

**RETURN BIDS TO:**  
**RETOURNER LES SOUMISSIONS À:**  
Bid Receiving - PWGSC / Réception des  
soumissions - TPSGC  
11 Laurier St./11, rue Laurier  
Place du Portage, Phase III  
Core 0B2 / Noyau 0B2  
Gatineau  
Québec  
K1A 0S5  
Bid Fax: (819) 997-9776

**LETTER OF INTEREST**  
**LETTRE D'INTÉRÊT**

Comments - Commentaires

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

Issuing Office - Bureau de distribution  
Alternative Service Delivery/Autres modes de prestation  
des services  
11 Laurier/11 rue Laurier  
7B3, Place du Portage Phase III  
Gatineau  
Québec  
K1A 0S5

<b>Title - Sujet</b> RFI-ENGINEERING FLIGHT TEST RATION.	
<b>Solicitation No. - N° de l'invitation</b> W8485-15EFTR/A	<b>Date</b> 2015-07-31
<b>Client Reference No. - N° de référence du client</b> W8485-15EFTR	<b>GETS Ref. No. - N° de réf. de SEAG</b> PW-\$PSD-015-25299
<b>File No. - N° de dossier</b> 015psd.W8485-15EFTR	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2015-09-09</b>	
<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT	
<b>F.O.B. - F.A.B.</b> Specified Herein - Précisé dans les présentes <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input checked="" type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Yachuk, Dwight	<b>Buyer Id - Id de l'acheteur</b> 015psd
<b>Telephone No. - N° de téléphone</b> (819) 956-0741 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> DEPARTMENT OF NATIONAL DEFENCE 101 COLONEL BY DR. ATTN: D MAJ PROC 6-2 OTTAWA Ontario K1A0K2 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

<b>Delivery Required - Livraison exigée</b> See Herein	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

Solicitation No. - N° de l'invitation

W8485-15EFTR/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

015psd

Client Ref. No. - N° de réf. du client

W8485-15EFTR

File No. - N° du dossier

015psdW8485-15EFTR

CCC No./N° CCC - FMS No/ N° VME

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Please see attached documents

## **PARTICIPATION AGREEMENT**

### **Rules of Engagement**

The Dispute Resolution Process of the Rules of Engagement will be discussed and finalized at the Industry Engagement Session. Sign off by participants will be required in order to attend the Industry Engagement Session and One-on-One meetings.

- 1) An overriding principle of the industry engagement is that it be conducted with the utmost of fairness and equity between all parties. No one person or organization shall receive nor be perceived to have received any unusual or unfair advantage over the others.
- 2) These Rules of Engagement will apply beginning with the signing of this document and conclude with the release of any Request(s) for Proposal (RFP) on the Government Electronic Tendering Service (Buy and Sell).
- 3) All Crown documentation provided throughout the industry engagement process, which began with the 26 February 2015 Community Consultation and concludes with the posting of any official Request(s) for Proposal on Buy and Sell, will be provided to all participants who have agreed to and signed the Rules of Engagement ("Participant").
- 4) The remaining elements of the Engagement Process will consist of an Industry Engagement Session, Ono-on-One Industry Meetings, and any other processes deemed necessary by the Contracting Authority.
- 5) This Request for Information (RFI) is the basis to move forward with the Engagement Process.
- 6) In order to maximize the benefits of the Engagement Process, Canada will endeavor to solicit comments from Participants on the requirements identified in the RFI.
- 7) Any solutions, ideas or issues raised during the One-on-One sessions will be first analyzed for further consideration by Canada.
- 8) Any issues, recommendations, solutions or ideas raised during the One-on-One meetings and accepted by Canada, shall be posted for consideration on Buy and Sell.
- 9) If deemed necessary, an agenda with discussion topics and any applicable supporting documentation will be provided to Participants in advance of the Industry Engagement Session.
- 12) Canada will not disclose proprietary or commercially sensitive information concerning a Participant to other Participants or third parties, except and only to the extent required by law.

## **Terms and Conditions**

The following terms and conditions apply to the Engagement Process. In order to encourage open dialogue, Participants agree to the following:

- 1) Participants are expected to discuss their views concerning the Engineering Flight Test Rationalization (EFTR) Initiative, and to provide positive feedback on the elements identified in the RFI. Everyone shall have equal opportunity to share their ideas and suggestions;
- 2) Participants will NOT reveal any information to, or discuss any aspect of the EFTR Initiative with, the MEDIA during this engagement process. If participants receive a question from the Media, participants are to direct the Media to contact the PWGSC Media Relations Office at 819-956-2313;
- 3) Participants are to direct inquiries and comments only to authorized representatives of Canada, as directed in notices given by the Contracting Authority from time to time. Any communication to unauthorized representatives of Canada may be subject to full disclosure by Canada on Buy and Sell;
- 4) Media cannot participate in the Industry Engagement session, one-on-one meetings or any other processes deemed necessary by the Contracting Authority;
- 5) Canada is not obligated to issue any RFP, or to negotiate any contract for the EFTR Initiative;
- 6) If Canada does release a RFP, the terms and conditions of the RFP shall be subject to Canada's absolute discretion;
- 7) Canada will not reimburse any person or entity for any cost incurred in participating in this industry engagement process;
- 8) Participation is not a mandatory requirement. Not participating in this engagement process will not preclude a bidder from submitting a proposal;
- 9) If required, a draft RFP will be released to all Participants for comments. If required, a Working Group Session will be organized;
- 10) Failure to agree to and sign the Rules of Engagement will result in the exclusion from participation in the Industry Engagement session, one-on-one meetings and review of the draft RFP;
- 11) A dispute resolution process to manage impasses throughout this engagement process shall be adhered to as described below. All requests to use the dispute resolution process shall be directed to the Contracting Authority who will make the appropriate arrangements; and
- 12) During the engagement process, documentation may be presented in either official language depending on availability. Documentation will not necessarily be translated.

## **Dispute Resolution Process**

1) By informal discussion and good faith negotiation, each of the parties shall make all reasonable efforts to resolve any dispute, controversy or claim arising out of or in any way connected with this Industry Engagement.

2) Any dispute between the Parties of any nature arising out of or in connection with this Industry Engagement shall be resolved by the following process:

a. Any such dispute shall first be referred to the Participant's Manager and the PWGSC Manager responsible for the Industry Engagement. The parties will have three Business Days in which to resolve the dispute.

b. In the event the representatives of the Parties specified Article 2.a. above are unable to resolve the dispute, it shall be referred to the Participant's Project Director and the PWGSC Senior Director of the Division responsible for the Industry Engagement. The parties will have three Business Days to resolve the dispute.

c. In the event the representatives of the Parties specified in Article 2.b. above are unable to resolve the dispute, it shall be referred to the Participant's Senior Representative responsible for this project and the PWGSC Director General, who will have three Business Days to resolve the dispute.

d. In the event the representatives of the Parties specified in Article 2.c. above are unable to resolve the dispute, it shall be referred to the Participant's CEO and the PWGSC Assistant Deputy Minister, Acquisitions Branch, who will have five Business Days to resolve the dispute.

e. In the event the representatives of the Parties specified in Article 2.d. above are unable to resolve the dispute, the Contracting Authority shall render a written decision within five Business Days, which shall include a detailed description of the dispute and the reasons supporting the Contracting Authority's decision.

f. The Contracting Authority shall deliver a signed copy of the written decision to the Participant.

By signing this document, the individual represents that he/she has full authority to bind the company listed below and that the individual and the company agree to be bound by all the terms and conditions contained herein.

**Name of Company:** \_\_\_\_\_

**Name and Title of Company Individual:** \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**PWGSC Contracting Authority:**  
**Dwight Yachuk**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**DND Project Authority:**  
**Karen Eiblmeier**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**DND Procurement Authority:**  
**Gwen Walsh**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **EFTR WORK PACKAGE FOR: Rotary Wing Proficiency Flying**

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### **REFERENCE:**

TC & DND MOU – Airworthiness Oversight of Civilian Air Operators and Aircraft Contracted to Conduct Military Missions for DND, DND ID No 2004072851, (TCCA) RDIMS 5200-43 (RDIMS # AEPM 412957).

## **1 INTRODUCTION**

Engineering Flight Test Rationalization is a specific activity under the Defence Renewal. The lead for Engineering Flight Test Rationalization is Assistant Deputy Minister (Materiel), Director General Aerospace Equipment Program Management. Engineering Test and Evaluation services are delivered to the Assistant Deputy Minister (Materiel) organization by the Aerospace Engineering Test Establishment (AETE), a lodger unit located at 4 Wing Cold Lake, Alberta. The Commanding Officer AETE reports to the Director General Aerospace Equipment Program Management.

Defence Renewal is organized under two main Renewal Actions: Performance and Organizational Practices. The Sustainment Initiative (also commonly referred to as Maintenance Program Design) falls under Performance Renewal and specifically under the theme “Maintenance and Materiel”. The Sustainment Initiative will focus on achieving renewal to maintenance programs and sustainment procurement, as well as other sustainment efficiencies.

The Sustainment Initiative consists of four main activities:

- In-Service Support Procurement;
- Maintenance Program Rationalization;
- Professional Development; and
- Engineering Flight Test Rationalization.

This document addresses the Engineering Flight Test Rationalization element of the Sustainment Initiative. The goal of the Engineering Flight Test Rationalization initiative is to increase efficiency in the delivery of aerospace engineering test and evaluation capabilities in order to reduce the costs of operations, release military positions and aircraft for higher priority operational deployment and to ensure that engineering test and evaluation service delivery is sustainable over the longer term.

Engineering flight test and evaluation services are required by the Canadian Armed Forces to ensure the airworthiness of aircraft and aircraft systems. AETE has been delivering these critical support services to DND Weapon System Management organizations and Major Capital Project Management Offices since the unit was re-located to Alberta in 1971 from Ottawa.

## **2 PURPOSE**

The objectives of this document are:

1. To provide sufficient background information so that industry can understand the objectives of the program in order to determine their interest in participating in the Engineering Flight Test Rationalization initiative and in what manner; and
2. To continue industrial engagement in order for Canada and Industry to understand and formulate strategies whereby industry may effectively support Engineering Flight Test Rationalization objectives in a mutually beneficial manner.

## **3 SCOPE**

### ***3.1 EFTR Scope***

The scope of the Engineering Flight Test Rationalization initiative includes:

1. Capability Rationalization. Some capabilities currently existing at AETE may not be totally relevant in today's test and evaluation. Such capability could be divested entirely providing immediate savings in both personnel and cost.
2. Location. The existing location of AETE in Cold Lake provides easy access to a large restricted airspace and evaluation ranges. The remoteness of Cold Lake may however preclude the sharing of resources, both in terms of personnel and facilities, with other government departments and agencies as well as potentially limit industry interactions. The review of an alternate location is considered necessary to analyze all possible options.



3. Outsourcing. Outsourcing will be analyzed thoroughly in consideration of similar initiatives implemented by Canada's allies and in full recognition of Canadian industrial capabilities. There is the intent to retain a distinguishable DND in-house test and evaluation capability in order to maintain a smart-buyer capability both for flight test services and for new aerospace platform and system deployment. Outsourcing options will include consideration of innovative business models including such constructs as Public-Private partnerships.

### ***3.2 Work Package Scope***

This work package addresses the Rotary Wing Proficiency Flying requirements for the Engineering Flight Test Rationalization Project.

Proficiency flying operations ensure that AETE flight test personnel can effectively plan, conduct and report on flight and ground test operations. Proficiency flying operations support the performance assurance for Qualified Test Pilots, Flight Test Engineers and Qualified Systems Evaluators. Proficiency flying hours are, however, based on the minimum requirements for Qualified Test Pilot currency as specified by the Royal Canadian Air Force.

It is stressed that proficiency flying does not include project support flying and is conducted within the approved flight envelope of the aircraft.

This Request for Information is seeking novel ways of achieving proficiency flying requirements for AETE flight test crews. Flying hour requirements, as well as essential and desirable aircraft capability requirements, are specified in Section 4 of this work package and industry is invited to propose methods of satisfying these requirements for consideration by DND as well as alternate means for ensuring optimal flight test crew efficiency.

## **4 REQUIREMENTS**

### ***4.1 General***

DND requires the provision of flying hours to satisfy AETE Rotary Wing instrument and visual proficiency flying requirements as further detailed hereunder. Flying hours must be provided at the airfield where AETE is located (which may be in a new location) in accordance with the initial requirements identified in this Request for Information and as further specified in any subsequent Request(s) for Proposal that may be issued. The tasking and scheduling of the provision of flying hours will be controlled by DND. The proficiency missions will be flown on any day of the week (including weekends) at any time of day and night under Visual Flight Rules and Instrument Flight Rules, together with a requirement to conduct both precision and non-precision approaches.

The proficiency missions will be flown in accordance with DND Flying Orders and procedures. Technical airworthiness of the aircraft will remain under the oversight of Transport Canada Civil Aviation. However, civil aircraft conducting military missions for DND are classed as military aircraft in accordance with the Aeronautics Act and Ministerial delegations to the DND Operational, Technical and Investigative Airworthiness Authorities. Therefore, DND will also exercise airworthiness oversight in accordance with Reference and the Contractor must support DND airworthiness audits at Contractor and DND facilities. Audits will address airworthiness

documentation such as, but not limited to, maintenance records, quality control procedures, component history data and log books.

Projected base and surge flying hours and availability requirements are specified in section 4.2 of this Request for Information.

The contractor will be required to provide all maintenance, servicing and logistics support as specified in section 4.3 of this Request for Information.

The essential and desirable characteristics of suitable aircraft are specified in section 4.4 and 4.5 of this Request for Information.

AETE pilots who have achieved DND wings standard (or DND-recognized equivalency from other nations) and successfully completed initial type conversion training recognized by the contractor will act as Pilot-In-Command of all proficiency flights.

All flights in proposed aircraft may also have an AETE pilot or non-pilot aircrew occupying the second aircraft seat. The non-pilot aircrew will typically be a Flight Test Engineer or Qualified Systems Engineer. Other personnel, military and/or civilian, may be authorized by AETE to fly in the proposed aircraft as a passenger or technical crew member.

Once qualified on type, DND will fly the aircraft without contractor pilots in the aircraft.

Proposed aircraft must meet all applicable airworthiness, legal and insurance requirements and standards stipulated in Transport Canada Canadian Air Regulations for a commercial rental aircraft.

Proposed aircraft should be available for Canada / continental United States cross country training, including overnight stops without a contractor technical crew member (Aircraft Maintenance Engineer support).

## ***4.2 Aircraft Flying Hour Requirements***

DND is exploring options for meeting proficiency flying requirements. Project flying that is performed in DND aircraft contributes to the achievement of minimum proficiency flying requirements. At this point in the options analysis, the minimum and maximum yearly flying hours required are as follows:

1. Minimum 200 flying hours per year,
2. Maximum 300 flying hours per year,
3. Quarterly and monthly hours may be assumed to be the above figures, divided by 4 or 12 as applicable, and
4. Daily availability is to be specified by the contractor in accordance with the above flying hour requirements, but is to ensure that the maximum schedule flexibility can be provided.
5. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. The bulk of missions will be daily out and back or single overnight trips anywhere in North America. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity.

### ***4.3 Maintenance and Servicing Requirements***

The contractor shall be responsible to provide sufficient aircraft to support the usage for DND proficiency requirements at the AETE location. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. As well, typical usage (excluding cross-country or night flying) will normally occur between the hours of 0800 and 1600 hours on working days (a day that is not a weekend, a designated holiday). The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity. DND will provide 3 working days notice of specific scheduling requirements. The bulk of missions will be daily out and back or single overnight trips anywhere in North America.

The normal hours of operation may be extended, if required, for weekdays mornings (from 0600 and 0800 hours), for weekday evenings (from 1600 and 2000 hours), and for night vision training possibly until 2300 hrs, depending upon the time of year.

The contractor shall be responsible for all maintenance required to service, inspect and rectify any aircraft malfunction while the aircraft is being operated by AETE crew both at the AETE operating base or any other airport at which the aircraft may be located. The contractor must be experienced and competent in the control of maintenance of an aircraft fleet, and must either be registered as a private operator under Canadian Aviation Regulation 604 or hold an Air Operator Certificate issued by Transport Canada Civil Aviation in accordance with Canadian Aviation Regulations Part VII.

The daily minimum servicing/maintenance requirement is for a Daily Inspection and whatever maintenance is due on the aircraft in accordance with an approved maintenance schedule. There is no requirement to have an Aircraft Maintenance Engineer on-site 24 hours 7 days per week; however, it is expected that, barring unforeseen circumstances, a maintenance presence will be on-site during regular local business hours (0800-1600 Monday to Friday). Outside of these requirements an on-call posture can be assumed. The overriding requirement is that aircraft meet their mission departure times.

The contractor will be required to provide Daily Inspection training and authorization for all Royal Canadian Air Force pilots involved in the operation.

If AETE is located on a Canadian Forces base, DND will provide hangar space or storage area for tools, spare parts and working space for contractor support personnel.

Maintenance shall be performed by a Transport Canada Approved Maintenance Organization and by technicians holding valid Canadian Aircraft Maintenance Engineers licenses.

The aircraft shall be in a configuration which complies with the aircraft type approval.

DND will provide petroleum, but the contractor is responsible for the provision of oil and lubrication products. The contractor shall provide any required aircraft-specific maintenance support equipment, including towing vehicle. The contractor must provide sufficient personnel for the following basic servicing activities: towing, parking, refuelling and washing the aircraft.

On missions away from the AETE location, DND will pay military personnel travel and aircraft fuel expenses but aircraft handling costs, including but not limited to landing, hangarage and navigation service fees, and any on the road maintenance costs (including aircraft recovery) will be paid by the contractor. The contractor may want to consider a mobile repair capability.

If an aircraft becomes unserviceable, a replacement aircraft shall be provided within 3 working hours, when the aircraft is located at the AETE location and within one day when the aircraft is away from the AETE location.

#### ***4.4 Proficiency Aircraft Essential Requirements***

The following aircraft characteristics are considered essential to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Respondents are requested to identify aircraft that would meet these requirements as well as budgetary cost estimates for provision of these aircraft based on a 3-5 year lease period.

1. Modern light to medium twin engine helicopter.
2. Three axis autopilot.
3. Instrument Flight Rules certified.
4. Full Authority Digital Engine Controls.
5. Global Positioning System / Area Navigation certified.
6. Full glass cockpit.
7. Seating, controls and primary flight instruments for two pilots.
8. Third forward facing crew seat positioned aft of the pilot cockpit seats allowing a partial view of the instrument panel.
9. Single pilot certified, at minimum for Visual Flight Rules.
10. Can operate in a temperature range of ISA -45°C to +25°C including self-starting.
11. Can operate in surface winds up to 30 knots at 2000 feet Pressure Altitude, ISA +25°C.
12. Can operate at all altitudes up to 10000 feet Pressure Altitude.
13. Slope Landing up to at least 7°.
14. Intercom system compatible with HGU-56 helmet.
15. Intercom system available to third crew seat including the ability to select radios.
16. Climate control and ventilation system able to maintain the cockpit at a minimum of 5°C or greater.
17. If skid equipped, provision for installation of removable wheels for movement of aircraft into a hangar when the aircraft is away from AETE location.

18. Provide Night Vision Goggle compatibility.

These essential requirements will become the core mandatory requirements in any subsequent Request(s) for Proposal that may be issued, although other mandatory requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these essential criteria is invited.

**4.5 Proficiency Aircraft Desirable Characteristics**

The following aircraft characteristics are considered desirable to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Contractors are encouraged to propose aircraft for consideration that meet the following criteria:

1. Aircraft attitude limits no less than +/- 60 degrees roll and +/- 30 degrees pitch.
2. Can hover in wind conditions up to 35 knots at any azimuth, at 2000 feet Pressure Altitude, ISA +25°C.
3. Maintain level cruise flight speed of at least 120 knots True Airspeed from sea level to 3000 feet Pressure Altitude.
4. Climate control and ventilation system able to maintain cockpit at a maximum of 25°C or lower.
5. Required Navigation Performance is to be specified and should be at minimum Required Navigation Performance 3.
6. Ultra High Frequency radio.
7. Full Authority Digital Engine Controls with one engine inoperative training mode.
8. Four axis autopilot.
9. Databus access in flight for Flight Test Engineer training purposes.
10. Health Usage Monitoring System data bus access, post flight.
11. Contractor willingness to allow modification on a non-destructive and fully removable basis to add airworthiness approved flight test instrumentation to practice remote flight test data gathering in real time. Note that this is for training purposes only and not for DND flight test project functionality.

These desirable requirements will become the rated requirements in any subsequent Request(s) for Proposal that may be issued, although other desirable requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these desirable criteria is invited.

## **EFTR WORK PACKAGE FOR: Multi Engine Proficiency Flying**

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## **2 PURPOSE**

The objectives of this document are:

3. To provide sufficient background information so that industry can understand the objectives of the program in order to determine their interest in participating in the Engineering Flight Test Rationalization initiative and in what manner; and
4. To continue industrial engagement in order for Canada and Industry to understand and formulate strategies whereby industry may effectively support Engineering Flight Test Rationalization objectives in a mutually beneficial manner.

## **3 SCOPE**

### ***3.1 EFTR Scope***

The scope of the Engineering Flight Test Rationalization initiative includes:

4. Capability Rationalization. Some capabilities currently existing at AETE may not be totally relevant in today's test and evaluation. Such capability could be divested entirely providing immediate savings in both personnel and cost.
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### **3.2 Work Package Scope**

This work package addresses the Multi Engine Proficiency Flying requirements for the Engineering Flight Test Rationalization Project.

Proficiency flying operations ensure that AETE flight test personnel can effectively plan, conduct and report on flight and ground test operations. Proficiency flying operations support the performance assurance for Qualified Test Pilots, Flight Test Engineers and Qualified Systems Evaluators. Proficiency flying hours are, however, based on the minimum requirements for Qualified Test Pilot currency as specified by the Royal Canadian Air Force.

It is stressed that proficiency flying does not include project support flying and is conducted within the approved flight envelope of the aircraft.

This Request for Information is seeking novel ways of achieving proficiency flying requirements for AETE flight test crews. Flying hour requirements, as well as essential and desirable aircraft capability requirements, are specified in Section 4 of this work package and industry is invited to propose methods of satisfying these requirements for consideration by DND as well as alternate means for ensuring optimal flight test crew efficiency.

## **4 REQUIREMENTS**

### **4.1 General**

DND requires the provision of flying hours to satisfy AETE Multi Engine Aircraft instrument and visual proficiency flying requirements as further detailed hereunder. Flying hours must be provided at the airfield where AETE is located (which may be in a new location) in accordance with the initial requirements identified in this Request for Information and as further specified in any subsequent Request(s) for Proposal that may be issued. The tasking and scheduling of the provision of flying hours will be controlled by DND. The proficiency missions will be flown on any day of the week (including weekends) at any time of day and night under Visual Flight Rules and Instrument Flight Rules, together with a requirement to conduct both precision and non-precision approaches.

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Projected base and surge flying hours and availability requirements are specified in section 4.2 of this Request for Information.

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Once qualified on type, DND will fly the aircraft without contractor pilots in the aircraft.

Proposed aircraft must meet all applicable airworthiness, legal and insurance requirements and standards stipulated in Transport Canada Canadian Air Regulations for a commercial rental aircraft.

Proposed aircraft should be available for Canada / continental United States cross country training, including overnight stops without a contractor technical crew member (Aircraft Maintenance Engineer support).

## ***4.2 Aircraft Flying Hour Requirements***

DND is exploring options for meeting proficiency flying requirements. Project flying that is performed in DND aircraft contributes to the achievement of minimum proficiency flying requirements. At this point in the options analysis, the minimum and maximum yearly flying hours required are as follows:

6. Minimum 400 flying hours per year,
7. Maximum 450 flying hours per year,
8. Quarterly and monthly hours may be assumed to be the above figures, divided by 4 or 12 as applicable, and
9. Daily availability is to be specified by the contractor in accordance with the above flying hour requirements, but is to ensure that the maximum schedule flexibility can be provided.
10. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. The bulk of missions will be daily out and back or single overnight trips anywhere in North America. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity.

### ***4.3 Maintenance and Servicing Requirements***

The contractor shall be responsible to provide sufficient aircraft to support the usage for DND proficiency requirements at the AETE location. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. As well, typical usage (excluding cross-country or night flying) will normally occur between the hours of 0800 and 1600 hours on working days (a day that is not a weekend, a designated holiday). The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity. DND will provide 3 working days notice of specific scheduling requirements. The bulk of missions will be daily out and back or single overnight trips anywhere in North America.

The normal hours of operation may be extended, if required, for weekdays mornings (from 0600 and 0800 hours), for weekday evenings (from 1600 and 2000 hours), and for night vision training possibly until 2300 hrs, depending upon the time of year.

The contractor shall be responsible for all maintenance required to service, inspect and rectify any aircraft malfunction while the aircraft is being operated by AETE crew both at the AETE operating base or any other airport at which the aircraft may be located. The contractor must be experienced and competent in the control of maintenance of an aircraft fleet, and must either be registered as a private operator under Canadian Aviation Regulation 604 or hold an Air Operator Certificate issued by Transport Canada Civil Aviation in accordance with Canadian Aviation Regulations Part VII.

The daily minimum servicing/maintenance requirement is for a Daily Inspection and whatever maintenance is due on the aircraft in accordance with an approved maintenance schedule. There is no requirement to have an Aircraft Maintenance Engineer on-site 24 hours 7 days per week; however, it is expected that, barring unforeseen circumstances, a maintenance presence will be on-site during regular local business hours (0800-1600 Monday to Friday). Outside of these requirements an on-call posture can be assumed. The overriding requirement is that aircraft meet their mission departure times.

The contractor will be required to provide Daily Inspection training and authorization for all Royal Canadian Air Force pilots involved in the operation.

If AETE is located on a Canadian Forces base, DND will provide hangar space or storage area for tools, spare parts and working space for contractor support personnel.

Maintenance shall be performed by a Transport Canada Approved Maintenance Organization and by technicians holding valid Canadian Aircraft Maintenance Engineers licenses.

The aircraft shall be in a configuration which complies with the aircraft type approval.

DND will provide petroleum, but the contractor is responsible for the provision of oil and lubrication products. The contractor shall provide any required aircraft-specific maintenance support equipment, including towing vehicle. The contractor must provide sufficient personnel for the following basic servicing activities: towing, parking, refuelling and washing the aircraft.

On missions away from the AETE location, DND will pay military personnel travel and aircraft fuel expenses but aircraft handling costs, including but not limited to landing, hangarage and navigation service fees, and any on the road maintenance costs (including aircraft recovery) will be paid by the contractor. The contractor may want to consider a mobile repair capability.

If an aircraft becomes unserviceable, a replacement aircraft shall be provided within 3 working hours, when the aircraft is located at the AETE location and within one day when the aircraft is away from the AETE location.

#### ***4.4 Proficiency Aircraft Essential Requirements***

The following aircraft characteristics are considered essential to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Respondents are requested to identify aircraft that would meet these requirements as well as budgetary cost estimates for provision of these aircraft based on a 3-5 year lease period:

1. Modern light to medium twin turbine aircraft, propeller or jet.
2. Retractable landing gear system, capable of multiple extensions and retractions for continuous operations in the circuit.
3. Landing gear that is able to withstand repeated 600 foot per minute descent rates such as would be experienced in a training environment.
4. Seating for two pilots plus at least one additional test crew with intercom access.
5. Certified for all weather, day and night operations.
6. Single pilot certified, at minimum for Visual Flight Rules.
7. Certified for Operations in Icing Conditions.
8. Certified for Ground De-Icing Operations (w/ Type II, III or IV (or equivalent) anti-/de-icing fluids).
9. Capable of conducting self-contained engine starts without the requirement for ground based equipment.
10. Airspeed of at least 250 Knots Indicated Air Speed below 10,000 feet Mean Sea Level, 300 Knots True Air Speed above 10,000 feet Mean Sea Level.
11. Pressurized Cabin.
12. Operations up to 25,000 feet Mean Sea Level.
13. Endurance at 10,000 feet Mean Sea Level of at least 3 hrs.
14. Capable of maintaining at least 15,000 feet Mean Sea Level on a single engine.

Attachment 3 to  
EFTR Request for Information

15. Equipped with a heating and ventilation system suited to maintain the cockpit and cabin temperature such that the environment is comfortable and controllable within a range +5 to +25 degrees Celsius.
16. Capable of 0 to 2.5 g.
17. Capable of up to 60° Angle Of Bank.
18. Capable of performing single engine approaches, landings, and overshoots.
19. Capable of landing with a 25 knot crosswind component.
20. Electromechanical actuated trim system for pitch.
21. Pedal mounted toe brakes.
22. Means for the crew to read Outside Air Temperature.
23. Stand-alone clock system that is independent of the navigation and communication system.
24. Autopilot (Multiple axes, with Flight Director).
25. Instrument Flight Rules certified (to at least CAT I minima).
26. Navigation:
  - a. En-Route: Area Navigation 1 / Required Navigation Performance 1.
  - b. Approach: Lateral Navigation only and Lateral Navigation/Vertical Navigation
27. Glass cockpit (Electronic Attitude and Horizontal Situational Indicators / Displays).
28. Traffic Collision Avoidance System.
29. Instrument Landing System / Very High Frequency Omni Directional Radio Range / Distance Measuring Equipment.
30. Dual-Very High Frequency Communications.
31. Voice activated intercom system that will allow in-cockpit communication between the pilots and the other crew stations.
32. Emergency oxygen (quick don style) and eye protection system for the two pilots and a third occupant that is compatible with the headset.
33. Parking brake.
34. Warning/caution system to monitor flight critical systems.
35. Flight Data Recorder and Cockpit Voice Recorder.
36. First aid kit.
37. Fire detection and extinguishing system for each engine.

These essential requirements will become the core mandatory requirements in any subsequent Request(s) for Proposal that may be issued, although other mandatory requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these essential criteria is invited.

#### ***4.5 Proficiency Aircraft Desirable Characteristics***

The following aircraft characteristics are considered desirable to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Contractors are encouraged to propose aircraft for consideration that meet the following criteria:

1. Additional cabin seating with intercom access for test crew.
2. Capable of -1 to 3g.
3. The aircraft stall characteristics allow for unrestricted flight in the stall buffet regime or with full aft input of the longitudinal control system.
4. Databus access.
5. Capability to transmit flight test-like data in real time to practice remote flight test data gathering.
6. Ultra High Frequency radio.
7. Weather radar.
8. Night Vision Goggle compatibility.
9. Additional mission systems (eg radar, Electro-Optics/Infra-Red).
10. Ground Collision Avoidance System.
11. Full Authority Digital Engine Control.
12. Digital Map Display / Moving Map Capability.
13. Automatic Dependent Surveillance-B.
14. Datalink Communications.
15. Reduced Vertical Separation Minimum Certified.
16. Instrument Flight Rules Certified to CAT II (or better).
17. Required Navigation Performance Authorization Required Approaches / Localizer Performance with Vertical Guidance approach certified.
18. Wide Area Augmentation System / Satellite-Based Augmentation System capable.
19. Satellite Communications.
20. Electronic Flight Instrumentation System.

These desirable requirements will become the rated requirements in any subsequent Request(s) for Proposal that may be issued, although other desirable requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these desirable criteria is invited.

## **EFTR WORK PACKAGE FOR: Fast Jet Proficiency Flying**

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### **REFERENCE:**

TC & DND MOU – Airworthiness Oversight of Civilian Air Operators and Aircraft Contracted to Conduct Military Missions for DND, DND ID No 2004072851, (TCCA) RDIMS 5200-43 (RDIMS # AEPM 412957).

## **1 INTRODUCTION**

Engineering Flight Test Rationalization is a specific activity under the Defence Renewal. The lead for Engineering Flight Test Rationalization is Assistant Deputy Minister (Materiel), Director General Aerospace Equipment Program Management. Engineering Test and Evaluation services are delivered to the Assistant Deputy Minister (Materiel) organization by the Aerospace Engineering Test Establishment (AETE), a lodger unit located at 4 Wing Cold Lake, Alberta. The Commanding Officer AETE reports to the Director General Aerospace Equipment Program Management.

Defence Renewal is organized under two main Renewal Actions: Performance and Organizational Practices. The Sustainment Initiative (also commonly referred to as Maintenance Program Design) falls under Performance Renewal and specifically under the theme “Maintenance and Materiel”. The Sustainment Initiative will focus on achieving renewal to maintenance programs and sustainment procurement, as well as other sustainment efficiencies.

The Sustainment Initiative consists of four main activities:

- In-Service Support Procurement;
- Maintenance Program Rationalization;
- Professional Development; and
- Engineering Flight Test Rationalization.

This document addresses the Engineering Flight Test Rationalization element of the Sustainment Initiative. The goal of the Engineering Flight Test Rationalization initiative is to increase efficiency in the delivery of aerospace engineering test and evaluation capabilities in order to reduce the costs of operations, release military positions and aircraft for higher priority operational deployment and to ensure that engineering test and evaluation service delivery is sustainable over the longer term.

Engineering flight test and evaluation services are required by the Canadian Armed Forces to ensure the airworthiness of aircraft and aircraft systems. AETE has been delivering these critical support services to DND Weapon System Management organizations and Major Capital Project Management Offices since the unit was re-located to Alberta in 1971 from Ottawa.

## **2 PURPOSE**

The objectives of this document are:

5. To provide sufficient background information so that industry can understand the objectives of the program in order to determine their interest in participating in the Engineering Flight Test Rationalization initiative and in what manner; and
6. To continue industrial engagement in order for Canada and Industry to understand and formulate strategies whereby industry may effectively support Engineering Flight Test Rationalization objectives in a mutually beneficial manner.

## **3 SCOPE**

### ***3.1 Engineering Flight Test Rationalization Scope***

The scope of the Engineering Flight Test Rationalization initiative includes:

7. Capability Rationalization. Some capabilities currently existing at AETE may not be totally relevant in today's test and evaluation. Such capability could be divested entirely providing immediate savings in both personnel and cost.
8. Location. The existing location of AETE in Cold Lake provides easy access to a large restricted airspace and evaluation ranges. The remoteness of Cold Lake may however preclude the sharing of resources, both in terms of personnel and facilities, with other government departments and agencies as well as potentially limit industry interactions. The review of an alternate location is considered necessary to analyze all possible options.



9. Outsourcing. Outsourcing will be analyzed thoroughly in consideration of similar initiatives implemented by Canada's allies and in full recognition of Canadian industrial capabilities. There is the intent to retain a distinguishable DND in-house test and evaluation capability in order to maintain a smart-buyer capability both for flight test services and for new aerospace platform and system deployment. Outsourcing options will include consideration of innovative business models including such constructs as Public-Private partnerships.

### **3.2 Work Package Scope**

This work package addresses the Fast Jet Proficiency Flying requirements for the Engineering Flight Test Rationalization Project.

Proficiency flying operations ensure that AETE flight test personnel can effectively plan, conduct and report on flight and ground test operations. Proficiency flying operations support the performance assurance for Qualified Test Pilots, Flight Test Engineers and Qualified Systems Evaluators. Proficiency flying hours are, however, based on the minimum requirements for Qualified Test Pilot currency as specified by the Royal Canadian Air Force.

It is stressed that proficiency flying does not include project support flying and is conducted within the approved flight envelope of the aircraft.

This Request for Information is seeking novel ways of achieving proficiency flying requirements for AETE flight test crews. Flying hour requirements, as well as essential and desirable aircraft capabilities, are specified in Section 4 of this work package and industry is invited to propose methods of satisfying these requirements for consideration by DND as well as alternate means for ensuring optimal flight test crew efficiency.

## **4 REQUIREMENTS**

### **4.1 General**

DND requires the provision of flying hours to satisfy AETE Fast Jet instrument and visual proficiency flying requirements as further detailed hereunder. Flying hours must be provided at the airfield where AETE is located (which may be in a new location) in accordance with the initial requirements identified in this Request for Information and as further specified in any subsequent Request(s) for Proposal that may be issued. The tasking and scheduling of the provision of flying hours will be controlled by DND. The proficiency missions will be flown on any day of the week (including weekends) at any time of day and night under Visual Flight Rules and Instrument Flight Rules, together with a requirement to conduct both precision and non-precision approaches.

The proficiency missions will be flown in accordance with DND Flying Orders and procedures. Technical airworthiness of the aircraft will remain under the oversight of Transport Canada Civil Aviation. However, civil aircraft conducting military missions for DND are classed as military aircraft in accordance with the Aeronautics Act and Ministerial delegations to the DND Operational, Technical and Investigative Airworthiness Authorities; therefore, DND will also exercise airworthiness oversight in accordance with Reference and the Contractor must support DND airworthiness audits at Contractor and DND facilities. Audits will address airworthiness



documentation such as, but not limited to, maintenance records, quality control procedures, component history data and log books.

Projected base and surge flying hours and availability requirements are specified in section 4.2 of this Request for Information.

The contractor will be required to provide all maintenance, servicing and logistics support as specified in section 4.3 of this Request for Information.

The essential and desirable characteristics of suitable aircraft are specified in section 4.4 and 4.5 of this Request for Information.

AETE pilots who have achieved DND wings standard (or DND-recognized equivalency from other nations) and successfully completed initial type conversion training recognized by the contractor will act as Pilot-In-Command of all proficiency flights.

All flights in proposed aircraft may also have an AETE pilot or non-pilot aircrew occupying the second aircraft seat. The non-pilot aircrew will typically be a Flight Test Engineer or Qualified Systems Engineer. Other personnel, military and/or civilian, may be authorized by AETE to fly in the proposed aircraft as a passenger or technical crew member.

Once qualified on type, DND will fly the aircraft without contractor pilots in the aircraft.

Proposed aircraft must meet all applicable airworthiness, legal and insurance requirements and standards stipulated in Transport Canada Canadian Air Regulations for a commercial rental aircraft.

Proposed aircraft should be available for Canada / continental United States cross country training, including overnight stops without a contractor technical crew member (Aircraft Maintenance Engineer support).

## ***4.2 Aircraft Flying Hour Requirements***

DND is exploring options for meeting proficiency flying requirements. Project flying that is performed in DND aircraft contributes to the achievement of minimum proficiency flying requirements. At this point in the options analysis, the minimum and maximum yearly flying hours required are as follows:

11. Minimum 240 flying hours per year,
12. Maximum 400 flying hours per year,
13. Quarterly and monthly hours may be assumed to be the above figures, divided by 4 or 12 as applicable, and
14. Daily availability is to be specified by the contractor in accordance with the above flying hour requirements, but is to ensure that the maximum schedule flexibility can be provided.
15. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. The bulk of missions will be daily out and back or single overnight trips anywhere in North America. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity.

### ***4.3 Maintenance and Servicing Requirements***

The contractor shall be responsible to provide sufficient aircraft to support the usage for DND proficiency requirements at the AETE location. The total number of flying hours will be spread throughout the contract year with an expected reduction in usage during the months of July, August and December. Minor changes to task requirements may be necessary as a result of weather conditions or small changes to the flying programme. As well, typical usage (excluding cross-country or night flying) will normally occur between the hours of 0800 and 1600 hours on working days (a day that is not a weekend, a designated holiday). The Contractor will be given as much notice as possible for any significant schedule changes that may affect aircraft availability or maintenance activity. DND will provide 3 working days notice of specific scheduling requirements. The bulk of missions will be daily out and back or single overnight trips anywhere in North America.

The normal hours of operation may be extended, if required, for weekdays mornings (from 0600 and 0800 hours), for weekday evenings (from 1600 and 2000 hours), and for night vision training possibly until 2300 hrs, depending upon the time of year.

The contractor shall be responsible for all maintenance required to service, inspect and rectify any aircraft malfunction while the aircraft is being operated by AETE crew both at the AETE operating base or any other airport at which the aircraft may be located. The contractor must be experienced and competent in the control of maintenance of an aircraft fleet, and must either be registered as a private operator under Canadian Aviation Regulation 604 or hold an Air Operator Certificate issued by Transport Canada Civil Aviation in accordance with Canadian Aviation Regulations Part VII.

The daily minimum servicing/maintenance requirement is for a Daily Inspection and whatever maintenance is due on the aircraft in accordance with an approved maintenance schedule. There is no requirement to have an Aircraft Maintenance Engineer on-site 24 hours 7 days per week; however, it is expected that, barring unforeseen circumstances, a maintenance presence will be on-site during regular local business hours (0800-1600 Monday to Friday). Outside of these requirements an on-call posture can be assumed. The overriding requirement is that aircraft meet their mission departure times.

The contractor will be required to provide Daily Inspection training and authorization for all Royal Canadian Air Force pilots involved in the operation.

If AETE is located on a Canadian Forces base, DND will provide hangar space or storage area for tools, spare parts and working space for contractor support personnel.

Maintenance shall be performed by a Transport Canada Approved Maintenance Organization and by technicians holding valid Canadian Aircraft Maintenance Engineers licenses.

The aircraft shall be in a configuration which complies with the aircraft type approval.

DND will provide petroleum, but the contractor is responsible for the provision of oil and lubrication products. The contractor shall provide any required aircraft-specific maintenance support equipment, including towing vehicle. The contractor must provide sufficient personnel for the following basic servicing activities: towing, parking, refuelling and washing the aircraft.

On missions away from the AETE location, DND will pay military personnel travel and aircraft fuel expenses but aircraft handling costs, including but not limited to landing, hangarage and navigation service fees, and any on the road maintenance costs (including aircraft recovery) will be paid by the contractor. The contractor may want to consider a mobile repair capability.

If an aircraft becomes unserviceable, a replacement aircraft shall be provided within 3 working hours, when the aircraft is located at the AETE location and within one day when the aircraft is away from the AETE location.

#### ***4.4 Proficiency Aircraft Essential Requirements***

The following aircraft characteristics are considered essential to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Respondents are requested to identify aircraft that would meet these requirements as well as budgetary cost estimates for provision of these aircraft based on a 3-5 year lease period:

1. Modern tandem ejection seat equipped military pattern jet aircraft;
2. Both seats must accommodate personnel of an anthropomorphic range equivalent to that applicable to the CT-155 Hawk aircraft.
3. Capable of flying at speeds broadly representative of the CF-188 Hornet (although supersonic capability is not required).
4. Single pilot Instrument Flight Rules approved.
5. Ultra High Frequency and Very High Frequency radios.
6. Approved for Global Positioning System approaches.
7. Multi-Function Display with Moving Map display.
8. Equipped for operation from rear seat by a DND aircraft commander.

These essential requirements will become the core mandatory requirements in any subsequent Request(s) for Proposal that may be issued, although other mandatory requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these essential criteria is invited.

#### ***4.5 Proficiency Aircraft Desirable Characteristics***

The following aircraft characteristics are considered desirable to ensure that the aircraft used to provide the flying hours are suitable for AETE flight test proficiency. Contractors are encouraged to propose aircraft for consideration that meet the following criteria:

1. Both seats must accommodate personnel of an anthropomorphic range equivalent to that applicable to the CF-188 aircraft;
2. Autopilot;

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3. Glass cockpit;
4. Heads Up Display;
5. Air Intercept radar or simulated radar capability;
6. Night Vision Goggle compatibility;
7. Additional mission systems (eg Radar, Electro-Optic/InfraRed);
8. Self-starting capability;
9. Databus access; and
10. Capability to transmit flight test-like data in real time to practice remote flight test data gathering.

These desirable requirements will become the rated requirements in any subsequent Request(s) for Proposal that may be issued, although other desirable requirements may be identified as part of, or subsequent to, this Request for Information process. Contractor feedback on these desirable criteria is invited.

## **EFTR WORK PACKAGE FOR: Engineering Support**

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## **1 INTRODUCTION**

Engineering Flight Test Rationalization is a specific activity under the Defence Renewal. The lead for Engineering Flight Test Rationalization is Assistant Deputy Minister (Materiel), Director General Aerospace Equipment Program Management. Engineering Test and Evaluation services are delivered to the Assistant Deputy Minister (Materiel) organization by the Aerospace Engineering Test Establishment (AETE), a lodger unit located at 4 Wing Cold Lake, Alberta. The Commanding Officer AETE reports to the Director General Aerospace Equipment Program Management.

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The Sustainment Initiative consists of four main activities:

- In-Service Support Procurement;
- Maintenance Program Rationalization;
- Professional Development; and
- Engineering Flight Test Rationalization.

This document addresses the Engineering Flight Test Rationalization element of the Sustainment Initiative. The goal of the Engineering Flight Test Rationalization initiative is to increase efficiency in the delivery of aerospace engineering test and evaluation capabilities in order to

reduce the costs of operations, release military positions and aircraft for higher priority operational deployment and to ensure that engineering test and evaluation service delivery is sustainable over the longer term.

Engineering flight test and evaluation services are required by the Canadian Armed Forces to ensure the airworthiness of aircraft and aircraft systems. AETE has been delivering these critical support services to DND Weapon System Management organizations and Major Capital Project Management Offices since the unit was re-located to Alberta in 1971 from Ottawa.

## **2 PURPOSE**

The objectives of this document are:

7. To provide sufficient background information so that industry can understand the objectives of the program in order to determine their interest in participating in the Engineering Flight Test Rationalization initiative and in what manner; and
8. To continue industrial engagement in order for Canada and Industry to understand and formulate strategies whereby industry may effectively support Engineering Flight Test Rationalization objectives in a mutually beneficial manner.

## **3 SCOPE**

### ***3.1 EFTR Scope***

The scope of the Engineering Flight Test Rationalization initiative includes:

10. Capability Rationalization. Some capabilities currently existing at AETE may not be totally relevant in today's test and evaluation. Such capability could be divested entirely providing immediate savings in both personnel and cost.
11. Location. The existing location of AETE in Cold Lake provides easy access to a large restricted airspace and evaluation ranges. The remoteness of Cold Lake may however preclude the sharing of resources, both in terms of personnel and facilities, with other government departments and agencies as well as potentially limit industry interactions. The review of an alternate location is considered necessary to analyze all possible options.
12. Outsourcing. Outsourcing will be analyzed thoroughly in consideration of similar initiatives implemented by Canada's allies and in full recognition of Canadian industrial capabilities. There is the intent to retain a distinguishable DND in-house test and evaluation capability in order to maintain a smart-buyer capability both for flight test services and for new aerospace platform and system deployment. Outsourcing options will include consideration of innovative business models including such constructs as Public-Private partnerships.

This Request for Information and its work packages identify the non-core functions and resources that are being considered for outsourcing and/or rationalization.

## **4 REQUIREMENTS**

Engineering Support consists of all engineering and data processing activities which generate, collate, analyze and summarize the data acquired through the conduct of the various flight test projects. This includes temporarily modifying aircraft to accept flight test instrumentation and all associated work. It also includes the processing and storage of the data into a format from which airworthiness decisions and conclusions can be made.

DND is seeking cost effective innovative solutions employing industry best practices. The current AETE organizational structure and/or location should not be considered as a constraint in developing proposals. The flight test environment within DND is directly affected by geopolitical realities and therefore AETE must be capable of rapidly surging when urgent operational priorities are identified. DND envisages the provision of a baseline level of effort sufficient to meet the steady state project requirements, with an option for additional capacity to address increments in work related to operational tempo (surge capacity). Industry will be required to work in a collaborative team environment with DND flight testing and project staff.

Ideally, DND would like to see the development of a set of standard instrumentation suites to port standard low cost solutions to multiple DND platforms and/or develop a multi-purpose platform for various uses. DND desires commonality as much as possible and strives to reduce the amount of unique designs for each test.

Note: Aircraft maintenance activities are not in-scope of this request for information work package. Flight test instrumentation modifications must be reversible and must not affect the aircraft Basis of Certification. These modifications are typically embodied on aircraft in conjunction and partnership with Military qualified technical maintenance staff.

### ***4.1 Types of Work and Level of Effort Estimates***

DND has personnel who carry out engineering support functions. These include electrical/signal processing, structural, Electro-Magnetic Interference / Electro-Magnetic Compatibility, and instrumentation engineers, as well as design/avionics technologists, avionics technicians, general shop support (mechanical fabrication and electrical support) and software programmers.

The contractor will be required to provide engineering support to AETE in the conduct of various types of projects that can be loosely grouped into the following:

- a. Flight test projects requiring instrumentation;
- b. Flight test projects requiring data collection and processing; and
- c. Instrumentation technology development projects to improve efficiency of the general flight test capability.

In addition, a project may encompass all of the above types of support or a combination. In order to provide industry with a better understanding of the delivery requirements, examples of each of these types of projects are provided as attachments to this Request for Information.

### ***4.2 Requirements Scope***

The contractor will be required to:

Attachment 5 to  
EFTR Request for Information

- a) Propose a facility that is located at same airport or geographical area as AETE or co-located with AETE which will support the delivery of Engineering Support Services to the various projects;
- b) Procure, design, document, build, and install flight test instrumentation including all required aircraft modifications in support of installation of the instrumentation packages (approve, design, draw build de-modification);
- c) Develop and conduct flight test instrumentation functional ground tests including pre and post flight functional and or checks;
- d) Conduct the work at military bases, operating locations and on ships at Sea;
- e) Provide environmental testing services such as but not limited to mass properties, vibration and environmental and night vision imaging system ground testing, thermal testing, noise testing;
- f) Provide a secure environment in which to process classified data requirements at a Top Secret level (Level III);
- g) Demonstrate experience with aircraft, avionics, and structural modifications where favourable consideration will be given to experience on DND aircraft types.
- h) Manage the instrumentation suite(s), systems, software and data to address configuration and obsolescence with an integrated logistics support approach;
- i) Develop data processing plans, including imaging data in accordance with the various project requirements and conduct data acquisition, processing, and storage in accordance with DND security regulations.

**4.2.1 Policies and Standards Compliance**

- Eligible to become an Accredited DND Design Organization
- Eligible to become an Accredited DND Technical Organization
- Eligible to become an Accredited DND Manufacturing Organization



## **EFTR WORK PACKAGE FOR: Flight Test Support**

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10. To continue industrial engagement in order for Canada and Industry to understand and formulate strategies whereby industry may effectively support Engineering Flight Test Rationalization objectives in a mutually beneficial manner.

## **3 SCOPE**

The scope of the Engineering Flight Test Rationalization initiative includes:

13. Capability Rationalization. Some capabilities currently existing at AETE may not be totally relevant in today's test and evaluation. Such capability could be divested entirely providing immediate savings in both personnel and cost.
14. Location. The existing location of AETE in Cold Lake provides easy access to a large restricted airspace and evaluation ranges. The remoteness of Cold Lake may however preclude the sharing of resources, both in terms of personnel and facilities, with other government departments and agencies as well as potentially limit industry interactions. The review of an alternate location is considered necessary to analyze all possible options.
15. Outsourcing. Outsourcing will be analyzed thoroughly in consideration of similar initiatives implemented by Canada's allies and in full recognition of Canadian industrial capabilities. There is the intent to retain a distinguishable DND in-house test and evaluation capability in order to maintain a smart-buyer capability both for flight test services and for new aerospace platform and system deployment. Outsourcing options will include consideration of innovative business models including such constructs as Public-Private partnerships.

This Request for Information and its work packages identify the non-core functions and resources that are being considered for outsourcing and/or rationalization.

## **4 REQUIREMENTS**

Test Support consists of all engineering and technical support required during the conduct of the flight test. This includes ground target set-up, monitoring of the test flight and data capturing.

DND is seeking cost effective innovative solutions employing industry best practices. The current organizational structure, infrastructure, equipment or location should not be considered as a constraint in developing proposals.

The flight test environment within DND is directly affected by geopolitical realities and therefore AETE must be capable of rapidly surging when urgent operational priorities are identified. DND envisages the provision of a baseline level of effort sufficient to meet the steady state project requirements, with an option for additional capacity to address increments in work related to operational tempo (surge capacity). Industry will be required to work in a collaborative team environment with DND flight testing and project staff. DND requires common, portable, and innovative low cost solution proposals for testing. DND desires commonality as much as possible and strives to reduce the amount of unique setup and development for each test.

Flight testing is conducted in airspace that is dependent on the type of testing required. It can be accomplished in uncongested or military managed airspace. Certain missions which require live or inert weapons (including gun fire) or electronic warfare testing will be conducted at licensed Military Ranges in Canada and on occasion in the United States. Industry will not be required to provide test support to DND as defined above outside of Canada.

The services currently provided by the AETE Operations section are out of scope of this requirement. This includes approving, coordinating and supervising all local daily flying operations, coordination of AETE airspace, range, airfield, aircraft fuel, and other requirements with 4 Wing and provision of meteorological support. Contractors may propose alternate solutions for provision for some or all of these services at any alternate location.

#### ***4.1 Types of Work and Level of Effort Estimates***

DND (both AETE and 4 Wing) has personnel who carry out flight test support functions. AETE conducts several different types of test flights which range from no test specific ground support being required to high levels of aircraft to ground monitoring and coordination. The broad types of ground support required during the flight testing phase are:

- a. Time and Space Position Information gathering ;
- b. Flight test coordination - receiving and processing real-time data to allow for in-flight test control decisions; and
- c. Ground test support – target design, procurement, maintenance and set up.

While these types of ground support are not required for every project, and some are used infrequently, AETE needs to maintain the capability to provide these types of support, when required, in a prompt and cost effective manner that meets the operational tempo and requirements. DND is open to innovative solutions in the provision of these capabilities.

Proposals should include any Government Furnished Equipment deemed necessary by industry (eg Link 16 ground stations).

Examples of projects involving each of these types of support are provided as attachments to this Request for Information in order to provide industry with a better understanding of the delivery requirements. In addition, a project may require all of the above types of support or a combination.

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## **AEROSPACE ENGINEERING TEST ESTABLISHMENT**

The Engineering Flight Test Capability of the Canadian Armed Forces

April 2015

Attachment 7 to  
EFTR Request for Information

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## **1 INTRODUCTION**

1. The Department of National Defence requires an independent and impartial organization to provide flight and technical evaluation of aircraft and aerospace equipment for the Canadian Armed Forces. The organization that provides this capability to the Canadian Armed Forces is the Aerospace Engineering Test Establishment in Cold Lake, Alberta. The Aerospace Engineering Test Establishment organization provides flexible aerospace test and evaluation expertise and services in support of the Canadian Armed Force's operational capabilities. It possesses a broad spectrum of engineering expertise in order to perform many different types of tests, from investigating design assumptions in prototype installations to assessing a contender aircraft's suitability to accomplish a specific role.

## **2 AIM**

2. The aim of this document is to describe the mission, organization and capabilities of the Aerospace Engineering Test Establishment.

## **3 MISSION**

3. The mission of the Aerospace Engineering Test Establishment is to provide aerospace test and evaluation expertise and services in support of the Royal Canadian Air Force's operational capabilities. The Aerospace Engineering Test Establishment is an Assistant Deputy Minister (Materiel) field unit directly responsible to Director General Aerospace Equipment Program Management.

4. The Aerospace Engineering Test Establishment must be capable of conducting a broad range of ground and flight testing on aircraft and aircraft systems, and sufficiently flexible to respond to rapid changing priorities and, when required, to meet wartime demands. This sometimes includes deploying to austere locations to conduct testing. The scope of testing is technically diverse and could include such tests as weapons system software modifications, stores certification, avionics certification, unmanned aerial vehicle testing, escape systems testing (i.e. aircraft life support equipment and ejection seats), synthetic flight training device certification, ship/helicopter operating limits and flutter testing.

## **4 FACILITIES**

5. The Aerospace Engineering Test Establishment is a lodger unit at 4 Wing, Cold Lake, Alberta, Canada, the largest fighter base in the Royal Canadian Air Force. As a lodger unit, the Aerospace Engineering Test Establishment receives administrative, technical and logistics support from 4 Wing. The Wing owns and maintains all fixed infrastructure used by the Aerospace Engineering Test Establishment. 4 Wing is responsible for airfield operations and provides full visual flight rules and instrument flight rules services for military aircraft 24 hours a day. There are two main parallel runways at 4 Wing measuring 12,500 x 200 feet and 10,000 x 150 feet. A cross runway measuring 8,300 x 200 feet is also in operation. The runways are

capable of handling all types of aircraft from advanced fighter jets to heavy transport aircraft (Boeing 747, C-17 Globemaster, C-5 Galaxy class aircraft). Arresting gear is available for both approach and departure ends on all three runways. Instrument approach systems include Non-Directional Beacon, Tactical Air Navigation, Instrument Landing System and Precision Approach Radar. 4 Wing is also licensed to store and assemble a wide variety of explosive ordnance.

6. 4 Wing maintains and operates the Cold Lake Air Weapons Range which is located 25 nautical miles north of the base. One of the largest ranges in the world, its foot print, from surface-to-infinity, measures 98 nautical miles long by 35 nautical miles wide and it contains several ground target complexes for inert bombing training and testing. The Cold Lake Air Weapons Range encompasses the Primrose Lake Evaluation Range, the Jimmy Lake Range and the Shaver River Range. The Jimmy Lake Range and Shaver River Range are operated by 4 Wing, and the Primrose Lake Evaluation Range is primarily operated by the Aerospace Engineering Test Establishment. Both the Jimmy Lake Range and Shaver River Range are licensed for live weapons up to 2,000 pound general purpose bombs, air-to-ground missile/rocket firings and for gun firings. Licences to drop live, newer generation, laser and Global Positioning System precision guided bombs on certain targets in the Cold Lake Air Weapons Range have been issued on a case by case basis. The Cold Lake Air Weapons Range also includes supersonic corridors and low flying areas.

7. The Primrose Lake Evaluation Range contains three drop zones; drop zones ALPHA and BRAVO are on land and are used for air-to-ground operations including live weapons such as rockets and general purpose bombs, and drop zone CHARLIE is a water zone used for weapons delivery in both winter and summer. The use of water allows easy assessment of the performance of unique stores such as dispenser or cluster munitions. A ground firing rack provides the ability to conduct static rocket firing onto the lake surface. All three zones are visible by the Time Space Position Information System. In addition, impact point scoring is also available.

8. The Aerospace Engineering Test Establishment resides in the Janus Zurkowski Building (7 Hangar) which provides office, laboratory, workshop and aircraft storage and servicing facilities. The building also contains a test bay capable of handling aircraft as large as CC130 Hercules and CP140 Aurora. The test bay contains reinforced floor anchors to permit aircraft structural testing and loads applications and is temperature controlled to permit calibration of sensitive instrumentation any time of the year. The test bay can also be blacked out and sealed from external light so that visual performance of lighting systems as well as night vision goggle compatibility evaluations can be done using its night sky simulator.

## **5 ORGANIZATION**

9. The Aerospace Engineering Test Establishment is divided into a Command and Control group and four Branches: Evaluation, Evaluation Support, Logistics (which includes financial administration, training and human resources) and Safety. The unit manages, on average, 30 projects of various complexities at any given time and releases approximately 20 reports and technical notes per year. Many projects involve deployment to Royal Canadian Air Force Wings

across Canada or to original equipment manufacturer facilities all over the world. Recent projects have involved deployments to austere locations such as Resolute Bay and Alert, NWT; Kandahar, Afghanistan; and onboard a Royal Canadian Navy frigate in the North Atlantic Ocean.

### **5.1 COMMAND AND CONTROL**

10. The Command and Control group, comprising the Commanding Officer, Unit Chief Warrant Officer and a small cadre of senior personnel, is responsible for the day-to-day operation and management of all activities at the unit. Specific responsibilities include final acceptance authority of new projects, release authority for project estimates and test reports, release authority for contractual and financial reports and responsibility for the quality of all work and deliverables, organizational efficiency and discipline, and safety.

### **5.2 EVALUATION BRANCH**

11. The Evaluation Branch has 54 positions, including the Senior Test Pilot, and is divided into seven sections: Multiengine Evaluation; Fighter/Trainer Evaluation; Rotary Wing Evaluation; Avionics/Crew Systems Evaluation; Aerospace Engineering Test Establishment Detachment Trenton; Operations; and Project Control.

#### **5.2.1 Evaluation Sections**

12. The Multiengine Evaluation, Fighter/Trainer Evaluation, Rotary Wing Evaluation, and Aerospace Engineering Test Establishment Detachment Trenton sections consist of Qualified Test Pilots, Flight Test Engineers, Qualified Systems Evaluators, as well as specialist support engineers.

13. Most of the 14 Qualified Test Pilots and nine Flight Test Engineers are employed in these sections, and all are graduates of either the National Test Pilot School, Empire Test Pilot School, International Test Pilots School, United States Navy Test Pilot School, United States Air Force Test Pilot School, or the École du personnel navigant d'essais et de reception. Qualified Test Pilots and Flight Test Engineers are qualified to evaluate performance, stability, control, captive carriage, stores clearance, flutter, and more on new, modified, repaired, and overhauled multi-engine, fighter, trainer and rotary wing aircraft, unmanned aerial vehicles and flight simulators. They also have the expertise to evaluate avionics and mission systems.

14. Most of the Qualified Systems Evaluators are also employed in the Evaluation sections. Qualified Systems Evaluators are Air Combat Systems Operator officers with significant Royal Canadian Air Force operational experience, plus advanced education or training relevant to aerospace systems evaluation. On the systems evaluation projects to which they are assigned, Qualified Systems Evaluators have responsibilities, on the ground and in flight, identical to Flight Test Engineers.

15. The Evaluation branch also has specialist engineers in fields like aeronautical, avionics, electrical, armament, structural, mechanical, propulsion, imaging, human factors, or systems engineering. The specialist engineers can lead certain ground-based test projects, and they



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provide specialist support to project officers for flight test projects. Specific backgrounds and responsibilities of the specialist engineers include the following:

- a. Armament Systems Engineers: Engineers with applicable graduate and post-graduate degrees to provide support to aircraft stores/weapons clearance projects such as:
  - (1) Fit and function;
  - (2) Measurement of mass properties;
  - (3) Development and verification of load checklists;
  - (4) Safe carriage;
  - (5) Separation/jettison;
  - (6) Ballistics and stores flutter testing;
  - (7) Weapons system accuracy testing;
  - (8) Development of weapon safety templates; and
  - (9) Expansion of store/weapon clearance envelopes.
- b. Aeronautical Engineers: Engineers with graduate and post-graduate degrees to provide support to projects requiring aerodynamic analysis such as:
  - (1) Performance and flying qualities (stability and control);
  - (2) External stores certification;
  - (3) Flutter testing;
  - (4) Structural Clearance testing;
  - (5) Measurement of captive air loads; and
  - (6) Pitot-static system testing.
- c. Mechanical Engineers: Engineers with graduate and post-graduate degrees to provide support to projects require mechanical analysis such as life support equipment (ejection seats, parachutes).
- d. Aircraft Structures Engineers: Engineers with graduate and post-graduate degrees to provide support to projects require structural analysis such as:
  - (1) Static strength and fatigue testing;

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- (2) Ground airframe vibration testing;
- (3) Static and dynamic structural loading in flight;
- (4) Flutter testing; and
- (5) Appliance environmental testing (vibration, shock load, climate).

16. Avionics/ Crew System Evaluation section is composed 16 personnel with varied skill sets. The four Qualified System Evaluators, all of whom are graduates of the Canadian Forces' Aerospace Systems Course and/or engineering graduates with advanced degrees, are supported by an Electromagnetic Compatibility engineer, an Electromagnetic Compatibility technologist and three Aviation Life Support Technicians. Together they evaluate avionics systems, missions systems, and Aviation Life Support Equipment and escape systems.

17. Evaluation personnel continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety, and acquire and develop expertise in project management. The project responsibilities of Evaluation personnel include the following:

- a. As Project Officer, act as the project manager to lead the test team to accomplish project objectives;
- b. Work with support engineers, Flight Test Instrumentation engineers and data engineers to define the data required to answer the questions being posed by the sponsor and Director Technical Airworthiness and Engineering Support in the tasking;
- c. Create the project estimate, test plan, risk assessments and associated test reports;
- d. Assist with the creation of the data acquisition and data reduction plans;
- e. Liaise with applicable Department of National Defence units and external agencies to obtain and schedule all resources required for the ground and flight test;
- f. Prepare for, attend and/or lead project meetings, briefings, presentations, technical review boards and safety review boards;
- g. Create test cards, pre and post mission briefs and post flight reports to ensure all data is recorded;
- h. Lead the test team and execute/direct the flight test plan as a test director (Flight Test Engineer) or test pilot;
- i. Summarize test procedures, conditions, results and collateral observations by drafting, reviewing and approving (according to delegated authority) official

military flight test reports based on the standard seven-part paragraph, which emphasizes military role relation; and

- j. Provide engineering analyses in the form of technical notes as required.

### **5.2.2 Operations**

18. The Operations section comprises 15 positions including aircrew, weather specialists, and range control personnel. The section is responsible for approving, coordinating and supervising all local daily flying operations and all activities in the Primrose Lake Evaluation Range, and coordinates Aerospace Engineering Test Establishment airspace, range, airfield, aircraft fuel, and other requirements with 4 Wing. The Operations section also manages aircrew training and standardization.

### **5.2.3 Project Control**

19. The Project Control Office is responsible for day-to-day project tasking and tracking. The section has four positions, including officers with relevant flight test experience, and maintains a master schedule of all active projects with associated resource allocations and timelines. The Project Control Office coordinates taskings with the Air Force Test and Evaluation Coordination office in Ottawa throughout the life cycle of a project, from initiation through closure

20. The Project Control Office develops and maintains the Aerospace Engineering Test Establishment's Project Management Manual and manages all personnel Engineering Test and Evaluation qualification and authorization files. The Project Control staff also serves as the Commanding Officer's staff for a wide variety of issues and initiatives.

## **5.3 EVALUATION SUPPORT BRANCH**

21. Evaluation Support Branch consists of four sections (Aircraft Maintenance, Data Acquisition and Processing, Technical Services, and Airworthiness and Quality Management), and is the largest branch containing 164 personnel. The three main sections (excluding Airworthiness and Quality Management) are described in more detail in the following paragraphs.

### **5.3.1 Aircraft Maintenance**

22. The Aircraft Maintenance section, which consists of 73 personnel (including technicians from all aircraft trades), is responsible for the servicing, maintenance and repair of the aircraft assigned to the Aerospace Engineering Test Establishment, as well as all Aircraft Life Support Equipment. There are two CF-188 Hornets, five CT-114 Tutors, and two CH-146 Griffon aircraft assigned to the unit for use as project test, safety/photo chase and pilot proficiency platforms. One of the CH-146s and three of the CT-114s are fitted with specialized instrumentation packages that can be used to meet the Aerospace Engineering Test Establishment's mandate. The Aircraft Maintenance section is an Accredited Maintenance Organization, signifying that the unit's Maintenance Policy Manual has undergone detailed audits by the Director of Technical Airworthiness and Engineering Support to ensure all the

maintenance procedures and policies are in compliance with the applicable requirements of the Technical Airworthiness Manual and 1 Canadian Air Division Maintenance Policies.

23. The Aircraft Maintenance section is headed by the Unit Aircraft Maintenance Engineering Officer, who is also responsible for the Foreign Object Damage Prevention Program. First and second line maintenance of the aircraft is the responsibility of the Aircraft Production Officer. First line maintenance activities are closely linked to the day-to-day flying operation and include before and after flight inspections, aircraft starts, parking, and refuelling, in addition to configuration changes and aircraft repairs. Although the Aerospace Engineering Test Establishment does some major inspections for the CH-146 Griffon, the major inspections of the CF-188 Hornets and CT-114 Tutors are conducted by other units. The off aircraft equipment maintenance and shop activities, including the aircraft structural repair shop and the Aircraft Life Support Equipment shop, are the responsibility of the Aircraft Maintenance Support Officer. The Aircraft Maintenance Control and Records Officer is responsible for scheduling aircraft preventive maintenance and inspections and for maintaining the integrity of the aircraft maintenance record sets.

### **5.3.2 Data Acquisition and Processing**

24. The Data Acquisition and Processing section comprises three sub-sections, Flight Test Instrumentation Engineering, Airborne Data Systems lab, and Data Processing Engineering. The Aerospace Engineering Test Establishment is an Accredited Design Organization. Similar to the Accredited Maintenance Organization designation process, the Director of Technical Airworthiness and Engineering Support has audited the Aerospace Engineering Test Establishment's engineering processes involved with the development, design, manufacture and installation of instrumentation for flight test to ensure they all comply with the requirement of the Technical Airworthiness Manual and the 1 Canadian Air Division Maintenance Policies.

25. The heart of the Accredited Design Organization is Flight Test Instrumentation Engineering. This sub-section employs two electrical engineers, four structural engineers and two instrumentation engineers, as well as four design technologists, that design and head up the certification effort for all Flight Test Instrumentation and data acquisition systems required for flight testing. The specific responsibilities of the Flight Test Instrumentation Engineering personnel could include the following:

- a. Flight Test Instrumentation Engineers
  - (1) Work with the Project Officer, data processing engineers and technologists to determine what data will be required to answer the questions posed by the sponsor;
  - (2) Work with the technologists and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
  - (3) As the Project Engineer act as the instrumentation/data project manager and be responsible to ensure the Flight Test Instrumentation design meets the requirements and is completed on time with the allotted resources;

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- (4) Require a detailed knowledge of the Department of National Defence Technical Airworthiness system as well as 1 Canadian Air Division Maintenance Policies;
  - (5) Specify and procure electrical and mechanical parts using the military procurement system;
  - (6) Work with the electrical, instrumentation and mechanical technicians as well as the aircraft technicians to install the data acquisition package on the aircraft;
  - (7) Provide inputs to the processes which make up the Accredited Design Organization;
  - (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety;
  - (9) Acquire and develop expertise in project management; and
  - (10) Maintain the ability to deploy into the field and to sea as required.
- b. Design Technologists (both mechanical and electrical)
- (1) Work with the Flight Test Instrumentation engineers, technologists and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
  - (2) Create both the electrical and mechanical drawings;
  - (3) Specify and procure electrical and mechanical parts using the military procurement system;
  - (4) Work with aircraft structures technicians to modify the mechanical designs as required;
  - (5) Work with the instrumentation technicians and technologists to solve any issues that arise during the Flight Test Instrumentation manufacturing; and
  - (6) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test, and flight test safety.

26. The manufacturing, installation, maintenance and repair of this instrumentation are done by the Airborne Data Systems lab which comprises 14 specialized avionics technicians and four technologists. Airborne Data Systems is an Accredited Design Organization, signifying that their Engineering Process Manual has been audited to ensure it is in compliance with all the

applicable requirements of the Technical Airworthiness Manual and 1 Canadian Air Division Maintenance Policies.

27. The Airborne Data Systems lab also maintains and operates many of the environmental test beds (mass properties, vibration, environmental test chamber) required to meet the environmental certification standards for avionics in addition to specialized equipment to test night vision imaging systems. The specific responsibilities of Airborne Data Systems personnel could include the following:

a. Instrumentation Technicians

- (1) Work with the Flight Test Instrumentation engineers, instrumentation technologists and aircraft technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
- (2) Manufacture and troubleshoot the prototype harnesses and other components for Flight Test Instrumentation installations;
- (3) Obtain and maintain high reliability soldering qualification for the sensor builds;
- (4) Work with the aircraft technicians to install the Flight Test Instrumentation kits on to the aircraft and aircraft components;
- (5) Operate the environmental test equipment;
- (6) Operate various Flight Test Instrumentation pallets and any other test equipment as required;
- (7) Perform integrated logistics system (training, maintenance, sparing, disposal etc.) for manufactured Flight Test Instrumentation and all other system used in test (environmental test equipment, Ground Vibration Test equipment, Night Vision Imaging System lab equipment etc.) to ensure the equipment is maintained, calibrated and ready for testing;
- (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety; and
- (9) Maintain the ability to deploy into the field and to sea as required.

b. Instrumentation Technologists

- (1) Work with the Flight Test Instrumentation engineers, and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;

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- (2) Program the computers that modulate the signals for transmission or storage;
- (3) Maintain and set up the telemetry systems on and off aircraft;
- (4) Maintain and setup the Flight Test Control Room infrastructure;
- (5) Determine the format and program the displays used in the Flight Test Control Room for real-time monitoring;
- (6) Calibrate the Flight Test Instrumentation systems;
- (7) Perform Integrated Logistics Support for all Flight Test Control Room; telemetry and calibration equipment; and
- (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test, and flight test safety.

28. Data reduction, taking raw experimental data and transforming it into data that is useful to engineers and project officers, is done by Data Processing Engineering. This sub-section employs two engineers (Electrical / Signal Processing), two technologists and three technicians. Data Processing Engineering not only assists with the conceptual design of the Flight Test Instrumentation at the start of the project, they also work with the test team during project execution and archive the data when the project is complete. Some of their many tasks include: generate Time Space Position Information from various sources; plot the Time Space Position Information and other information using Microsoft Excel and other custom and proprietary programs; perform statistical analysis to validate data or to provide confidence levels for derived or primary data; perform Numerical analysis (e.g. curve-fitting, differentiation/integration of data) and signal processing. To enable Unmanned Aerial Vehicle testing, facilitate complex aircraft testing and to enhance the safety of higher risk testing the Aerospace Engineering Test Establishment operates a Flight Test Control Room. The Flight Test Control Room is connected via a microwave link to the Primrose Lake Evaluation Range and is configurable to allow the test team to monitor data that is transmitted from the test vehicle. The specific responsibilities of Data Processing Engineering personnel could include the following:

a. Data Processing Engineers

- (1) Work with the Project Officer, Flight Test Instrumentation engineers, technologists and technicians to determine what data will be required to answer the questions posed by the sponsor;
- (2) Create Data Acquisition Plans using the Data Requirements Annex developed by the Project Officer;
- (3) Determine the methodology required for data processing and document it in Data Reduction Plans;



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- (4) Work with the Project Officer and Instrumentation Technologists to determine the format of the displays in the Flight Test Control Room for real-time monitoring as required;
  - (5) Process the recorded raw data to produce engineering information that will be used for graphs, statistics, technical notes, etc. This may require tasks such as the following:
    - (a) Develop computer programs to extract/merge data of interest from various data streams; and
    - (b) Perform numerical modelling and analysis as well as signal processing (filtering and Fast Fourier Transforms);
  - (6) Interpret the post processed engineering data and produce the relevant graphs, statistical analysis etc. that will be used by the Project Officer for inclusion in the final report;
  - (7) Produce technical documentation as required;
  - (8) Using various analytical tools, determine the location of Time Space Position Information System constellation to ensure the most accurate positional data with suitable redundancy;
  - (9) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety;
  - (10) Acquire and develop expertise in project management; and
  - (11) Maintain the ability to deploy into the field and to sea as required.
- b. Data Processing Technologists
- (1) Use the tools created by the data processing engineers to convert the data from its raw modulated form into engineering units;
  - (2) Read and understand Interface Control Documents that define data structures;
  - (3) Use various software tools to extract data of interest from various data streams;
  - (4) Using video processing software to process the Time Space Position Information System video streams to produce Time Space Position Information data streams;
  - (5) Develop, and audit processes to ensure accurate, valid and traceable data;



- (6) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety; and
- (7) Maintain the ability to deploy into the field and to sea as required.

### **5.3.3 Technical Services**

29. The Technical Services section is comprised of 39 personnel and is responsible for the operation, maintenance and Integrated Logistics Support of all non-aircraft related technical infrastructure from the technical library to the Time Space Position Information System. The Technical Services section is divided into three sub-sections; Information Systems, Ground Data Systems and Image Data Systems.

30. The Information Systems sub-section has nine personnel to manage the unit's computer and telecommunications infrastructure, as well as the secure processing facility. The secure processing facility is certified for the processing of classified data up to the SECRET level. Additionally, classified operational briefings and debriefings can be carried out inside the secure processing facility. Specific backgrounds and responsibilities of Information Systems sub-section personnel include the following:

- (1) Provide network administrator management functions;
- (2) Maintenance and Integrated Logistics Support of the desktop computers and network systems;
- (3) Maintenance and Integrated Logistics Support of specialized computer systems;
  - (a) Classified systems;
  - (b) Computer Aided Design Software and Systems;
  - (c) Configuration Management Software for design documents (Technical Notes and drawings);
  - (d) Flight Test Control Room network;
  - (e) Image processing stations used to transform Time Space Position Information system information into Time Space Position information;
  - (f) Custom application programming and software in C, C++ and other languages; and
  - (g) Maintenance of secure processing facility; and
  - (h) Provide telecommunications support both wired and wireless.

31. The Ground Data Systems Lab is comprised of 12 personnel and is responsible for the maintenance of the Time Space Position Information System (optical tracking mounts, bridge work stations, generators, trailers etc.), the Primrose Lake Evaluation Range Tower, meteorology equipment and computers and communications equipment, as well as the telemetry infrastructure at both the Primrose Lake Evaluation Range and the Flight Test Control Room (7 Hangar). Specific backgrounds and responsibilities of Ground Data Systems sub-section personnel include the following:

- (1) Perform Integrated Logistics Support for all ground data systems used for test and supporting of testing (i.e. System, differential Global Positioning System, Flight Test Control Room antenna, microwave links, etc.);
- (2) Install and maintain antennae, radios, microwave links as required;
- (3) Install and maintain range telecommunication systems; and
- (4) Setup and install Time Space Position Information System constellations as required.

32. Image Data Systems Lab is comprised of 17 personnel and is responsible for operational employment of the Time Space Position Information System as well as any other photography (still or video) requirements of the Aerospace Engineering Test Establishment. Specific backgrounds and responsibilities of Image Data Systems sub-section personnel include the following:

- (1) Backseat qualified for jet aircraft and camera use Photo/Safety Chase;
- (2) Qualified egress training for helicopter test missions;
- (3) Operate the thermal imaging cameras, laser spot viewer etc.;
- (4) Assist with test and evaluation of new cameras introduced for use in the Royal Canadian Air Force to ensure flight compatibility and safe use in all Royal Canadian Air Force aircraft;
- (5) Qualified as Optical Tracking Mount operators, Photo Controller and/or Acquisition Controller to operate the Time Space Position Information System;
- (6) Video/photo editing and archiving of test data and accident footage; and
- (7) Perform the Integrated Logistics Support for all specialized photo and video editing equipment.

#### **5.4 LOGISTICS SUPPORT BRANCH**

33. The Logistics Support Branch consists of 20 personnel and is responsible for the management of all administration functions at the unit. This includes the many functions

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associated with human resource management (military and civilian, training, staffing), financial management (budget forecasting and reporting) and material control (procurement, storage, shipping and receiving). Specific functions include the following:

- a. Human Resource Management
  - (1) General personnel (military and civilian) administration;
  - (2) Administration of candidates for test pilot school, post graduate and all other out of service training programs
  - (3) Training; and
  - (4) Staffing.
- b. Finance
  - (1) Travel claims approval and processing;
  - (2) Test pilot school contract development and maintenance;
  - (3) Contracting of other specialized training;
  - (4) Procurement of range time;
  - (5) Budget management of National Procurement and Operations and Maintenance funds; and
  - (6) Periodic expenditure reporting.
- c. Material Control
  - (1) Provision of Flight Test Instrumentation components;
  - (2) Provision of aircraft components; and
  - (3) Low-dollar value purchasing to support routine activities; and
  - (4) High-dollar contracting to support project requirements and capability growth and maintenance.

## **5.5 SAFETY BRANCH**

34. The Safety Branch consists of two personnel who are responsible to develop, promote and administer both the Flight Safety Program (including the Air Weapons Safety Program) and the General Safety Program. Some specific responsibilities include dissemination of educational material, conduct of Committee meetings, research and staffing of airworthiness investigation activities, conduct of surveys and investigations, implementation of a bird strike prevention program, correction of hazardous conditions and provision of advice on safety matters.

PROJECT ESTIMATE - AETE 2005-034

CF188 UNIVERSAL CAMERA PODS - DESIGN AND MANUFACTURE

**SITUATION**

1. The Aerospace Engineering Test Establishment has a requirement to provide Stores Separation Imagery capability for the CF188 Hornet. Historically the two instrumented CF188 legacy aircraft have served as the stores separation platforms for the CF188 fleet flight test requirements. With the Hornet fleet avionics system upgrading through the Engineering Change Proposal 583 programme and the availability of newer technologies in flight test instrumentation, the Aerospace Engineering Test Establishment has embarked on the upgrading of its Airborne Stores Separation Imagery acquisition capability. Project 2005-034 is an internal project that will upgrade the capability by initially concentrating on the wing tip imagery acquisition capability.

**AIM**

2. The aim of this project is to provide an initial high-speed imagery capability for the Post Avionics Upgrade CF188 aircraft fleet.

**OBJECTIVES**

3. Primary Objectives. The main objectives of this project are to:
- a. Establish the most cost effective design approach while meeting the aim;
  - b. Provide a feasible design and one manufactured prototype for each wing tip;
  - c. Provide manufacturing, installation and maintenance instructions for the new designs;  
and
  - d. Provide a design that is interoperable between the legacy and modernized CF188 aircraft.

**CONSTRAINTS AND LIMITATIONS**

4. Constraints. External constraints on this project:
- a. The availability of personnel. Postings, career courses, and higher priority projects through 1 Canadian Air Division requiring the expertise of personnel assigned to this project;
  - b. Requirements for outside engineering analysis from various agencies including an aerodynamic analysis to be completed by outside contractors;
  - c. Possible manufacturing requirement from local civilian sources, particularly for welding expertise, which would require contractual activity and/or funding; and

- d. Delivery times for camera lenses, filters, connectors and other material from manufacturers.

5. Limitations. Internal limitations to this project are:

- a. Funding availability versus other priority projects;
- b. The availability of personnel. Rotations, higher priority projects or other internal activity requiring the expertise of personnel assigned to this project;
- c. Personnel qualification. The external aerodynamics input identified at paragraph 4b will require internal scrutiny. Personnel with aerodynamics qualifications are currently employed in other areas and may not be available for timely action under this project; and
- d. Availability of aircraft. The prototypes built under this project will require ground testing, and installation and removal trials on aircraft. The timing for the latter activity may conflict with other CF188 flight test activities.

**TEST CONCEPT**

6. The project timeline has developed as knowledge of the system and its requirements increased. In order to move ahead in a timely matter this project will be conducted in five phases. The phases are described as follows:

- a. Phase One. Preliminary Design Review.
- b. Phase Two. Design and Manufacture.
- c. Phase Three. Wing tip camera installation and ground functional;
- d. Phase Four. Flight testing of wing tip cameras; and
- e. Phase Five. Capability enhancement.

7. This estimate covers the activities of phase one, two and three only. Phase four flight testing may be incorporated with other test programs or completed when fighter personnel aircraft resources become available. Follow-on development and testing will be carried out after phases one to four are completed.

8. Phase One -Preliminary Design Review. There was consideration given to changing the objectives of this project from a Wing Tip camera pod design to an External Fuel Tank pod design. Results of ground testing performed in Nov 2005 demonstrated that a Wing Tip design approach is the most practical first step in providing a modular and interoperable imagery capability. The development of the wing tip design continued in order to best develop the test article as follows:

- a. The new Wing Tip camera pods will rely on the current camera rail structure design. This will significantly simplify design, manufacturing, and airworthiness clearance of

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the new pods by restricting the matrix of usage possibilities; particularly where Structural and Aerodynamic considerations are considered.

- b. Fleet standard aircraft power and associated weapon system wiring already routed to each wing tip will be used for the camera pods. The weapon release and trigger signals will be used to trigger the camera pods' image acquisition. Each pod will contain two cameras, one computer/hard drive unit, and one time code generator as a minimum capability.

9. Phase Two - Design and Manufacture. The design and manufacture phase of this project requires that several forms of engineering analysis be completed. The following paragraphs describe the activities that must be completed prior to the ground functional commencing.

- a. Structural design, engineering and manufacturing.
  - i. The structural design will require drawing updates, as well as engineering analysis. The engineering analysis, which will be summarized in a Technical Note, will include consideration of the effects on the wing tips due to stores separation as well as an examination of the environmental effects at the wing tip due to temperature and more importantly vibration.
  - ii. Manufacture of the above items will be completed either by the Unit workshops or an outside agency.
- b. Electrical design, engineering and manufacturing.
  - i. The electrical design will require drawing updates and an Electrical Load Assessment summarized in a technical note.
  - ii. The electrical systems will be manufactured by Airborne Data Systems section.
- c. Supporting documentation. Documentation is required for the following:
  - i. Difference Data Sheet;
  - ii. Data Acquisition Plan;
  - iii. Install/uninstall of the pod on the aircraft;
  - iv. Operation and preparation of the cameras; and
  - v. Electrical and pod maintenance instructions.

10. Phase Three - Wing tip camera ground functional. The ground functional will complete an end-to-end test of the system and will analyze any delays within the system to ensure the video can be used to meet all requirements. It will consist of:

- a. Camera preparation for simulated mission;

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- b. Installation of pod on aircraft;
- c. Pre-flight procedures;
- d. In-flight simulation with camera recording functions;
- e. Ground test with practice weapon release;
- f. Post-flight procedures;
- g. Review of the captured images; and
- h. Removal of pod from aircraft

11. System programming and pod set-up can be conducted off the aircraft and will require one working day for two technicians. Aircraft installations will require one day and will require ground crew coordination amongst Maintenance, Imaging Section and Airborne Data Systems personnel.

## **REQUIREMENTS**

12. The following is required for this project:

- a. Time and Space. The manufacture and ground tests of the Wing Tip prototypes will occur before the end of Aug 06.
- b. Material. AETE will require further material prior to ground and flight testing. This includes the operational camera components as well as electrical and mechanical installation. These items have already been included in the budget and procurement of these items has begun.
- c. Personnel. Test team members will be drawn from the following sections:
  - i. Data Processing will provide engineering and design personnel for electrical, photo and structural and design requirements.
  - ii. Technical Services will provide airborne data and imagery acquisition technicians;
  - iii. Maintenance will provide CF188 qualified technicians, workshops personnel, and armament personnel;
  - iv. Fighter Evaluation will provide a representative to participate/witness ground tests;
  - v. Airworthiness will provide airworthiness support; and
  - vi. Avionics Systems will provide technical personnel to review the design.
- d. Flying Hours. Aircraft access for ground testing of the prototypes will be coordinated with the Operations Section. Access to an aircraft will be required for ground testing

of the Wing Tip prototypes. Flying hours for phase four will be coordinated at a later date.

- e. External Support. Contracted aerodynamic analysis input will be required. Completion time and level of service expected from the contractor is still to be determined. If vibration analysis is required, contractor support will also be required to support this activity;
- f. Experimental Flight Permit. There is no requirement for an Experimental Flight Permit at this time for Phase three. Phase four will require an Experimental Flight Permit; and
- g. Effort. The estimated amount of workdays forecasted for this project is based on expected tasks and the estimated level of effort for each task.

### **RISK**

13. The estimated project risk levels are presented in the table below premised on the design, manufacture, and ground test activities of this project. The overall project risk level is HIGH due to scheduling concerns for personnel and the Aerodynamic analysis activity. All risks are acceptable, except the schedule risks, which are partially outside of the control of the Aerospace Engineering Test Establishment.

<b>Risk Area</b>	<b>Risk Level</b>	<b>Comments</b>
<b>Safety</b>	Low	All manufacturing, installation & removal, ground testing, and airworthiness requirements are premised on common techniques and procedures.
<b>Environmental</b>	Low	No environmental risks are foreseen.
<b>Technical</b>	High	All design, manufacture, documentation reviews, and ground-testing requirements consist of processes, techniques, and procedures familiar to personnel. However, the installation environment at the wing tip is severe with respect to acceleration, vibration and shock therefore demanding capabilities from off the shelf equipment that do not exist. The possible failure of components on the wing tip is currently assessed as probable to occur and may result in major reduction in capabilities.



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<b>Schedule</b>	Medium	Aerodynamic evaluation of the pods is being completed by an outside agency. Final approval to accept and implement contractor's conclusions and recommendation will require internal effort. The availability of unit personnel could cause delays in the aerodynamic clearance which would delay the certification. Risks to the schedule due to shortage of personnel and personnel move plans also require planning and ongoing assessment. Higher priority projects, requiring a large amount of design effort, may also cause delays to the project.
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**Risk Descriptions**

**MILESTONES**

14. The project will be scheduled as follows

- a. Phase One Preliminary Design Review - February 06
- b. Aerodynamic models to contractor - 25 April 06
- c. Drawings, Engineering Documentation - 15 June 06;
- d. Aerodynamic analysis input received from contractor - 15 June 06.
- e. Manufacture - 15 July 06
- f. Ground Test Phase - 30 July 06
- g. Airworthiness documentation - 30 August 06
- h. Report Phase - 30 August 06

**PROJECT DELIVERABLES**

15. The following deliverables will be provided to the project sponsor:

- a. Left and right Wing Tip camera pod prototypes;
- b. Engineering design drawings, technical notes and airworthiness documentation to certify both prototypes as airworthy;
- c. Prototype maintenance, installation and removal, and technical operation instructions; and
- d. A final report consolidating the final synopsis of all aspects of the project, including a review of all engineering analysis and ground test results.

## PROJECT ESTIMATE

### 2008-037 CP140 ELECTRONIC SUPPORT MEASURES WINGTIPS PHASE III – FLIGHT TESTING

#### **SITUATION**

1. The Department of National Defence has acquired a new Electronic Support Measure system. The CP140 Aurora wingtips must be modified to accommodate two new antennas on each side. The new wingtips have been manufactured and certified by a contractor.
2. The forecast installation weight of 105 lbs per side will result in the heaviest known wing tip configuration for the CP140 aircraft. Weight increases at wing extremities and the potential carriage of external stores have raised concerns about instability. The aircraft designer has performed analyses to certify the new design to the basic aircraft limits. Based on the results of these analyses, the designer has recommended that, in the absence of further analyses or test, the aircraft airspeed and/or stores configuration be restricted.
3. A preliminary flight test of the CP140 equipped with new wingtips was conducted during the winter of 2006. The preliminary flight tests uncovered changes in the normal vibration characteristics encountered when the aircraft was subjected to abrupt manoeuvres, well outside of the flutter envelope predicted by the aircraft designer. The report concluded that clearance of the modification was not possible in the absence of further evaluation of the impact of these vibrations on the aircraft and the performance of the Electronic Support Measure system.
4. It is proposed to conduct additional flight testing on an instrumented aircraft to quantify the impact of the vibrations. Instrumentation requirements have been broadly defined with inputs from Department of National Defence engineering specialists and third party contractors.

#### **AIM**

6. The aim of this project is to provide engineering data and flight envelope recommendations for airworthiness approval of the new Electronic Support Measure wingtips on the CP140.

#### **OBJECTIVES**

7. The following specific objectives are to be met:
  - a. Determine test points and manoeuvres for test flight. Test planning should address areas of interest from both structural engineering and safe operational envelope standpoints;
  - b. Verify the proper calibration, functioning and data recording of the instrumentation installation;
  - c. Assess the flying and handling qualities of the modified aircraft;
  - d. Compare the flying and handling qualities of the modified aircraft to the baseline configuration;
  - e. Record data during flight test; and
  - f. Deliver properly formatted data to the sponsor for analysis.

## CONSTRAINTS AND LIMITATIONS

8. Constraints. The following are the external constraints on this project:
- a. The equipment and time required for the installation of the instrumentation will limit the testing to one aircraft;
  - b. It is desired to complete the testing and data analysis in advance of the commencement of the flight testing of the first aircraft modified with the new wingtips; and
  - c. There is a possible resource conflict with other projects, which may require flight test at the same time.
10. Limitations. Results are limited to the tested shape and weight of the new wingtips. Any changes to the shape and weight may require further testing.

## TEST CONCEPT

11. Phase III – The project flight test program will consist of seven flights. The first flight will confirm the serviceability of the instrumentation. Flights 2-4 will establish data for the baseline configuration. Flights 5-7 will examine the flying/handling qualities of the CP140 with the new wingtips. Flight testing will require four weeks to complete, and will also include a subjective evaluation of any vibration characteristics which may warrant flight envelope modifications. Handling quality assessments and qualitative vibration analyses will be conducted when and where necessary. Following flight testing, the instrumentation will be removed from the aircraft.
12. To ensure that the instrumentation is working as required for testing, during the last EMC flight, a left and right 45 ° AOB coordinated turn will be executed. These manoeuvres should excite all instrumentation and allow the project instrumentation engineer to verify the proper calibration, function and data recording of all instrumentation.

## REQUIREMENTS

13. The following are required for Phase III of the project:
- a. Time and Space. Phase III will take place at 14 Wing Greenwood and will take approximately four weeks to complete. Removal of the instrumentation will take approximately two weeks to complete;
  - b. Materiel. Modified wingtips and associated parts will be required for the testing;
  - c. Personnel.
    - (1) The following test personnel will be required:
      - (a) Qualified Test Pilot;
      - (b) Test Director;
      - (c) Project Instrumentation Engineer; and
      - (d) Air Data Systems technician.

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- d. Flying Hours.
  - (1) Test flights. Approximately 30 flying hours will be required; and
  - (2) Currency / proficiency flight. Three flights totalling approximately 10 hours will be required for test pilot proficiency prior to flight testing;
- e. External Support. The following external support is required to support this phase of the project:
  - (1) Project Sponsor:
    - (a) Funding for travel;
    - (b) Coordination of test point recommendations with the aircraft designer; and
    - (c) Coordination of material as detailed above; and
  - (2) Maritime Proving and Evaluation Unit: Completion of instrumentation Electromagnetic Compatibility testing; and
- f. Experimental Flight Permit. An Experimental Flight Permit will be required to fly with the new wingtips installed.

**RISK**

14. The estimated project risk levels are presented in the following table. The overall project risk level is MEDIUM. All risks are acceptable, except the project schedule risk, which is outside of the control of the Aerospace Engineering Test Establishment.

Risk Area	Risk Level	Comments
Technical	Low	All testing consists of familiar techniques and procedures.
Safety	Medium	Current and anticipated future flight limits will minimize the chance of significant vibrations.
Environmental	Low	No environmental risks are foreseen.
Schedule	Medium	Due to other CP140 projects.

**MILESTONES**

15. The following milestones are proposed:
- a. Test planning 2 July – 14 Sep
  - b. Safety Review Board 15 Sep
  - c. Flight testing 21 Sep – 16 Oct
  - d. Instrumentation removal 17 Oct – 30 Oct
  - e. Data analysis 17 Oct – 30 Oct

- f. Final report 30 Nov

**PROJECT DELIVERABLES**

16. The following deliverables will be provided to the project sponsor:
- a. Informal post-flight reports by e-mail describing progress through planned test events;
  - b. Recorded flight test data as soon as possible following completion of testing; and
  - c. A final letter report consisting of an executive summary of the test program results with all pertinent conclusions and recommendations.

## PROJECT ESTIMATE

### 2011-003 CF188 SOFTWARE INDEPENDENT VERIFICATION AND VALIDATION AND 2011-007 GUIDED BOMB UNIT 49 STORES CLEARANCE - PHASE 2

## SITUATION

15. The Canadian Forces have embarked on a series of avionics and mission system related projects, commonly referred to as the CF188 Incremental Modernization Project, designed to modernize the avionics suite of the CF188 and to extend the operational life of the CF188 fighter aircraft. In conjunction with the hardware upgrade, the Canadian Forces has procured software to provide the Incremental Modernization Project avionics suite with its full functionality.

16. The bulk of the software changes are related to the implementation of the Guided Bomb Unit 49, but also include other important changes to correct software anomalies and to address new requirements.

17. The software has been lab and ground tested at Mirabel using certified Test Stations and the actual aircraft (ground test). The Mirabel Simulator has also been used to verify the software prior to its release to Aerospace Engineering Test Establishment. Mirabel has used approved development and test procedures and test results are available.

18. The weapon selected to fulfill the Advanced Precision Guided Munitions Program requirement is the Guided Bomb Unit 49. As the Guided Bomb Unit 49 is a new store to the CF188, a full stores clearance test plan must be undertaken. Being a new weapon, a new software interface was also required.

19. Weapon testing will include a deployment for the purpose of live weapons tests to verify weapon system accuracy, functionalities and capabilities. This deployment will be conducted as an Integrated Test Team with the support of Fighter Operational Test and Evaluation Flight and will be estimated separately.

## AIM

20. The aim of this project is to provide recommendations for Airworthiness Approval of the updated CF188 software and provide recommendations for clearance of the Guided Bomb Unit 49 on the CF188.

## OBJECTIVES

21. The objectives for the software testing are as follows:

- a. Verify the correct functionality of the software following implementation of the software changes;
- b. Verify the correct functionality of the Guided Bomb Unit 49 with the updated software; and

- c. Evaluate and assess the updated software and supporting documentation to support findings for Airworthiness Approval and subsequent Technical Airworthiness Clearance.
22. The objectives for the Guided Bomb Unit 49 testing are as follows:
- a. Measure the mass properties of four Guided Bomb Unit 49;
  - b. Validate weapon assembly procedures and checklists;
  - c. Verify weapon loading/unloading procedures and checklists;
  - d. Verify the compatibility of mechanical and electrical interfaces with the CF188 aircraft;
  - e. Verify the correct functionality of the Guided Bomb Unit 49 on the CF188 aircraft with the updated software;
  - f. Assess the human factors of load crew and pilot interfaces with the Guided Bomb Unit 49;
  - g. Assess and evaluate the complete Guided Bomb Unit 49 weapon system and supporting documentation to support findings for Airworthiness Approval and subsequent Technical Airworthiness Clearance; and
  - h. Complete required preparation and training, and six Guided Bomb Unit 49 tests drops in Spring 2012 (exact dates to be determined).

## **CONSTRAINTS AND LIMITATIONS**

23. Constraints. The following are the constraints on this project:
- a. The updated software is an important element of the progression of several subsequent Canadian software loads, and is also required for operational use of the Guided Bomb Unit 49. As such, this project should be completed as soon as possible;
  - b. This testing and validation can only be performed if a functional Guided Bomb Unit 49 is available. National Defence Headquarters will be responsible to provide a sufficient number of weapons;
  - c. Execution of Guided Bomb Unit 49 testing is contingent upon timely delivery of test assets, documentation, supporting hardware and software, and successful completion of software integration testing. Delays in the delivery of any of the above will result in program delays;
  - d. Guided Bomb Unit 49 safety templates are required prior to start of weapon testing;



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- e. Testing is subject to the availability of suitable CF188 test assets. Loss of the test aircraft to support other taskings will incur a significant program delay; and
- f. The final report of weapon effectiveness is dependant upon delivery of reports and test data from the organization conducting the analysis. Delays in the delivery of analysis and reports will delay delivery of the final report.

24. Limitations. The following limitations will apply to this test program:

- a. Results pertaining to Guided Bomb Unit 49 will only be applicable to aircraft using the updated software.
- b. Due to limitations of the mass properties measurement system, roll axis mass properties of Guided Bomb Unit 49 will not be available.

**TEST CONCEPT**

25. Testing will be conducted in three phases: Phase 1. Software Safety of Flight; Phase 2. Guided Bomb Unit 49 Capability; and Phase 3. Software functionality:

- a. Phase 1 - Software Safety of Flight:
  - (1) Ground Test. Ground testing of the updated software will be conducted in CF188 aircraft at Aerospace Engineering Test Establishment in Cold Lake. The main thrust of this testing will be on cockpit displays and operations to confirm correct functionality of software changes while maintaining proven functionality of previous systems;
  - (2) Safety of Flight. One mission will be conducted to ensure safety of flight of the updated software. This test will involve a thorough evaluation of the cockpit displays that affect safety of flight. Confirmation of the correct display of visual and audible advisories, cautions, warnings, and voice alerts, along with basic flight data and navigation information will be assessed. A safety chase aircraft will be required during this testing;
  - (3) Navigation Regression Testing. Two sorties will be flown to confirm that navigation functionalities not evaluated during safety of flight testing have not been degraded;
  - (4) Datalink Regression Testing. Two sorties will be flown to confirm that datalink functionalities not evaluated during safety of flight testing have not been degraded;
  - (5) Inertial Navigation. One sortie will be flown over surveyed positions at Primrose Lake Evaluation Range to collect Time Space Position information to verify Inertial Navigation System accuracy;

- (6) Air to Ground Weapons. 10 missions will be conducted to verify system accuracy and functionality of live and inert air to ground weapons. One test aircraft and one additional CF188 for photo chase will be required. This will include cannon, live / inert bombs and practice bombs:
- (7) Air to Air Weapons. 14 missions will be conducted to evaluate changes and upgrades to the Air to Air weapons modes. One test aircraft and one additional CF188B will be required. This will include cannon and live missiles:
- (8) Radar. Two sorties will be flown against a target aircraft equipped with electronic warfare equipment to verify radar functionality in an active electronic warfare environment;
- b. Phase 2 - Guided Bomb Unit 49 Capability:
  - (1) Four sorties will be flown with up to four Guided Bomb Unit 49 to collect aircraft data for analysis and verification of aircraft Inertial Navigation System accuracy. One test aircraft, as well as one additional CF188B for photo chase on the first sortie, will be required; and
  - (2) Up to six sorties will be flown to conduct live drops of six live / inert Guided Bomb Unit 49 at a deployed location. One CF188B will be required for photo chase on the first sortie; and
- c. Phase 3 – Software functionality:
  - (1) Simulator Test. Six simulator flights, three for each project pilot, to multiple en-route facilities and airports will be conducted to verify Instrument Flight Rules functionalities and database completeness;
  - (2) Safety of Flight. One mission will be conducted to ensure safety of flight of the updated software. This test will involve a thorough evaluation of the cockpit displays affecting safety of flight. Confirmation of the correct display of visual and audible advisories, cautions, warnings, and voice alerts, along with basic flight data and navigation information will be assessed. A safety chase aircraft will be required during this testing;
  - (3) Navigation Regression Testing. Four missions will be required to ensure the updated software does not result in a loss of accuracy of navigation and weapons systems. These sorties will include items not evaluated during safety of flight testing. A CF188 safety chase aircraft will be required for up to three sorties; and
  - (4) Instrument Flight Rules. 12 sorties, six for each project pilot, will be conducted to verify Instrument Flight Rules functionality. Area Navigation and Global Navigation Satellite System navigation will be conducted to multiple airports, with emphasis on assessing the expanded capabilities provided by the updated software.

## **REQUIREMENTS**

### **Time and Space**

26. The evaluation will take place at 4 Wing Cold Lake and major international airports over approximately a sixteen week period. Testing of Guided Bomb Unit 49 will require the use of an instrumented test range outside of Canada. The project officer will expend an estimated 60 working days.

### **Internal Support**

#### Fixed Wing Evaluation

27. Fixed Wing Evaluation will be responsible for the planning and execution of all ground and flight testing, expending an estimated 120 working days.

#### Avionics System Evaluation

28. Avionics System Evaluation will be responsible for planning and analysis of the Instrument Flight Rules flight testing, expending an estimated 30 working days.

29. Avionics System Evaluation will be responsible for reviewing compliance documentation from previous electro-magnetic compatibility testing conducted on the Guided Bomb Unit 49 to ensure no further testing is required.

#### Aircraft Maintenance

30. Aircraft Maintenance will provide maintenance and servicing support, expending an estimated 50 working days.

#### Rotary Wing Evaluation

31. Rotary Wing Evaluation will provide aircraft and crew to transport personnel to range targets for coordinate verification during Navigation testing. This should take two missions, requiring a total of two working days.

#### Data Acquisition and Processing

32. Data Acquisition and Processing will provide data acquisition and reduction, which includes installing aircraft instrumentation systems, and extracting, reading, tabulating, and manipulating recorded flight information. Data Acquisition and Processing will expend an estimated 40 working days.

33. Data Acquisition and Processing will analyze weapon delivery accuracies for the CF188 Air to Ground weapons employed during this testing.

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34. Data Acquisition and Processing will measure mass properties for four Guided Bomb Unit 49 as per paragraph 8a subject to the limitation at paragraph 10b.

Technical Support

35. In order to verify that the aircraft navigation solution is accurate during weapons deliveries, up to six missions will require collection of Time Space Position information.

36. Photo chase will require one Image Technician.

**External Support**

4 Wing

37. 4 Wing will provide:

- a. Electronic Warfare support during verification of radar warning receiver functionality;
- b. Airspace to conduct testing; and
- c. Access to Jimmy Lake and Shaver Ranges.

1 Canadian Air Division

38. 1 Canadian Air Division will provide the following:

- a. 123 flying hours for CF188 and three flying hours for contracted aircraft support to complete testing;
- b. Two CF188 aircraft with updated software; and
- c. Maintenance augmentation, particularly armament support.

Project Sponsor

39. The project sponsor will provide funds for:

- a. Storage media and hard drives for data archiving and shipment;
- b. Personnel to fly to Mirabel for training and liaison. It is anticipated that a maximum of four personnel (two Qualified Test Pilots and two Flight Test Engineers) will be required for up to two one week periods each;
- c. Personnel to conduct deployed operations during Phase III testing at international airport(s) such as, but not limited to, Vancouver or Edmonton. It is estimated that up to three personnel (two Qualified Test Pilots and one Flight Test Engineer) will be required for a one week period;

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- d. Draft aircrew briefing documents, checklists, limitations, and tactics manual descriptions;
- e. Weapon planning data, software and tools; and
- f. Weapon breakout, assembly, load and unload procedures.

**RISK**

40. The estimated project risk levels are presented in Table 1 below. The overall project risk level is MEDIUM.

Risk Area	Risk Level	Comments
Safety	Medium	The updated software has been lab and ground tested, but does impact flight critical displays and navigation data.
Environmental	Low	No environmental risks are foreseen.
Technical	Medium	Most of the testing consists of familiar techniques and procedures. All software lab and ground test documentation has been delivered. Navigation flight test will be challenging as it is not routine procedure.
Schedule	Medium	Higher priority projects will affect this project's schedule. Availability of aircraft and test aircrew will be a factor.

Table 1 - Risk Descriptions

**MILESTONES**

41. The project will be scheduled as follows:

Estimate Acceptance – 2 Sep 2011  
Technical Review Board – 7 Oct 2011  
Safety Review Board – 9 Oct 2011  
Flight Test (Phase I) – 10 Oct 2011 to 20 Jan 2012  
Flight Test (Phase II) – 18 Nov 2011 to 30 Dec 2011  
Flight Test (Phase III) – 30 Dec 2011 to 10 Feb 2012  
Analysis Phase – 11 Feb 2012 to 25 Feb 2012  
Initial report release:  
Phase I – 18 Feb 2012  
Phase II – 4 Mar 2012  
Phase III – 25 Mar 2012  
Final report release – 29 Apr 2012

**PROJECT DELIVERABLES**

42. The following deliverables will be provided to the project sponsor:
- a. Interim Report: Identification of all Airworthiness critical software or operational anomalies in an interim letter report to the Technical Authority within five working days of each phase of testing;
  - b. Interim Report consisting of an executive summary of the weapon test results with all pertinent conclusions and recommendations within 30 working days of the end of test completion; and
  - c. Final Report: An abridged evaluation report consisting of an executive summary of the test program results with all pertinent conclusions and recommendations within 45 – 60 working days of the completion of test flights and delivery of relevant reports/analysis from external agencies.

# **REQUEST FOR INFORMATION**

## **TITLE: ENGINEERING FLIGHT TEST RATIONALIZATION (EFTR)**

### **Contents**

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### **1 PURPOSE**

This Request for Information seeks information from industry on its interest in, capacity for, and ability to deliver specified functional capabilities of the Aerospace Engineering Test Establishment as further described within this Request for Information. The Request for Information also seeks information from industry on innovative business models that would enable the long term and efficient delivery of steady state Aerospace Engineering Test Establishment requirements as well as providing for scalability to meet engineering test and evaluation surge requirements.

### **2 BACKGROUND**

Canada is requesting Industry feedback to assist with the formulation and implementation of a comprehensive rationalization of the delivery of engineering flight test and evaluation capabilities on behalf of the Government of Canada Department of National Defence.

The Engineering Flight Test Rationalization initiative forms an element of the Defence Renewal – Sustainment Initiative. The Sustainment Initiative aims to institutionalize ways to achieve value for money through the implementation of industry best practices that leverage and align the capabilities of both the Government of Canada and Industry.

An initial Community Consultation with the Canadian aerospace industry community was conducted in Ottawa on 26 – 27 February 2015 (Buyandsell.gc.ca Reference #PW-15-00670644). The objectives of the Community Consultation were to:

- Inform the Canadian aerospace community of the Engineering Flight Test Rationalization (EFTR) Project;
- Familiarize the community with the role and capabilities of the Aerospace Engineering Test Establishment (AETE);
- Initiate discussion on possible areas of community interest for outsourcing and partnerships; and
- Solicit community input on flight test best practices

The objective of this Request for Information is to solicit relevant feedback from Industry on methods that could enable the effective and economical provision of some of the engineering flight test and evaluation functions that are now carried out at the Aerospace Engineering Test Establishment (AETE) in Cold Lake Alberta, including higher fidelity information than was obtained at the initial Community Consultation.

The scope of the Engineering Flight Test Rationalization initiative includes:

- 1) Rationalization: Thoroughly review the DND engineering test and evaluation requirements with a goal to:
  - a. Identify and recommend divestment of non-essential capabilities;
  - b. Identify the requirement for new capabilities; and
  - c. Identify the requirement for enhancement of existing capabilities;
- 2) Location: Identify potential opportunities through co-location with like-minded agencies and organizations with a goal to increase overall efficiency and synergies to potentially revolutionize how DND delivers engineering test and evaluation services; and
- 3) Outsourcing: Provide analysis to support outsourcing options for some or all existing engineering test and evaluation capabilities where such options would potentially realize enhancements to these capabilities while also optimizing resources (financial, personnel and infrastructure) and providing opportunities to Canadian industry.

The Engineering Flight Test Rationalization envisages the potential for an integrated and strategic industry government teaming arrangement, or arrangements that cost effectively meet steady state performance requirements including the capability to rapidly scale to meet surge requirements during times of heightened operational tempo. As the Engineering Flight Test Rationalization potentially involves a number of long term contractual arrangements (nominally up to 15 years), the Government of Canada is seeking innovative business solutions to meet DND's current engineering test and evaluation requirements, as well as providing any identified new capabilities, in a manner that ensures stability over the longer term. Industry is therefore encouraged to propose mutually beneficial and innovative business models and processes that improve the agility and cost effectiveness of any proposed engineering test and evaluation service delivery construct. Some of the concepts that have demonstrated suitability in similar requirements include, but are not limited to, the following:

- 1) Public-Private-Partnerships (P3);
- 2) Non-profit organization integration; and
- 3) Consortium agreements that maximize efficient member involvement.



### 3 REQUEST FOR INFORMATION PROCESS AND SCHEDULE

The Request for Information process and schedule is as follows:

Action	Date
Industry Submission of Interest is received no later than:	9 September 2015
Canada reviews Industry Submissions.	September 2015
Respondents are notified of a requirement for a one-on-one engagement with Canada. One-on-one meeting venues and schedule will be agreed upon by Canada and the respondents.	October 2015

### 4 REQUIREMENTS – WORK PACKAGES

At this stage in the Engineering Flight Test Rationalization initiative, industry best practices and recommendations are being sought in order to formulate and implement an Engineering Flight Test Rationalization acquisition process. As such, Canada is providing information on the existing functionality, level of effort currently being expended within each functional delivery area, and where possible, identifying specific minimum requirements for each work package being considered for outsourcing. The work packages that are introduced hereunder, and detailed in Attachments to this Request for Information, have been prepared in such a manner as to provide maximum opportunity for Canadian industry to participate efficiently and effectively. Five (5) work packages are defined in this Request for Information, as follows;

- a. ***Proficiency Flying Work Packages:*** Three separate work packages are provided in Attachments 2 through 4, one each for Rotary Wing, Multi Engine, and Fast Jet proficiency flying requirements. Canada is seeking the provision of flying hours to satisfy proficiency requirements. Proficiency refers to that flying which is required to maintain generic qualified test pilot, flight test engineer, and qualified systems evaluator proficiency. Please note that the terms qualified test pilot, flight test engineer, and qualified systems evaluator are explained in Attachment 7 - AETE Detailed Capabilities. Flight test engineer and qualified systems evaluator flight proficiency requirements are entirely accomplished in conjunction with qualified test pilot proficiency flying. These aircraft will only be used for proficiency flying within the approved flight envelope, and will not be used for flight test project use. Each proficiency flying work package provides the following minimum information, however Industry is encouraged to propose suitable aircraft for consideration:
  - i) Work Package Scope;
  - ii) Requirements:
    - o General;
    - o Aircraft Flying Hour Requirements;
    - o Maintenance and Servicing Requirements;
    - o Proficiency Aircraft Essential Requirements; and
    - o Proficiency Aircraft Desirable Characteristics.

- b. **Engineering Support Work Packages:** Two (2) separate Functional Support Work Packages are defined in Attachments 5 and 6, one for Engineering Support and one for Flight Test Support, the latter of which includes range operations. The requirements for each of these work packages are organized as follows:
  - i) Types of Work and Level of Effort Estimates;
  - ii) Requirements Scope; and
  - iii) Policies and Standards Compliance.

## 5 GEOGRAPHICAL AREA OF SERVICE DELIVERY

One objective of Engineering Flight Test Rationalization is to evaluate potential alternate locations for AETE with a goal to improve the efficiency of the Unit and ensure long term sustainability. It is the intent of DND to have an integrated test capability; therefore this service delivery must be located in the same geographical area as AETE. Industry is invited to propose location(s) for AETE at which they could best provide the requested capabilities, including their preferred location, and provide supporting information on potential cost premiums if proposing multiple locations. In addition, it is requested that industry provide a submission for the current location of AETE in Cold Lake, including any cost impact. Although evaluation of potential alternate locations is an objective, there is no stated requirement to relocate AETE. A rationalized AETE in Cold Lake could be a viable solution. The following criteria were used to help assess potential locations:

1. Proximity to air travel centre;
2. Located next to a runway suitable for operations;
3. Proximity to project sponsors and other government departments with Research and Development or engineering test and evaluation flight operations;
4. Proximity to military and family support functions;
5. Access to uncongested airspace;
6. Proximity to comparable commercial aerospace engineering test and evaluation flight operations; and
7. Availability of specialized human resource pool.

## 6 INFRASTRUCTURE AND SERVICE SUPPORT

Should it be decided to move the Aerospace Engineering Test Establishment to a new location other than a DND facility, infrastructure and service support will be required. Although the requirements have not yet been fully defined, infrastructure and service support could include (this is not an all-inclusive list):

1. Hangar space (Sized to accommodate a CC130 aircraft, ideally co-located with office and workshop space);

2. Office space (Space for approximately 100 personnel, to include desk, chair file cabinet and storage space);
3. Instrumentation design/fabrication workshop space (Space for approximately 40 personnel);
4. Information technology support (To include provision of telephones, computers, printers, fax machines, Defence Wide Area Network access, etc); and
5. Service support (The provision of all essential support services for approximately 140 DND military and civilian personnel. To include, but not limited to, food services, gymnasium facility, provision of stationary supplies, waste removal, etc).

Industry is invited to provide information regarding their ability to satisfy this generic type of requirement.

## **7 INDUSTRY SUBMISSIONS**

Canada is seeking Industry feedback from companies who:

- a. Are involved in flight test and evaluation or related activities as describe in Section 4 of this Request for Information and in the Work Package attachments to this Request for Information; and/or
- b. Provide aircraft and maintenance services suitable for proficiency training on multi-engine, rotary wing and fast jet aircraft types as described in Section 4 and in the relevant Work Package attachments to this Request for Information; and/or
- c. Are Accredited Design Organizations, or can be Accredited Design Organizations, with experience in design, certification, manufacture, installation and maintenance of flight test items, prototypes, instrumentation, and data acquisition systems (including airborne photography and high speed onboard cameras) as described in Section 4 and in the associated Work Package attachments to this Request for Information; and/or
- d. Perform relevant engineering or test support services as described in Section 4 and in the associated Work Package attachments to this Request for Information; and/or
- e. Preferably have done business in the Defence Sector.

Additionally, Canada is seeking Industry feedback from Companies who are capable of delivering one (1) or more of the Work Packages identified in Section 4 and in the associated Work Package Attachments to this Request for Information. Companies who can deliver portions of work packages are invited to form or join teams that are capable of providing full or multiple work package requirements.

A consolidated list of response items for this Request for Information is at Annex A.

## **8 REVIEW OF THE REQUEST FOR INFORMATION**

After receipt of the submissions, Canada will determine the length of time necessary to review the industry submissions with respondents and will propose suitable venues for one-on-one meetings.

## 9 SECURITY

This Request for Information is Unclassified, however any subsequent Request(s) for Proposal will include several security requirements, including:

- a. Personal security clearances ranging from Enhanced Reliability to Top Secret (Level III);
- b. Capability to conduct classified data processing; and
- c. Certification under the Controlled Goods Program.

DND recognizes that the disclosure of Foreground and Background Information related to technical support of major weapon systems to third parties may be a major issue. DND's ability to disclose Foreground and Background Information will depend on the specific proprietary data clauses included in the original acquisition contracts with the Original Equipment Manufacturers and, as applicable, export restrictions imposed by foreign governments upon issuance of the original export authorization for the information and assets to DND. DND will also need to obtain, as applicable, the approval(s) from foreign governments to retransfer Foreground and Background Information which is subject to the Controlled Goods Regulations or otherwise restricted from disclosure outside of DND. In the event of major restrictions on DND's ability to disclose Foreground and Background Information to third parties, DND may elect not to proceed with the outsourcing of Engineering Support and Flight Test Support. DND requests comments on how Industry feels these issues can be managed and or overcome.

Recognizing that DND will retain responsibility for conduct of the actual testing, data evaluation and issuance of conclusions and recommendations, there is a concern about the potential for conflict of interest, or the perception of conflict of interest, should a company be involved in the provision of engineering support and / or flight test support to the evaluation of a test item designed or manufactured by the same company. DND requests that industry comment on and / or provide recommendations to address this concern.

## 10 GOVERNMENT OF CANADA POLICY ISSUES

### Industrial and Technological Benefits

Proponents of the Engineering Flight Test Rationalization should be aware that any contracts that are entered into as a result the Engineering Flight Test Rationalization may contain Industrial and Technology Benefits (ITB) requirements, including a Value Proposition. Under the ITB Policy, companies awarded defence procurement contracts are required to undertake business activities in Canada, equal to the value of the contract. In addition, a core element of the ITB policy is a rated and weighted Value Proposition. Bidders will be motivated to put forward their best Value Proposition for Canada in their bid proposal, as industrial considerations will directly influence which bidding firm wins a contract. Additional information on the ITB policy can be found at [www.ic.gc.ca/itb](http://www.ic.gc.ca/itb).

If it is determined that the ITB policy will not apply to procurements related to the EFTR, other methods of leveraging industrial activity may be considered by Canada.

Canada is requesting that Industry provide information regarding Canadian capabilities, export potential, R&D activities, and industrial opportunities to help Canada determine the best leveraging approach for procurements that may occur as a result of EFTR. A list of questions are contained in Annex A (Consolidated List of Response Items) in the Government of Canada Policy Issues section.

## **11 NO OBLIGATION**

The issuance of this Request for Information does not create an obligation for Canada to issue a subsequent bid solicitation and does not bind Canada legally or otherwise, to enter into any agreement or to accept any suggestions from industry.

This industry consultation process is not a bid solicitation and a contract will not result from this request.

Potential respondents are advised that any information submitted to Canada in response to this industry consultation process may be used by Canada in the development of any subsequent competitive Request(s) for Proposal. However, the Government is not bound to accept any expression of interest or to consider it further in any associated documents such as Request(s) for Proposal.

The issuance of this industry consultation process does not create an obligation for Canada to issue any subsequent Request(s) for Proposal, and does not bind Canada legally or otherwise, to enter into any agreement or to accept any suggestions from organizations. Canada reserves the right to accept or reject any or all comments received.

There will be no short listing of firms for purposes of undertaking any future work, as a result of this industry consultation process. Similarly, participation in this industry consultation process is not a condition or prerequisite for participation in any subsequent Request(s) for Proposal.

Companies participating in this industry consultation process should identify any submitted information that is to be considered as either company confidential or proprietary.

All enquiries and other communications related to this industry consultation process shall be directed exclusively to the Contracting Authority.

## **12 CLOSING DATE**

Responses to this Request for Information shall be submitted directly to the Contracting Authority on or before the closing date specified on page 1 of the Request for Information.

## **13 CONTRACTING AUTHORITY**

All enquiries and other communications related to this Request for Information shall be directed to the Contracting Authority as follows:

All inquiries and submissions are to be provided to Public Works and Government Services Canada by 9 September 2015:

Dwight Yachuk  
Manager ASD and Special Projects  
Place du Portage  
Phone 613-219-4553

In addition, to obtain the attachments 2 through 7, please forward a signed copy of the participation agreement to Mr. Yachuk who will transmit the attachment upon receipt of the participation agreement.

**Annex A:** Consolidated list of response items

**Attachments:**

Attachment 1 – Participation Agreement

Attachment 2 – Rotary Wing Proficiency Flying Work Package

Attachment 3 – Multi-Engine Proficiency Flying Work Package

Attachment 4 – Fast Jet Proficiency Flying Work Package

Attachment 5 – Engineering Support Work Package

Attachment 6 – Flight Test Support Work Package

Attachment 7 – Aerospace Engineering Test Establishment Capabilities Document (Including example projects)

Annex A to Engineering Flight Test Rationalization  
Request for Information

CONSOLIDATED LIST OF RESPONSE ITEMS

Main Body – Geographic Location

1. Industry is invited to propose location(s) for AETE at which they could best provide the requested capabilities, including their preferred location, and provide supporting information on potential cost premiums if proposing multiple locations.
2. Industry is requested to provide a submission for the current location of AETE in Cold Lake, including any cost premium.
3. DND requests comments on the validity of the criteria listed at Section 5 - Geographical Area of Service Delivery.
4. Industry is invited to provide information on their ability to satisfy the preliminary Infrastructure and Service Support requirements at Section 6.
5. DND requests industries comments on how they feel the issue of disclosure of Foreground and Background Information related to technical support of major weapon systems to third parties can be managed and / or overcome (Section 9)
6. DND requests that industry comment on, and / or provide recommendations to address the concern about the potential for conflict of interest, or the perception of conflict of interest, should a company be involved in the provision of engineering support and / or flight test support to the evaluation of a test item designed or manufactured by the same company (Section 9).

Rotary Wing Proficiency

7. Industry is requested to propose solutions that satisfy the flying hour requirements at Section 4.2 of Attachment 2, including budgetary cost estimates based on a 3-5 year contract period.
8. Industry is requested to propose aircraft for the provision of flying hours that would meet the essential aircraft capability requirements at Section 4.4 of Attachment 2, and preferably meet the desirable aircraft capability characteristics at Section 4.5 of Attachment 2.
9. Industry is invited to provide feedback on the essential and desirable aircraft capability requirements at Section 4.4 and Section 4.5 of Attachment 2 respectively.

Multi-Engine Proficiency

10. Industry is requested to propose solutions that satisfy the flying hour requirements at Section 4.2 of Attachment 3, including budgetary cost estimates based on a 3-5 year contract period.
11. Industry is requested to propose aircraft for the provision of flying hours that would meet the essential aircraft capability requirements at Section 4.4 of Attachment 3, and preferably meet the desirable aircraft capability characteristics at Section 4.5 of Attachment 3.
12. Industry is invited to provide feedback on the essential and desirable aircraft capability requirements at Section 4.4 and Section 4.5 of Attachment 3 respectively.

Fast Jet Proficiency



## Annex A to Engineering Flight Test Rationalization Request for Information

13. Industry is requested to propose solutions that satisfy the flying hour requirements at Section 4.2 of Attachment 4, including budgetary cost estimates based on a 3-5 year contract period.

14. Industry is requested to propose aircraft for the provision of flying hours that would meet the essential aircraft capability requirements at Section 4.4 of Attachment 4, and preferably meet the desirable aircraft capability characteristics at Section 4.5 of Attachment 4.

15. Industry is invited to provide feedback on the essential and desirable aircraft capability requirements at Section 4.4 and Section 4.5 of Attachment 4 respectively.

### Engineering Support

16. Industry is requested to propose cost effective innovative solutions employing industry best practices that satisfy the requirements at Section 4 of Attachment 5.

17. Industry is requested to provide budgetary cost estimates for provision of the solution identified at Item 16 above based on a 15 year contract period (Initial contract period of five years, with two option periods of five years each).

### Flight Test Support

18. Industry is requested to propose cost effective innovative solutions employing industry best practices that satisfy the requirements at Section 4 of Attachment 6.

19. Industry is requested to provide budgetary cost estimates for provision of the solution identified at Item 18 above based on a 15 year contract period (Initial contract period of five years, with two option periods of five years each).

20. Industry is requested to identify any Government Furnished Equipment deemed necessary by industry to satisfy the requirements at Section 4 of Attachment 6 (eg Link 16 ground stations).

### Government of Canada Policy Issues

21. Industry is requested to comment on any potential challenges with providing the service. Industry is requested to provide information on the following questions related to the EFTR. Responses should indicate which of the five work packages the information is related to, as well as, indicate if it is related to a proposed new location and any associated infrastructure and service support.

- a) How much and what type of work is your company capable of doing in Canada under procurements that may occur as a result of EFTR?
- b) Is the capability to do this work already established in Canada or do these areas require investment?
- c) To what extent would Canadian suppliers be able to participate directly in these work activities?
- d) How would work in the areas outlined above position you and your suppliers for future export opportunities?
- e) To what extent do you propose to undertake R&D activities in Canada related to procurements that may occur as a result of EFTR? Is there scope for Canadian post-secondary institutions to be involved?

Annex A to Engineering Flight Test Rationalization  
Request for Information

22. Industry is requested to provide information on the following questions on other areas of economic opportunity.

- a) Where do you see strategic opportunities for Canada that could be leveraged as a result of these procurements in the defence sector or in other economic sectors?