICs would enhance the opportunities that could be leveraged through the Value Proposition for Canadian industry.

2.6.2    With consideration to technical merit and price, the Value Proposition typically has a weight of no less than 10 percent of the overall bid evaluation.  Please submit your views on the weighting of the Value proposition for the JFM project.  In your response, please include feedback on proposed weightings for each Value Proposition pillar (i.e. Defence Sector, Supplier Development, Skills Development and Training, Research and Development, and Exports).

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## ANNEX D – COSTING REQUIREMENTS/QUESTIONS

Initial Acquisition

1.      The purpose of the Joint Fires Modernization (JFM) costing annex is to request indicative costing information from suppliers in order to allow Canada to prepare its documents for the Project Approval. Respondents are asked to provide Indicative or Rough Order of Magnitude (ROM) pricing for as many questions and activities as possible in this annex. If a specific cost element is not provided for any reason (e.g. it is included in the price for another item), please provide an explanation in your response.

2.      Please provide a breakdown, to the lowest level possible, of the cost of the JFM solution your firm suggests that would enable Canada to meet all of the requirements laid out in Annexes A and B.

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Table 1 - Acquisition Costs

| Description | Proposed Solution | Quantities | Firm unit price 0 = No Cost |
|---|---|---|---|
| **C2 & Targeting Software** - Software and systems that will enable the digitalization of fires in a joint, coalition environment. Will enable the deliberate and dynamic targeting cycles by maximizing situational awareness, efficiency, and accuracy of engagements through the use of tools to facilitate the analysis, planning, coordination, and delivery of all fires and effects in support of land operations. (Reference Annex A) | | | |
| a) C2 & Targeting Software | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| *If possible, please include average operating costs - Hourly, Annually...etc. Please provide a detailed response. | | | |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| **Tactical Equipment** - Equipment and systems that will enable Joint Fires Enablers with the capability to detect, identify, acquire, and coordinate the engagement of targets at the tactical level. These must be scalable, modular, and task-tailored to meet the full spectrum of Canadian Army (CA) core missions. (Reference Annex A) | | | |
| b) Tactical Equipment | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| *If possible, please include average operating costs - Hourly, Annually...etc. Please provide a detailed response. | | | |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |
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**Training Systems** - An accredited joint fires simulated environment that will provide a training solution scalable from the strategic to the tactical levels and networked across geographically dispersed training locations. The training and simulation solution will allow for individual and collective training that is realistic and immersive, while integrating in-service equipment and systems, or similes, within customizable mission scenarios. (Reference Annex A)

| c) Training Systems | | | $ _____.__ |
|---|---|---|---|
| | | | $ _____.__ |
| | | | $ _____.__ |
| | | | $ _____.__ |

*If possible, please include average operating costs - Hourly, Annually...etc. Please provide a detailed response.

| | | | $ _____.__ |
|---|---|---|---|
| | | | $ _____.__ |
| | | | $ _____.__ |

Sustainment

1.　　　Project cost for activities related to sustainment of JFM equipment.

2.　　　Notes: Please indicate each deliverable and associated costs if applicable in reference to section 1.

Table 2 – Sustainment Costs

| Description | Firm unit price<br>0 = No Cost |
|---|---|
| Ongoing Annual  Program Management Cost that captures the costs for the following CORE activities: | $ _____.__ |
| **2.1**　　**Sustainment Requirements – ILS Services** | |
| 2.1.1　　Integrated Logistic Support (ILS) Plan | |
| 2.1.2　　Logistic Support Analysis (LSA) | |
| **2.2**　　**Configuration Management (CM)** | |
| 2.2.1　　Conduct Configuration Management | |
| 2.2.2　　Conduct First Article Inspection | |
| 2.2.3　　Conduct  Pre-Delivery Inspection | |
| 2.2.4　　Conduct Functional Configuration Audit | |
| 2.2.5　　Conduct Physical Configuration Audit | |
| 2.2.6　　Provide updates to technical publications over the 15 year life cycle of the JFM System. | |
| **2.3**　　**Obsolescence Management (OM)** | |
| 2.3.1　　High Risk Components / Sub-systems list | |
| 2.3.2　　Obsolescence Management Issues Report (as required) | |
| 2.3.3　　Cost of proposed solution to track KPI performance metrics | |
| **2.4**　　**Initial Provisioning and Supply Services** | |
| 2.4.1　　Initial spare parts and two (2) years of annual replenishment spares | $ _____.__ |
| 2.4.2　　Spare parts management at commercial facilities and delivery both to Canadian facilities and internationally | $ _____.__ |
| 2.4.3　　Warehousing of spare parts at contractor facilities. | $ _____.__ |
| **2.5**　　**Special Tools and Test Equipment (STTE) for the preventive and corrective maintenance the JFM System** | |
| 2.5.1　　STTE requirements / STTE Package | $ _____.__ |
| **2.6**　　**Contracted Maintenance and Training Services** | |
| 2.6.1　　Initial Cadre Training (ICT) – Operator Training (English and French) | $ _____.__ |
| 2.6.2　　Initial Cadre Training (ICT) – Technician Training (English and French) | $ _____.__ |
| 2.6.3　　ICT Courseware (Operator and Technician). (English and French) | $ _____.__ |
| 2.6.4　　Training Aids for Maintenance Training. | $ _____.__ |
| **2.7**　　**Service Facilities** | |
| 2.7.1　　Cost associated with 1st, 2nd, 3rd, and 4th line repairs in commercial service facilities both within Canada and internationally | $ _____.__ |
| 2.7.2　　Cost associated with repair and overhaul at contractor facilities. | $ _____.__ |

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| 2.8 | **Engineering Services** | | |
|---|---|---|---|
| **2.8.1** | **Technical Investigation and Engineering Services (TIES)** | | |
| 2.8.2 | Technician | HOURLY RATE | $ _____.__ |
| 2.8.3 | Engineer | HOURLY RATE | $ _____.__ |
| Provide any other related labor categories along with the costing information | | | |
| | | HOURLY RATE | $ _____.__ |
| | | HOURLY RATE | $ _____.__ |
| | | HOURLY RATE | $ _____.__ |
| **2.9** | **Fielding and Maintenance support** | | |
| 2.9.1 | FSR - Maintain | HOURLY RATE | $ _____.__ |
| 2.9.2 | FSR - Train | HOURLY RATE | $ _____.__ |
| 2.9.3 | FSR - Repair and Overhaul | HOURLY RATE | $ _____.__ |
| **2.10** | **Technical Data Package** | | |
| 2.10.1 | Operator Manual (English and French) | | $ _____.__ |
| 2.10.2 | Preventative & Corrective Maintenance Manuals (English and French) | | $ _____.__ |
| 2.10.3 | Associated costs for Technical Drawing Packages | | $ _____.__ |
| **2.11** | **Software** | | |
| 2.11.1 | Licencing / renewal / subscription | | $ _____.__ |
| 2.11.2 | Integration or ongoing support costs (as required) | | $ _____.__ |
| **2.12** | **Testing** | | |
| 2.12.1 | Support DND-led User Trial | | $ _____.__ |
| 2.12.2 | Contractor-Led Capability Testing | | $ _____.__ |
| 2.12.3 | Support DND-led testing | | $ _____.__ |
| **2.13** | **Intellectual Property (if applicable)** | | |
| 2.13.1 | Licence to IP rights specified (if applicable) | | $ _____.__ |

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| Any other costs that may be relevant to ongoing sustainment of the JFM system as a whole | | |
|---|---|---|
| Item, Description, Etc. | Quantity, Hourly, Etc. | Cost |
| | | $ _____.___ |
| | | $ _____.___ |
| | | $ _____.___ |
| | | $ _____.___ |
| | | $ _____.___ |
| | | $ _____.___ |
| | | $ _____.___ |
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**ANNEX E – JFM HIGH LEVEL MANDATORY REQUIREMENTS AND QUESTIONS**

1.      High Level Mandatory Requirements (HLMR)

1.1     General

1.1.1   This appendix contains the preliminary HLMR for Joint Fires Modernization (JFM) which define a set of high level functional and performance requirements. Respondents are requested to provide information describing how their proposed solution meets each of the HLMR.

1.1.2   Each of the six HLMRs has an opening descriptive followed by the detailed requirements questions.

1.2     Interoperability - Technical

1.2.1   The ability for the joint fires systems to digitally transmit and receive data and information using standardized digital formats between Joint (Canadian Armed Forces (CAF)) and Coalition partners (such as the North Atlantic Treaty Organization (NATO) or the American, British, Canadian, Australian and New Zealand Armies (ABCANZ)).

1.2.2   The ability for the joint fires systems to function in near real-time[5], regardless of security classifications[6] or mission caveats, within the Department of National Defence (DND)/CAF, Government of Canada (GoC) partners, NATO and ABCANZ in all operational environments[7].

   a)    Will the system provide accurate situational awareness in near real-time (specify latency time in seconds) of various fires and effects resources and potential targets?

   b)    Will the system be capable of conducting multiple mission engagements, from the same Command and Control (C2) user interface, simultaneously without degradation in time and accuracy?

   c)    Does the system use common standards for the storage, dissemination, and retrieving of data and information? If so, which?

   d)    What type of Tactical Data Link(s) (TDL) are supported by the system (e.g. Link 11/16/22, 11B, Joint Range Extension Application Protocol (JREAP) A, B and C)? How will the TDL information be shared and integrated into the JFM? Will the exchange of tactical air data be in near-real time among CAF and Allied platforms and sensors?

   e)    What networking protocols and operating system version(s) (e.g. Windows, Android, etc.) are used for your system?

   f)    What types of messaging standards are compatible with your system such as Variable Message Format (VMF), Artillery Systems Cooperation Activities (ASCA), etc.?  What version(s) of these standards is your system compatible with?

   g)    Does the system allow the rapid and accurate transfer of information from the sensors to the effectors across networks with unique security classifications? Does your solution account for Cross Domain Guards required for sensor data, control data or any other data types listed in Para 1.2.2 (d), (e) or (f) if movement from one security classification to another is required?

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[5] Data displayed to the user must be updated with the most recent data available in the network to support shared situational awareness. Delays by automated data processing or network transmission, between the occurrence of an event and the use of the processed data, such as for display or feedback and control purposes shall be minimized.

[6] Examples: (NATO) COSMIC TOP SECRET, NATO SECRET, and NATO CONFIDENTIAL. (CANADIAN) TOP SECRET, SECRET (Mission Rel), SECRET FIVE-EYES (FVEY), CONFIDENTIAL, and UNCLASSIFIED.

[7] Operational environments are defined as the entire spectrum of conflict from peace to war, and throughout the continuum of operations.

h)  Can your system support raw video and/or data from sensors? If so what format and standards are supported?

i)  Is your system capable of data forwarding? Can messages be converted between different messaging standards (and/or versions within a standard) for forwarding?

j)  The communications infrastructure will be Government Furnished Equipment (GFE), respondents need only consider hardware, software and integration costs for JFM specific equipment when it comes to merging with GFE. A list of required interfaces are as follows:

- Consolidated Secret Network Infrastructure (CSNI);
- Modernized Integrated Database (MIDB);
- Land Command Support System (LCSS);
- Indirect Fire Control Software Suite (IFCSS) / Artillery Managed Information System (ArtyMIS);
- M777C1 Digital Gun Management System (DGMS); and
- Light Armoured Vehicle (LAV) 6 Observation Post Vehicle (OPV) with the Global Positioning System (GPS) Anti-Jam Technology (GAJT);

What integration issues should the project be aware of and plan for?

1.3     Interoperability - Operational

1.3.1    The ability for the joint fires systems to integrate operational processes[8] and information shared on the network between Joint (CAF) and Coalition partners[9] (ABCANZ, NATO).

a)  Which other nations have fielded your systems? For how many years have these forces fielded your systems? Are any nation's forces currently fielding your systems?

b)  Will the system provide battle management capability to accurately display situational awareness in near real-time (specify time in seconds) of various fires and effects resources, and potential targets? Can the system receive these inputs from other nations' systems?

c)  How does the system enable command and control decisions to support the requirements in the scenario provided in Appendix 2?[10]

d)  What identified standards (NATO STANAG, MIL-STD, AArtyP, or ADatP) for operational interoperability is the system compliant with?

e)  What other standards or interoperability initiatives, such as the Joint Close Air Support Memorandum of Agreement (JCAS MOA) is the system compliant with?

f)  What coordinate systems can your system support? (e.g. Military Grid Reference System (MGRS), Universal Transverse Mercator (UTM), Universal Polar Stereographic (UPS), etc.)

g)  What military symbology standard(s) and version(s) are supported? (e.g. APP 6, MIL-STD-2525, etc.)

---

[8] Operational processes: Constitutes the Army's view on planning, preparing, executing and assessing operations. Commanders, supported by their staffs, use the operations process to drive the conceptual and detailed planning necessary to understand, visualize, and describe their operational environment; make and articulate decisions and direct, lead and assess military operations. If elements or allies use incompatible operations processes, they will not be interoperable even though the digital information is reaching the intended destination. (B-GJ-005-300 FP-000, CF Operations)

[9] Different elements within the CAF or different nation use different ways or means to conduct operation. Information shared into the network need to be standardize in order to be used and understand by others. (B-GJ-005-300 FP-000 CF Operations)

[10] Available upon request.

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1.4     Effects

1.4.1    The ability for the joint fires systems to centrally coordinate, and select the appropriate effects on the battlefield to engage targets with precision and minimize unwanted effects (collateral damage, fratricide, etc.).[11]

a)      Is your solution capable of facilitating all activities associated with the planning, collection, formulation, processing, and distribution of fire support command and fire control information, including orders and reports?

b)      Does your system provide Target Automation tools and supporting infrastructure for joint targeting workflows?  Do these tools support customization for rules of engagement, varied levels of approvals, etc.?

c)      Does your system support dynamic targeting (the ability to nominate, vet, assign, and plan cross-component and boundary missions)?

d)      Can your system provide an automated display of Collateral Damage Estimate (CDE) distances and/or weapons effects table distances to users?

e)      Does your system support the process of Target Coordinate Mensuration?

f)       Is your solution capable of automatic queuing and/or prioritization of fire missions?  What forms of automating and/or prioritization are supported (such as the Attack Guidance Matrix (AGM), High Payoff Target List (HPTL), Joint Priority Target List (JPTL), etc.)?

g)      Is your system capable of making recommendations for weapon/ammunition/effect to be applied against a target?

h)      Can your solution interface, register, and/or catalogue indirect fire assets that automatically advertise their availability to engage (Engagement/Availability Reporting)?

i)       Does your solution provide a near real-time summary of resource states for effectors, such as ammunition type and quantity remaining, propellant/fuze types and quantity remaining, current engagement range limits, fuel, engagement status, mission assignment, etc. for individual platforms (e.g. Close Air Support (CAS) aircraft sorties or formed units such as a Field Artillery Battery)? Is this status capable of being updated and broadcast to all users of the system? What is the update mechanism?

j)       What is the range of your solution's connectivity? What nodes on the battlefield can be equipped with components of your solution? Can your system support multiple network and radio paths for mesh connectivity? Is this proven operationally?

k)      How will the system provide accurate cueing for sensors or effector platform(s) that provide clear association with tracks produced by other Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) sensors?

l)       How will the system correlate between active and passive sensors? Will the data be fused and how (automatically)? How will this be displayed to the Joint Fires Enabler?

m)     Can your solution provide automated de-confliction of fires and manoeuvre? Track correlation/fusion?

n)      How many targets is the system capable of registering, displaying, logging, and/or tracking?

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[11] Effects includes munition and non-munition effects. This HLMR is strongly linked with the C2 and targeting software allowing commanders to analysis and choose the best assets or combination of assets to achieve an effect on the battlefield.

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o)   How will the tracking of targets by multiple sensors be coordinated and correlated to provide an integrated Common Operating Picture (COP) on both the ground and in the air? Are multiple target location detections capable of being analyzed and consolidated into single point targets for display to the user?

p)   Is your system capable of performing threat evaluation (alerts to users based upon counter battery, counter UAS, counter launch triggers, etc.)?

1.5   Flexibility

1.5.1   The ability for all equipment and software of the JFM project to be scalable[12], modular, and task-tailorable[13] to meet the CA's core missions.

a)   Does the system have an integrated battle management system that is used to coordinate, command and control firing centers, sensors, and effectors?

b)   Can your system communicate over a variety of networks? Please list which (e.g. frequency modulation, very high frequency, ultra-high frequency, Enhanced Position Location Reporting System (EPLRS), local area networks, etc.).

c)   Does the system support target handoff or handover between sensors/observers?

d)   Is your solution scalable up to Brigade and Division level operations?

e)   Is your proposed software system an open or closed architecture?

f)   Is your system scalable to permit interfacing with future sensors and effectors?

g)   Does your system contain the gateway capability to enable the JFM solution to effectively interface? Which gateways have you successfully developed and implemented? (e.g. Link 11/16/22, VMF, USTMF, ASCA, ABCANZ 2124).

h)   In what format(s) is your system capable of sending and receiving calls for fire and other messages (VMF/ASCA/USMTF, etc.)?

i)   Is your system able to prepare, transmit, and coordinate a fire mission from a field artillery unit such as M777 Battery; rocket artillery unit (ex: Multiple Launch Rocket System (MLRS)); operational long-range precision fires (ex: Army Tactical Missile System (ATACMS)); strategic fire assets (ex: Tomahawk Land Attack Missile (TLAM))?

j)   Is your system capable of computing firing solutions for all types of Canadian indirect fire weapons (M777C1, 105LG1, 105C3, and 81mm) and associated ammunition/fuze/propellant combinations such as M1DC, M795, Excalibur; Precision Guidance Kit (PGK), C32A1, M762; M4A2, M231, M232A1, etc.?

k)   How will your system support future Canadian ammunition, fuze, propellant purchases and new combinations?

l)   Is your system capable of planning, transmitting, and coordinating the application of Information Related non-munition capabilities? (e.g. Electronic Warfare (EW), Cyber, Public Affairs, Information Operations, Psychological Operations, etc.)

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[12] JFM must have redundancy in the network gateways allowing the amalgamation of different assets.

[13] Modular and task-tailorable: Refer to the ability to construct an equipment structure of multiple units and dimensions for flexibility and variety of use. The user can then pick and choose the most efficient composition of units or equipment to successfully fulfill a mission.

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m) Is your system able to connect and report to non-lethal effectors such as electronic attack, cyber, etc.?

n) Is your system able to prepare, transmit, and coordinate a digital CAS 9-line mission?

o) Is your system capable of preparing and transmitting a digital Joint Tactical Air Strike Request (JTAR)?

p) Is your system able to prepare, transmit, and coordinate a Close Combat Attack or Gun Ship 5-line call for fire?

q) Is your system capable to prepare, transmit, and coordinate a Naval Gunfire Support call for fire to a Naval Gun Fire Control Net (in accordance with NATO STANAG 1034 and ATP-04F - Allied Naval Gunfire Support)?

r) Is your system able to support Fire Planning (allocation of targets to effectors on a timescale for coordinated engagement)? What is the user interface for the Joint Fires Enabler?

s) Is the user interface of your system scalable to both mounted (in a LAV-6 OPV) and dismounted operations by the Joint Fires Enabler? What are the power and weight requirements?

t) Will the system provide the operator an interface to create, edit, and monitor Fire Support Control Measures (FSCM)?

u) Which control measures are implemented in the system? Can these be imported, produced and transmitted?

Examples within a typical brigade group area of operations, in accordance with FSCM and Airspace Coordinating Measures (ACM) within an Airspace Control Order (ACO):

- Unit boundaries (from Company to Corps level);
- Restricted Fire Lines (RFL); Coordinated Fire Lines (CFL);
- Fire Support Coordination Lines (FSCL);
- No Fire Areas (NFA);
- Restricted Fire Areas (RFA);
- Free-fire Area (FFA);
- Airspace Coordination Area (ACA);
- Restricted Operating Zones (ROZ);
- Hostile Aircraft Free Engagement Zone (HAFEZ);
- Standard Use Army Aircraft Flight Route (SAAFR);
- Weapons engagement zones;
- Air control point;
- Airspace-restricted areas;
- Coordination level/altitude;
- Weapons free zones;
- Communications checkpoint;
- Initial point;
- Waypoint;
- Base Defense Zone (BDZ)
- Etc.

Please specify which of the above control measures (or others) your system supports?

v) Can the system create, store, and check FSCMs/ACMs for violations during fire mission processing? Are FSCMs/ACMs used during unit assignment to fire missions? Does fire mission processing attempt to automatically find firing solutions to avoid FSCMs/ACMs? Is terrain data such as Digital Terrain Elevation Data (DTED), etc. also used during fire mission processing?

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w)   What Meteorological standards they support for fire mission processing (e.g. STANAG 6022 meteorological messages such as Standard Gridded Data Meteorological Message (METGM), Standard Computer Meteorological Message (METCM), and Standard Target Acquisition Meteorological Message (METTA) etc.)?

x)   Does your system provide the ability to change and display operational and tactical maneuver graphics? FSCMs? ACMs on the air tasking order, air tracks on the Air Tasking Order (ATO)?

y)   Is the system capable of plotting, sharing, pairing, and/or tracking engagement and re-engagement of multiple ground targets?

z)   How many targets can your system simultaneously register and log? Does it support target list management?

aa)   Can your system log and display all sensors and effectors connected to the network and their status (ex: available/engaged (Artillery, rockets); on-station/ammunition expended/Return to Base (CAS); radiating/down for maintenance (radars); flying/on the ground (Remotely Piloted Aerial Systems (RPAS))); etc.?

bb)   Is the system capable of amalgamating multiple detections of the same target to provide a single point location to the user? Is this in real-time or does it induce latency?

cc)   Does the system correlate or make recommendation of effector to engage based upon optimizing weapon engagement ranges?

dd)   Does the system provide recommendations on effector and effect based upon a structured target description (type, size, degree of protection, activity)? Can your system perform target appreciation calculations for weight of fire?  What does your system support in terms of target effects? (e.g. specific level of fractional damage and/or suppression, neutralization, and destruction). Are your target appreciation calculations deterministic and/or probabilistic?

ee)   Can your system triangulate and fuze jammers?

ff)   Does the system allocate engagement data to the most suitable effector platform to suppress/neutralize/destroy the target and minimize collateral damage?

gg)   Can your system provide target handoff?

hh)   Does your system contain Alert states?

ii)   Does your system contain Fire Control Orders (e.g. Fire/Engage, Check Firing/Hold fire/Cease Engagement)?

jj)   Does the system have a target abort capability?

kk)   Is your system able to support different imagery standards?  What resolutions are you able to utilize? What DTED level(s) does your system utilize?

ll)   Can your system display points of origin and points of impact from radar sensors?

mm)   Can your system allow for manual input of entities? (e.g. land tracks, landmarks, etc.)

nn)   Is a user manual available that describes the system and depicts the various features?

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1.6     Robustness

1.6.1     The ability for the joint fires components and systems to access the network at all times regardless of the geographic location, in extreme environmental conditions, hot and cold temperatures, day and night, with dust, mud, rain, snow or ice.

1.6.2     For the C2 system, it must have the ability to operate in a degraded communications environment without suffering degradation or loss of function. As an active spectrum participant, this includes attacks in the cyber and EW domains to include jamming, spoofing, spectrum denial, etc.

- a)     Will the system support 24/7 operations for extended periods of time? Please specify duration.

- b)     To what environmental standards are your system(s) qualified to?

- c)     Will the system be employable under adverse climatic and topographic conditions? Please specify details of the climatic conditions under which the system is operable.

- d)     Will the system operate in day or night operation, in all weather, and in battlefield environments of dust and obscurant?

- e)     Will the system operate in GPS degraded or denied environments?

- f)     Will the system operate in a crowded EW spectrum environment? In what frequency bands does your system function?

- g)     Which Cyber and Electronic Warfare counter measures are employed to protect the system? Has the system been built/accredited using specific cyber assurance methodologies and/or evaluation processes?

- h)     What Electromagnetic Interference (EMI) standard is your system compliant to?

- i)     What Electromagnetic Compatibility (EMC) standards are your systems compliant to?

- j)     For which environmental MIL-STDs and STANAGS are your systems qualified to?

1.7     Responsiveness

1.7.1     The ability for the joint fires systems to contribute to battlefield Situational Awareness (SA), decision making[14], and dissemination of orders in near real-time.[15]

- a)     Does the system display online/active sensors and effectors on the network? What parameters are displayed as part of its status report?

- b)     Does the system have a machine acknowledgement feature (to reduce retransmission of delivered messages), an operator acknowledgement feature? (e.g.: Acknowledge the receipt of a call for fire or message), and/or other features to improve shared situational awareness?

- c)     Can users share/relay information to other specific identified users connected to the network? Via direct messaging or broadcast only?

- d)     Can the network display range bands, effective engagement distances (with meteorological data) for effectors and radiating/sensing arcs for sensors connected to the network?

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[14] Decision making: JFM C2 and targeting software must enable commanders to take quick and informed decision in order to influence the battle and successfully accomplish the objectives.

[15] Not limited to the list. Must include all data creating the COP, targeting data and sensors feed.

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e) If the effector platform utilizes a launcher or a gun system, can the system identify the reload times, maximum rate of fire, sustained rate of fire, traverse limit(s), etc. constraints to the Joint Fires Enabler?

f) If the system has the ability to update and display resource states remaining for effectors connected to the network, what is the latency for updates?

g) What soldier and vehicle platforms have the system been integrated on?

h) Can your system receive target acquisition data from a Joint Fires Enabler and update/refine target locations?

1.8    Training Synthetic Environment

1.8.1    The ability for the joint fires training system to provide realistic and immersive simulation by using in-service equipment or copies of the in-service equipment in customizable mission scenarios.

1.8.2    The ability for the joint fires training system to connect in a scalable joint training environment from the strategic to the tactical level across geographically dispersed simulation locations.

1.8.3    The ability for the joint fires training system to scale the training capability to provide individual or collective training.[16]

1.8.4    The ability for the joint fires training system to be infrastructure agnostic.[17]

a) Please describe the capabilities of the training system. Is it part of the operational system or is it stand alone? If stand alone, can it connect with users on operations?

b) Is there the capacity to interface with other in-service simulators? (e.g.: Royal Canadian Air Force (RCAF) CF-18 pilot simulator).

c) Does the simulator or training mode emulate connectivity and inputs from various sensors and effectors (simulated or as inputs from real platforms)?

d) What are the bandwidth requirements for your networked simulation system?

e) What is the user interface for the system? (e.g.: portable laptop, multiple projector, dome, virtual-reality headset, etc.)

f) Does the system provide the necessary control and monitoring capabilities to objectively provide soldier feedback and progression?

g) Is there an embedded user scenario creator?

h) Is there an instructor station or other means by which to run and supervise scenarios?

i) Does the simulator or training mode provide the necessary control and monitoring capabilities to objectively provide operator/soldier feedback and a level of measured training progression?

j) What is the average duration of the training package(s) to qualify operator(s)/instructor(s) in various roles in the system (in hours or days please)?

---

[16] JFM must allow training scenarios involving different amalgamation of stakeholders. (i.e. full-scale simulation involving Royal Canadian Navy (RCN), RCAF and Canadian Army (CA) or a very small simulation involving one Joint Tactical Air Controller (JTAC), a Forward Observation Officer (FOO) and a CF-18 aircraft)

[17] The simulation system must be fully functional by its hardware and software without infrastructure resources. (i.e. building, classroom)

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k)   Are the entities within the sim scalable? Is it able to implement Canadian-specific entities (vehicles, weapons, equipment, etc.) into the environment?

l)   Is the sim able to accurately mimic lethal weapons effects? (e.g. CAS weapons effects tables, artillery probable error in range (PER) tables, etc.). Are these effects able to influence and damage entities in the sim environment?

m)   Does the environment simulate ballistic paths of weapons?

n)   Are second and third order effects (explosions, smoke, battlefield obscurants, etc.) able to be simulated to the user?

o)   Are non-lethal effects able to be simulated through Artificial Intelligence (AI) in the sim environment?

p)   Can the system provide a degree of fidelity so as to provide trainees with the essential cueing relationship between the stimulus attributes and the appropriate responses?

q)   Is the system accredited in accordance with the JTAC MOA[18]? For which controls?

r)   Can the sim system interface with the Android Tactical Assault Kit (ATAK) and/or Windows Tactical Assault Kit (WinTAK) mapping engines?

s)   Does the system emulate connectivity and inputs from various ground and air-based sensors?

t)   Can the simulation tool be used as a mission planner or rehearsal environment?

u)   Is there an ability to record and playback training? What is the output file format?

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[18] JCAS AP MOA 2004-01, Joint Terminal Attack Controller (JTAC) (Ground), Edition-2, 25 Jan 2013.

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### ANNEX F – JFM SUSTAINMENT QUESTIONS

| Serial | Question |
|---|---|
| **1** | **Availability** |
| 1.1 | Describe the Key Performance Indicators (KPIs) for which you have information about your proposed solution. (e.g. Availability, Mean Time Between Failure, Mean Time to Repair, Mean time between Maintenance). |
| | |
| 1.2 | What would be a reasonable target for the KPIs referenced in Annex B? (e.g. Availability, Mean Time Between Critical Failure, Mean Time to Repair) Please provide evidence to support. |
| | |
| 1.3 | Do you suggest alternative KPIs to what is listed in Annex B? If so describe them and why they are preferable. |
| | |
| 1.4 | Describe your software and hardware tracking of KPIs (e.g. Health and Usage Monitoring Systems (HUMS)). |
| | |
| 1.5 | Can your KPI tracking or HUMS software interface with DRMIS? If so, how? |
| | |
| **2** | **Training Capabilities** |
| 2.1 | Explain how you would provide operator training to the CAF, at delivery and over the 15-year life cycle of the JFM system? |
| | |
| 2.2 | Explain how you would provide maintenance training to the CAF, at delivery and over the 15-year life cycle of the JFM system? |
| | |
| 2.3 | Are you proposing a simulator to conduct operator training? If yes, describe the system and any sustainment requirements unique to the simulator over the 15-year lifecycle of the equipment. |
| | |
| 2.4 | What training aids are required for maintenance training for the JFM system? Are their specific qualifications necessary to safely and effectively perform maintenance on the JFM system? |
| | |
| **3** | **Planned Preventive and Corrective Maintenance** |
| 3.1 | Describe the preventive maintenance cycle required to maintain the JFM system. If known, please include: frequency, level of technical proficiency required (e.g. operator or technician), required time, and any other special considerations (e.g. infrastructure requirements, tooling). |
| | |
| 3.2 | Describe the corrective maintenance requirements for the JFM system. Does your proposed solution have a Logistic Support Analysis Record (LSAR) completed? If so, what type of historical data is it based on? |
| | |
| 3.3 | What planned repair and overhaul is necessary in order to keep the JFM system operational for the planned 15-year lifecycle? |
| | |
| 3.4 | Do you foresee pre-determined replacement intervals of some hardware components? What components do you suggest should be replaced at what interval? |
| | |

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| 4 | **Logistic Support Analysis and Spare Parts Capabilities** |
|---|---|
| 4.1 | Explain how you would provide Logistic Support Analysis (LSA). |
| | |
| 4.2 | Explain how you would provide initial scaling estimates and to propose spare parts levels. |
| | |
| 4.3 | Explain how you would provide spare parts to the Canadian Armed Forces <u>during</u> the initial two-year provisioning period. |
| | |
| 4.4 | Explain how you would provide spare parts to the Canadian Armed Forces <u>after</u> the initial two-year provisioning period. |
| | |
| 4.5 | Explain how you would perform spare parts management, such as warehousing, maintaining and distributing spare parts. |
| | |
| 4.6 | What Mean Time to Deliver Spare Parts (MTTDSP) could you achieve to the main supply depots in Edmonton and Montreal? What MTTDSP could you achieve to CAF bases in Wainwright, Edmonton, Gagetown, Petawawa, Shilo, and Valcartier? |
| | |
| 4.7 | Please describe, if any, the Special Tooling and Test Equipment (STTE) required for your proposed solution. |
| | |
| **5** | **Infrastructure** |
| 5.1 | Describe the requirements for storage of the JFM system. |
| | |
| 5.2 | Describe any special infrastructure requirements for maintenance of the JFM system. |
| | |
| 5.3 | Describe any special infrastructure requirements for a JFM simulator or other training aids. |
| | |
| 5.4 | Based on the parts scaling and general and technical stores requirements, what is the estimated amount of warehouse space required to hold the initial provisioning for the proposed system? |
| | |
| **6** | **Field Service Representative Capabilities** |
| 6.1 | Explain how you would provide Field Service Representatives (FSR) <u>within Canada</u> in order to inspect, repair, test, maintain, equipment, and/or train personnel. FSRs may require security clearance to access restricted areas on CAF bases. |
| | |
| 6.2 | Explain how you would provide Field Service Representatives (FSR) <u>outside of Canada</u> in order to inspect, repair, test, maintain, equipment, and/or train personnel. FSRs may require security clearance to access restricted areas on CAF bases. |
| | |
| 6.3 | Explain how you would to provide Field Service Representatives (FSR) in <u>a theatre of operation</u> in order to inspect, repair, test, maintain, equipment, and/or train personnel. FSRs may require security clearance to access restricted areas and airfields. |
| | |
| 6.4 | Explain how you would support JFM fleets remotely. (e.g. via onboard computers) |
| | |

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| 7 | **Service Facility Capabilities** |
|---|---|
| 7.1 | Explain how you would provide maintenance services to support 1st and 2nd line CAF maintenance organizations at facilities in Canada and internationally. |
| | |
| 7.2 | Explain how you would provide 3rd and 4th line maintenance at service facilities in Canada and internationally. |
| | |
| 8 | **Engineering (System, Sub-system, or Component Reliability Assessment / Failure Analysis) Capabilities** |
| 8.1 | Explain how you would provide Technical Investigations/Studies and Engineering Support for the JFM system at delivery, and over its 15-year lifecycle. |
| | |
| 8.2 | Explain how you would collaborate with senior CAF technicians, other government organizations and third-party specialist contractors as part of a flexible sustainment solution. |
| | |
| 9 | **Technical Data Package Capabilities** |
| 9.1 | Explain how you would provide technical publications described in Annex B. |
| | |
| 9.2 | Explain how you would update and maintain technical publications during the 15-year lifecycle for the JFM. |
| | |
| 9.3 | Which (if any) of your publications are available in English and/or French? |
| | |
| 10 | **Configuration / Obsolescence Management Capabilities** |
| 10.1 | Explain how you would perform configuration management services during the 15-year lifecycle. |
| | |
| 10.2 | Explain how you would perform obsolescence management during the 15-year lifecycle for the JFM. |
| | |
| 11 | **Intellectual Property** |
| 11.1 | What, if any, ITAR (International Traffic in Arms Regulations), Technical Assistance Agreement, or Controlled Goods Program restrictions exist for any part of the equipment? |
| | |
| 11.2 | Does your proposed system or its components have any export or licence restrictions? If so, list them. |
| | |
| 11.3 | What, if any are your concerns with the use of SACC clause 4006 in the terms of the JFM project? |
| | |
| 11.4 | What, if any are your concerns with the use of SACC clause 4003 for the software of the JFM project? |
| | |
| 12 | **Testing** |
| 12.1 | Describe what testing your proposed system has already undergone. Is the data accessible to DND? |
| | |
| 12.2 | Describe the tests you recommend for the JFM to most efficiently demonstrate it conforms to the performance requirements. |
| | |
| 13 | **Software** |

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| 13.1 | Describe software requirements for your proposed JFM solution(s). |
|---|---|
| | |
| 13.2 | Explain how you would provide software support services for the JFM system at delivery, and over the 15-year lifecycle of the JFM system. |
| | |
| 13.3 | Explain how you would provide Software-as-a-Service (SaaS) on a subscription based-model for the JFM software. |
| | |
| 13.4 | Explain how you would provide cloud-based software services to support JFM in garrison, in the field, and on operations internationally. Describe your proposed technical interface with Canada. |
| | |
| 13.5 | Explain how you would interface and integrate with other contractors/OEM to provide software services. |
| | |
| 13.6 | Describe the network architecture requirements for your system. If your system is a server-based system explain the redundancy required to achieve an operational availability of 99.9% |
| | |
| 13.7 | Explain how you would insert features for new sensors or weapons that are delivered into the CAF inventory. |
| | |
| 13.8 | Explain how you would evolve the software system over time in order to support changing CAF capabilities. |
| | |
| 13.9 | Do your proposed software solutions have existing customers? If yes, describe the user base. |
| | |
| 13.10 | Describe the cycle of updates your software(s) typically receives in terms of capability, interface, and time between updates. |
| | |
| 13.11 | If you are proposing a 'Canadianized' variant of an existing software, explain how you would align features with existing software. |
| | |
| **14** | **Transportability** |
| 14.1 | What are the dimensions of the system when it is being transported? What is the mass? |
| | |
| 14.3 | Describe any special considerations for transporting the proposed solution on Canadian highways. |
| | |
| 14.4 | Describe any special considerations for transporting the proposed solution on highways internationally. |
| | |
| 14.5 | Describe special considerations for the proposed solution to be transported off-road. |
| | |
| 14.6 | Describe any special considerations for transporting the proposed solution by seafaring vessels. |
| | |
| 14.7 | Describe the suitability for the proposed solution to be transported by Canadian airframes (e.g. C130, C17). |
| | |
| 14.8 | Describe the suitability for the proposed solution to be transported by rail. |
| | |

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| 14.9 | Describe the time preparation requirements for preparing JFM system for transport by the above methods, and any time requirements upon disembarkation before the system can be made operational (if any). |
|---|---|
| | |
| **15** | **Supportability** |
| 15.1 | Describe any special maintenance requirements for the system to function in adverse conditions (e.g. cold, hot, humidity, high winds, rain/snow, and dust). If there are difference maintenance schedules |
| | |

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## ANNEX G – JFM ACRONYMS

| ABCANZ | America, Britain, Canada, Australia, and New Zealand Armies |
|---|---|
| ACA | Airspace Coordination Area |
| ACIS | Army Communication and Information Systems Specialist |
| AGM | Attack Guidance Matrix |
| AI | Artificial Intelligence |
| ArtyMIS | Artillery Managed Information System |
| ASCA | Artillery Systems Cooperation Activities |
| ASCC | Airspace Coordination Centre |
| ATACMS | Army Tactical Missile System |
| ATAK | Android Tactical Assault Kit |
| ATG | Artillery Tactical Group |
| AWR | Additional Work Request |
| BC TAC | Battery Commander Tactical Command Post |
| BDZ | Base Defense Zone |
| CA | Canadian Army |
| CAF | Canadian Armed Forces |
| CAS | Close Air Support |
| C2 | Command and Control |
| C4ISR | Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance |
| CDE | Collateral Damage Estimate |
| CFB | Canadian Forces Base |
| CFL | Coordinated Fire Lines |
| CM | Configuration Management |
| COP | Common Operating Picture |
| CO TAC | Commanding Officer Tactical Command Post |
| CSNI | Consolidated Secret Network Infrastructure |
| DND | Department of National Defence |
| DGMS | Digital Gun Management System |
| DRMIS | Defence Resource Management Information System |
| DTED | Digital Terrain elevation Data |
| EMC | Electromagnetic Compatibility |
| EMI | Electromagnetic Interference |
| EO | Electronic-Optronic |
| EPLRS | Enhanced Position Location Reporting System |
| EW | Electronic Warfare |
| FFA | Free-fire Area |
| FOO | Forward Observation Officer |
| FSCC | Fire Support Coordination Centre |

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| FSCL | Fire Support Coordination Line |
|---|---|
| FSR | Field Service Representative |
| FVEY | Five Eyes |
| GAJT | GPS Anti-Jam Technology |
| GFE | Government Furnished Equipment |
| GFI | Government Furnished Information |
| GoC | Government of Canada |
| GPS | Global Positioning System |
| GSM | Government Supplied Material |
| HAFEZ | Hostile Aircraft Free Engagement Zone |
| HLMR | High Level Mandatory Requirements |
| HPTL | High Payoff Target List |
| HUMS | Health and Usage Monitoring Systems |
| IFCSS | Indirect Fire Control Software Suite |
| IFF | Identification Friend or Foe |
| ILS | Integrated Logistic Support |
| IP | Intellectual Property |
| ISS | In-Service Support |
| JFM | Joint Fires Modernization |
| JPTL | Joint Priority Target List |
| JTAC | Joint Terminal Attack Controller |
| KPI | Key Performance Indicators |
| LAV-6 | Light Armoured Vehicle 6 |
| LAV OPV | Light Armoured Vehicle Observation Post Vehicle |
| LCSS | Land Command Support System |
| LRU | Line Replaceable Units |
| LSA | Logistic Support Analysis |
| LSAR | Logistic Support Analysis Record |
| MDT | Mean downtime |
| METCM | Standard Computer Meteorological Message |
| METGM | Standard Gridded Data Meteorological Message |
| METTA | Standard Target Acquisition Meteorological Message |
| MGRS | Military Grid Reference System |
| MIDB | Modernized Integrated Database |
| MLRS | Multiple Launch Rocket System |
| MMDS | Materiel Management and Distribution System |
| MOA | Memorandum of Agreement |
| MSI | Maintenance Significant Item |
| MTBF | Mean operating time between failures |
| MTBM | Mean time between maintenance |

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| MTTDSP | Mean time to deliver spare parts |
|---|---|
| MTTR | Mean time to repair |
| NATO | North Atlantic Treaty Organization |
| NFA | No Fire Area |
| NORAD | North American Aerospace Defence |
| OEM | Original Equipment Manufacturer |
| PER | Probable error in range |
| PGK | Precision Guidance Kit |
| PGM | Precision guided munitions |
| PMO | Project Management Office |
| R&O | Repair and Overhaul |
| RCAF | Royal Canadian Air Force |
| RCN | Royal Canadian Navy |
| RFA | Restricted Fire Area |
| RFL | Restricted Fire Line |
| ROZ | Restricted Operating Zone |
| RPAS | Remotely piloted aerial systems |
| RSPL | Recommended Spares Parts List |
| SA | Situational Awareness |
| SAAFR | Standard Use Army Aircraft Flight Route |
| SaaS | Software-as-a-Service |
| SACC | Standard acquisition clause and condition |
| SITS | Special Investigations and Technical Studies |
| SSE | Strong, Secure, Engaged |
| STACC | Surveillance and Target Acquisition Coordination Centre |
| STTE | Special Tooling and Test Equipment |
| TACP | Tactical Air Control Party |
| TDL | Tactical Data Link |
| TIES | Technical Investigation and Engineering Support |
| TLAM | Tomahawk Land Attack Missile |
| TST | Time-sensitive targets |
| UPS | Universal Polar Stereographic |
| UTM | Universal Transverse Mercator |
| VMF | Variable Message Format |
| WinTAK | Windows Tactical Assault Kit |

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**ANNEX H – NON-DISCLOSURE AGREEMENT**

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**NON-DISCLOSURE AGREEMENT**
**JOINT FIRES MODERNIZATION PROJECT**

</div>

This Agreement made in duplicate this_____ day of _____201____.
                              (Day number)          (Month)        (Year)

BETWEEN        Her Majesty the Queen in Right of Canada as Represented by the Minister of Public Works
               and Government Services ("Canada")

AND            _____ receiving the unclassified
                         (Full legal name of organization in print)
               information as constituted pursuant to the laws of _____ and having a
                                                                   (Insert laws in print)
               place of business at _____ (the "Recipient").
                                     (Complete address in print)

Whereas Canada has issued a Request for Information (RFI) No. W8476-195949/A, to solicit information for
the Joint Fires Modernization (JFM) Project; and

Whereas in accordance with the provisions of the RFI Canada has provided for the disclosure of certain
information listed in Appendix 1 to Annex A of the RFI ("Information"); and

Whereas the Recipient wishes to receive the Information solely for the purpose of preparing a response to the
JFM RFI.

Therefore, in consideration of the premises and the mutual promises, conditions and agreements of this
Agreement the Parties hereto agree as follows:

1.      Subject to the terms and conditions of this Agreement Canada agrees to disclose the Information to
the Recipient on an as requested basis.

2.      The Recipient agrees that it shall use the Information solely for the purpose of preparing a response to
the JFM RFI and for no other purpose.

3.      The Recipient acknowledges that the Information may be subject to certain proprietary rights belonging
to various parties and shall not be used by the Recipient or disclosed to anyone at any time except for the
purposes of, and in accordance with, this Agreement and for no other purpose and shall ensure that its
personnel do likewise.

4.      The Recipient shall not disclose the Information to anyone unless and until the proposed recipient has
signed an agreement in terms identical to this Agreement with the necessary changes to reflect names,
addresses, offices and the like. Such disclosure shall be made only to a recipient with a need to know and
solely for the purposes of the preparation of a proposal in response to the JFM RFI.

5.      The Recipient shall not copy, reproduce or otherwise duplicate the Information or any information
reflecting the Information in whole or in part or allow others to do so for any purposes other than the
preparation of a bid in response to this JFM RFI unless Canada has given its express, prior, written approval.

6.      Whether in storage or in use, the information shall be protected by the Recipient with the same degree
of care as the Recipient uses to protect its own proprietary intellectual property of like importance against
public disclosure, but in no case any less than reasonable care.

7.      The Recipient shall return the Information when it is no longer required for the preparation of a
proposal in response to the JFM RFI, when required by Canada to do so, or with its proposal. In like fashion

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the Recipient shall return any copies it may have been allowed to make which are in a media that is capable of being sent with the proposal, shall destroy any other copies or any information reflecting the Information on any media whatsoever, and shall ensure that anyone to whom the Information has been divulged do likewise. Those who do not submit a proposal must nevertheless comply with this paragraph by the Closing Date of the JFM RFI.

8.      The obligations herein contained shall survive the submission of a bid and the performance of any contract awarded and shall continue thereafter in full force and effect.

9.      This Agreement shall be interpreted, and the relationship of the parties be determined, in accordance with the laws in force in the province of Ontario in Canada.

IN WITNESS THEREOF, this Agreement has been executed by duly authorized officers of


_____
     (Name of Recipient in print)



Per: _____          _____
          (Name of duly authorized officer in print)                      (Title of duly authorized officer in print)



_____          _____
          (Signature of duly authorized officer)                  (Date in print)