



CF-18 REPLACEMENT

INDUSTRY CONSULTATION

QUESTIONNAIRE

SUMMER 2016



**CF-18 REPLACEMENT**

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**General Assumptions and Description of Cost Elements**

**General Assumptions:**

The life-cycle cost estimate will cover development, acquisition, operating, sustainment and disposal costs.

All year references refer to calendar years.

All costs are to be stated in 2016 prices, in the Supplier’s national currency. No foreign exchange is to be applied within the Supplier’s responses.

Suppliers are to assume the aircraft are purchased by Canada and not leased.

Suppliers are asked to return the provided Excel-templates with their completed responses in electronic format.

To enable a better understanding of Supplier costs, as well as to enable incremental analysis, Suppliers are asked to break down all costs into variable and fixed cost categories. Any assumptions made by Suppliers in the calculation of the costs are to be explained in the “Additional Details & Assumptions” column of the Excel tables.

In determination of aircraft quantity, suppliers are asked not to account for aircraft attrition.

**Descriptions of Cost Elements:**

1.     Development Costs

To include any Research and Development recoupment fees, test and evaluation, studies, industrial participation costs, access to technologies and data, any cost to be shared among clients related to program administrative support, or other pre-production costs.

2.     Acquisition Costs

One-time costs associated with bringing new equipment into service. The acquisition cost estimate includes:

- a.     Unit-Recurring Flyaway Cost: to include
  - airframe
  - propulsion system (i.e. engines)
  - latest available mission systems as follows:
    - a)     AESA Radar. Multi Role, Multi Mission, Electronic Attack (if able);
    - b)     Offensive/Defensive systems: integrated jammers (internal or podded) including towed decoys (if available);
    - c)     Hardened Cyber Counter Measure Systems;
    - d)     RF/IR countermeasures systems;
    - e)     Radar Warning Receivers, Missile Warning Receivers (if available);
    - f)     EO/IR Targeting systems (internal or podded);
    - g)     SATCOM (internal or podded);
    - h)     ADS-B, RNAV, CIT (all modes including Mode 5 and S);
    - i)     Link 16: MIDS JTRS compliant; and
    - j)     Fighter to Fighter discreet data link (if available).
  - vehicle systems ( landing gears, flaps, ailerons, etc.)
  - engineering change orders (non-recurring engineering (NRE) production modification costs)
  
- b.     Concurrency Modifications: Cost associated with the implementation of post-acceptance modifications.

## Industry Consultation Questionnaire - CF-18 Replacement

- c. Diminishing Manufacturer Sources: Cost associated with the loss of a source of supply for parts or raw materials needed in the development, production or post-production support of an aircraft or equipment.
- d. Ancillary Equipment: helmet mounted displays, external fuel tanks, weapons launchers, racks and pylons necessary for question CAP-1 profile 3 aircraft configuration. Also to include Aviation Life Support Equipment (ALSE) such as harnesses, flight suits, immersion suits, winter suits, etc.
- e. Sustainment Set-Up:
  - Simulators: 8 flight simulators and 2 sets of aircraft maintenance training aids, and any related unique infrastructure
  - Mission Planning: software, hardware required pre-mission
  - Post Mission Debriefing system: software, hardware required to conduct full visual debrief of missions
  - Support Equipment: Aircraft support equipment and tooling, such as aircraft ground power units, hydraulic test stands, aircraft cooling units, and specialized aircraft maintenance tools, and test equipment necessary to meet the support requirements associated with operations while in Canada and deployed.
  - Logistics / Maintenance Information System: Costs of any systems, consisting of computers, network infrastructure and software programs, delivered as part of the Weapon System, required to provide integrated maintenance, logistics, training management, and operations support to the new aircraft;
  - Logistics Setup Labour: Contracted labour costs associated with the procurement and delivery of the sustainment solution. This encompasses resources necessary to plan and coordinate the introduction of the new fleet into service, including the supply chain, sustaining engineering, Logistics Information System support, or software maintenance, that may not be included in other cost elements.
  - Depot Stand-up: to include costs of aircraft and equipment repair beyond the capability of Canadian operational bases which need to be performed at Government or commercial depot facilities. Includes the cost associated with developing unique depot repair procedures and tools necessary for sustainment of the new aircraft fleet.
- f. Initial Spares: Initial spares: initial acquisition of spare parts is required, as well as consumable items such as tires and lubricants. The specific quantity of parts is determined by currently anticipated reliability and maintenance information, as well as operational parameters, such as the number of aircraft and operating locations, and the operating environment such as cold-weather operations.
- g. Reprogramming Capability: The new aircraft is likely equipped with sensors (e.g. radar, electro-optical, infra-red, communication, etc.) that must be reprogrammed so that they continue to recognize and properly categorize what they are detecting. In the case of advanced aircraft, programming also ensures that the output of the full suite of sensors is reconciled, or integrated into a single source of information for the pilot. The software reprogramming effort, the equipment, and the facilities required to support an advanced system may exceed the Canadian Forces' current capabilities. The estimate should include any costs, whether wholly Canadian, or Canada's contribution if the cost is shared among other partners, for any required software reprogramming capability.
- h. Weapons & Ammunition: Weapons currently in the Canadian Forces inventory that can be employed on the new aircraft will be retained. If the current CF-18 gun ammunition, deployable countermeasures (e.g. chaff/flares), missiles and bombs, are incompatible with the new aircraft this item should include the cost of an initial stock of such items. If

current CF-18 weapons are compatible with the new aircraft, the cost of certifying their use on the new aircraft should also be included under this item.

- i. Initial Training: Costs associated with the establishment of initial training for the transition of aircrew and support personnel, including any fees for service that will be charged to Canada for participating in any group training. Initial training should be provided to 100 pilots and 250 technicians. For purpose of determining associated costs, assume the longest conversion training time is applicable to all Canadian Forces aviation technician trades (AVN, AVS, ACS and AWS, see ISS-8 for definition of trades).

3. Sustainment Costs

For the purpose of determining sustainment costs, assume the following sustainment construct. Regarding location of the work performed, the below construct shall be in agreement with your proposed sustainment arrangement in question IB-3 a.

- 1<sup>st</sup> Line maintenance (O Level): Performed by military personnel and supported by limited 1<sup>st</sup> line contracted field service representatives (technical experts).
- 2<sup>nd</sup> Line maintenance (I Level): 2<sup>nd</sup> line maintenance activities deemed necessary (deployed) for expeditionary operations performed by military personnel. All other maintenance activities performed by industry outside DND facilities.
- 3<sup>rd</sup> Line maintenance (Depot Level): Performed by industry at industry facilities.
- Sustaining engineering: Performed by industry.
- Management support: A mix of industry and military personnel where military resources perform strategic & performance oversight of the contracted sustainment enterprise.
- Supply chain management: Performed by industry where parts are delivered/exchanged at 1<sup>st</sup> line facilities. In deployed scenario, parts delivered to a DND facility for forward deployment by military supply system.
- Spare parts: Owned by DND and maintained by industry, consumables procured by industry.
- Maintenance training: Initial training performed and delivered by industry in industry facilities. For sustainment training, assume contracted led in government facilities.
- Operator training: Initial training performed and delivered by industry in industry facilities. For sustainment training, assume contracted led in government facilities.
- System upgrades and modification: Performed by industry.
- Electronic Information Environment: Provided and supported by industry.

The Canadian maintenance support concept is envisioned as a 1st (O Level) to 3rd Line (Depot Level) maintenance approach with limited 2nd Line (I Level). The majority of on-aircraft maintenance will be done at the O Level and will consist of the replacement of Line Replaceable Components (LRC)/Line Replaceable Units (LRU) and the return of unserviceable items to the supply chain.

## Industry Consultation Questionnaire - CF-18 Replacement

The sustainment cost estimates should include contracted labour and material costs related to:

- a. Maintenance Cost: Planned and unplanned activities intended to keep the system in (or to return it to) a given state. Costs are to be broken down into the three maintenance levels:
  - 1<sup>st</sup> Line (O Level): maintenance includes preventive maintenance and corrective maintenance tasks of a minor nature. Maintenance includes corrective maintenance by repair or replacement of parts and assemblies limited only by time (usually 24 hours).
  - 2<sup>nd</sup> Line (I Level): maintenance includes corrective maintenance of longer duration than level 1, reconditioning of assemblies, rebuild of minor components, and limited calibration.
  - 3<sup>rd</sup> Line (Depot Level): Maintenance includes the complete overhaul of equipment normally performed at a military depot or civilian manufacturer
- b. Sustaining Support: All the costs directly associated with system-specific specialty training activities in the Operations & Sustainment phase; the costs incurred to replace or repair support equipment associated with the primary system or its major subsystems at all levels of maintenance; The government and contractor sustaining engineering to ensure the operational reliability and conformance with established specifications; Management activities associated with the program; Software Maintenance Support; Maintaining and Updating of Data and Technical Publications.; Re-provisioning for the routine replenishment and PHST (Packaging, Handling, Storage and Transportation).
- c. Continuing System Improvements: Upgrade and additional operational capabilities that occur after deployment of a system. This activity is intended to improve the system's safety and reliability. It can also be intended to enable the system to meet its basic original operational requirements.

### 4. Operating Costs

All operating costs will be estimated by DND. The cost of fuel will be dependent on the burn rates provided in the CAP portion of the questionnaire.

### 5. Disposal Costs

Include the costs of demilitarizing the aircraft and removing hazardous materials. If no Supplier-specific disposal costs are provided, disposal costs will be presumed to be the same as for the CF-18.



Glossary

<u>Acronym</u>	<u>Description</u>
ACS	Aircraft Structures Technician
ADS-B	Automatic Dependent Surveillance - Broadcast
AESA	Active Electronically Scanning Array
ALSE	Aviation Life Support Equipment
AMSE	Aircraft Maintenance Support Equipment
ATFLIR	Advanced Targeting Forward Looking Infrared
AVN	Aviation Systems Technician
AVS	Avionic Systems Technician
AWS	Air Weapons Systems Technician
CAN/US	Canadian / United States
CIT	Combined Interrogator And Transponder
DND	Department Of National Defence
EO/IR	Electro-Optical / Infrared
GPS	Global Positioning System
HTS	Hydraulic Test Stand
ICAO	International Civil Aviation Organisation
IFF	Identification Friend or Foe
IP	Intellectual Property
ISS	In-Service Support
ITAR	US International Traffic In Arms
ITB	Industrial and Technological Benefits
LRC	Line Replaceable Components
LRU	Line Replaceable Units
MICA RF	Missile d’interception, de combat et d’autodéfense radio fréquence
MIDS JTRS	Multi-Functional Information Distribution System Joint Tactical Radio Systems
MSL	Mean Sea Level
NL	Newfoundland and Labrador
nm	Nautical Miles



Industry Consultation Questionnaire - CF-18 Replacement

NORAD	North American Aerospace Defense
NRE	Non-Recurring Engineering
NSA	National Security Agency
NT	North West Territories
NU	Nunavut
OEM	Original Equipment Manufacturer
OFP	Operational Flight Program
PHST	Packaging, Handling, Storage And Transportation
RCAF	Royal Canadian Air Force
RF	Radio Frequency
RF/IR	Radio Frequency / Infra-Red
RNAV	Radar Navigation
SAASM	Selective Access Anti-Spoofing Module
SATCOM	Satellite Communication
SIGINT	Signals Intelligence
URF	Unit-Recurring Flyaway
YFR	Yearly Flying Rate

Questionnaire

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
PROC-1	Method of Procurement	<p>a. Is the fighter aircraft weapon system and its associated In Service Support available through Foreign Military Sales (Government to Government) or Direct Commercial sales (industry) or through other means?</p> <p>b. Describe any action or approval required from your government prior to your company submitting a bid or signing a contract. List all government departments, agencies and other organizations involved, their role and the anticipated time frame for completing each step. Please provide any relevant documentation to support your response.</p> <p>c. Describe the constraints (if any) associated with your company submitting a bid to Canada through your government if this was a mandatory condition of being able to participate in the procurement process to replace Canada's CF-18 fighters? Please provide any relevant documentation to support your response.</p>		
PROC-1 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
PROC-1 (b)	Answer	•		
	Origin of Information	•		

Industry Consultation Questionnaire - CF-18 Replacement

	Identified Risks/ or Uncertainties	•		
PROC-1 (c)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
PROC-2	Government Authorization and Approval	<p>a. Does the fighter aircraft weapon system include any equipment, software or other information that may be subject to foreign export controls or restrictions, including US International Traffic in Arms (ITAR) controls? And if so, what is the anticipated process (include all significant steps) including timelines for each, to address those controls or restrictions, such as initiation of an export license, Government to Government transfer arrangement or others?</p> <p>b. What is the expected total duration of time from the date the formal bid solicitation is launched to the time your company can demonstrate that it has obtained all required authorisations and approvals to export to Canada the fighter aircraft weapon system including any equipment, software or other information? <i>Please provide any relevant documentation to support your response.</i></p>	This includes, for example, authorization or approval required to obtain five-eyes compatibility as well as two-eyes compatibility (Canada/US)	
PROC-2 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

PROC-2 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
PROC-3	Terms and Conditions	<p>a. Would your company have any issue with a competitive process under which some or all terms and conditions would not be pre-established under the solicitation document but would instead be negotiated with the preferred bidder prior to contract award? If so, please describe these issues and indicate opportunities to eliminate/mitigate risks. Attach any relevant documentation to support your position.</p> <p>b. Should Canada determine that it is in its best interest to solicit proposals for future fighter capability from Governments only, would your company be able to participate in such a process? If yes, please describe the overall approach that would be taken. If no, please describe in detail any barriers your company might face in a government-to-government procurement process that would limit participation.</p>	<p>Context: Bids submitted to Canada in an open bid solicitation process are typically subject to Canada's terms and conditions (see the links below for examples of Canada's current standard terms and conditions that could be included in any contract resulting from a bid solicitation. These terms and conditions are subject to change at Canada's sole discretion).</p> <p><i>General Conditions - Higher Complexity Goods</i></p> <p><a href="https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/3/2030/17">https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/3/2030/17</a></p> <p><i>General Conditions - Higher Complexity Services</i></p> <p><a href="https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/3/2035/16">https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/3/2035/16</a></p>	
PROC-3 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

PROC-3 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
PROC-4	Production and Fleet Profile	<div>a. Provide the aircraft's planned production capacity (minimum annual) from 2017 to 2030, the associated currently known production orders as well as the planned closure of the production line, including options to acquire additional aircraft after the original fleet order is fulfilled. Provide the lead time for delivery from placement of order. Describe important assumptions related to production capacity and flexibility in production planning and delivery.</div> <div>b. Provide a list of current customers operating your aircraft type, and the status of current customer deliveries.</div>	* The information required in PROC 4 is oriented towards understanding when Canada will be able to procure aircraft, possible buy profiles (aircraft/year), and any risks to on-time delivery of aircraft with the required capabilities.	
PROC-4 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
PROC-4 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
PROC-5	Possible barriers	<p>Are there any barriers to an ITB proposal including a value proposition forming part of a bid to Canada (either by your company or your government) and evaluated in the selection process? If so, please complete the following:</p> <p>a. Provide a clear description of those barriers and indicate opportunities to eliminate/mitigate risks. Attach any relevant documentation to support your position;</p> <p>b. In a government to government process, indicate if your company would be able to submit an ITB proposal through a complementary/side proposal to Canada at time of bid closing that would form part of the evaluation and selection. If yes, describe the approach, using experiences from other recent procurements as applicable. If not, indicate if your company would be able to negotiate ITB obligations directly with Canada prior to any contract award. Attach any relevant documentation to support your position.</p>		
PROC-5 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
PROC-5 (b)	Answer	•		

Industry Consultation Questionnaire - CF-18 Replacement

	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 1	Industrial Benefits – General Question	a. Will your company commit to the requirements of Canada’s Industrial and Technological Benefits (ITB) Policy as part of a possible CF-18 Replacement procurement process?	Further information on Canada’s ITB Policy can be found at <a href="http://www.ic.gc.ca/itb">www.ic.gc.ca/itb</a>	For Canada to determine suppliers’ ability and commitment to meet the requirements of the ITB Policy.
IB-1 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 2	Industrial Benefits – Direct Opportunities - Aircraft	<div>a. Please describe the role (if any) of Canadian suppliers currently supplying parts/equipment on your fighter aircraft? What is the current value of the work performed in Canada on an annual basis?</div> <div>b. Please describe the potential opportunities for Canadian companies to be integrated into the production supply chain of this aircraft? Could these opportunities extend to the global supply for future sales of this aircraft? Please explain.</div> <div>c. Are there future opportunities for Canadian companies to participate in the development of upgrades on the current aircraft and/or developmental opportunities related to a new version of the aircraft?</div>	<div>Description of roles should be limited to production of parts and equipment on aircraft currently in production.</div> <div>Provide name of company currently involved in the production of your solution, description of the work, and estimated value of work.</div>	For Canada to determine the current level of Canadian participation for the proposed platform and understand potential opportunities for Canadian industry to be integrated in the current aircraft or participate in future upgrades or development of a new version of a particular aircraft.
IB - 2 (a)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		
IB - 2 (b)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		
IB - 2 (c)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		



Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 3	Industrial Benefits – Direct Opportunities – In-Service Support	a. Canada has significant industrial capability to perform Line 1, 2, and 3 maintenance on military aircraft, including its existing fighter fleet. If Canada were to require that the future fighter fleet be supported domestically, what approach would your company take to maximize Canadian industry’s participation in the long term in-service support of a future fighter fleet across the ISS value chain activities defined in this document?  b. Please describe your approach to the transfer or provision of access to intellectual property (IP) and technical data to facilitate the support of the hardware and software of the solution.  c. What other ISS approaches should Canada consider to maximize industrial benefits for Canadian industry in this area?	Canada defines ISS value chain activities as follows:  <ul style="list-style-type: none"><li>• Sustaining engineering and management support</li><li>• Field level maintenance</li><li>• Engineering support services</li><li>• Electronic Information Environment/Information Management</li><li>• Intermediate level maintenance</li><li>• Depot-level maintenance</li><li>• Supply chain management</li><li>• Spare parts and other content</li><li>• Maintenance training including simulation</li><li>• Operator training including simulation</li><li>• System upgrades and modification</li></ul>	For Canada to understand work opportunities in Canada related to the In-Service Support (ISS) activities of a future fighter fleet.
IB - 3 (a)	Answer			
	Origin of Information			
	Identified Risks/ or Uncertainties			
IB - 3 b)	Answer			
	Origin of Information			
	Identified Risks/ or Uncertainties			
IB - 3 (c)	Answer			
	Origin of Information			

Industry Consultation Questionnaire - CF-18 Replacement

	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 4	Industrial Benefits – Supplier Development Opportunities	a. Please describe your approach to providing supplier development opportunities to Canadian industry? How do you propose to integrate Canadian-based companies, including Small and Medium Enterprises, in your supply chains?	Responses must include a description of the supplier development activity, economic sector (i.e. commercial aerospace, defence, space, cyber security, clean- tech etc.), and potential platform.  Examples of supplier development activities could include, but are not limited to, new mandates or work packages, growth in existing activities, mentoring and marketing support, work that raises suppliers up the value chain.	For Canada to understand supplier development opportunities across economic sectors.
IB-4 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 5	Industrial Benefits – Exports	a. Please describe your approach for providing long-term export commitments to Canada. Are there opportunities to establish a production or service Centre of Excellence in Canada? If so, in what sector?	A Centre of Excellence is defined as a Canadian company that has the authority to develop their own IP and technical data that can be marketed internationally.	For Canada to understand export opportunities available to Canadian industry across economic sectors.
IB-5 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB - 6	Industrial Benefits – Indirect Opportunities – R&D	a. In what sectors would you propose to undertake innovation and research and development activities in Canada as a result of this procurement? How do these activities align with your company’s core competencies? Please describe the role of Canadian industry and publicly-funded research institutes in these activities?	In responding to these questions, suppliers are encouraged to review the Government of Canada’s recently launched consultation process regarding its vision for building Canada as a global centre of innovation: <a href="http://news.gc.ca/web/article-en.do?nid=1084439">http://news.gc.ca/web/article-en.do?nid=1084439</a>	For Canada to understand potential areas of investments in innovation and research and development involving industry and publicly funded research institutes.
IB-6 (a)	Answer	•		

Industry Consultation Questionnaire - CF-18 Replacement

	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
IB-7	Industrial Benefits – General Question	a. Please describe how your approach to industrial benefits will differentiate you against other suppliers in generating long-term economic benefits to Canadian industry?	Please limit to one page.	For Canada to understand the suppliers comparative advantage with regards to potential industrial benefits.
IB-7 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
Cost-1	Inflation	a. Please provide expected yearly inflation rates from 2017-2061.	Please complete <i>Table 1: Expected Inflation Rates</i> in the Excel file provided.	For Canada to calculate nominal cash flows.
Cost-1 (a)	Answer	• Please complete <i>Table 1: Expected Inflation Rates</i> in the Excel file provided.		

Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
Cost-2	Payment Plan	<p>a. Please provide a proposed payment plan for the aircraft, based on percentage of unit-recurring flyaway (URF) cost. For example:</p> <ul style="list-style-type: none"><li>- 10% of URF due 1 year before the order date</li><li>- 30% of URF due in the year of order</li><li>- 30% of URF due in the year following the order</li><li>- 30% of URF due in the year of delivery (assumes delivery will occur two years from order date)</li></ul> <p>b. If the payment plan would differ based on the various YFR scenarios in question Cost-3, please provide alternative payment plans, specifying the aircraft quantity or for which each plan is valid.</p>	Please answer in the space provided below.	To phase acquisition cash flows.
Cost-2 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Cost-2 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
Cost-3	Life Cycle Costs	<p>a. Please provide life cycle cost estimates for the minimum amount of aircraft necessary to achieve the following yearly flying rates (YFRs) at steady-state (i.e. once all aircraft have been delivered), with each aircraft flying for a period of 10 years from delivery:</p> <ul style="list-style-type: none"><li>i. 3,600 YFR</li><li>ii. 5,400 YFR</li></ul>	<p>Please populate the life cycle costs in Tables 2 to 7 of the Excel file provided. Refer to the provided “General Assumptions and Description of Cost Elements” when populating the costs.</p> <p>The Excel tables have a space for the Supplier to provide the minimum number of aircraft required to meet each YFR, the proposed delivery and disposal</p>	For estimating life cycle costs and running sensitivity scenarios.

		<div>iii. 9,000 YFR</div> <div>b. Please provide life cycle cost estimates for the minimum amount of aircraft necessary to achieve the following yearly flying rates (YFRs) at steady-state (i.e. once all aircraft have been delivered), with each aircraft flying for a period of 30 years from delivery:<div>i. 12,000 YFR</div><div>ii. 14,000 YFR</div><div>iii. 16,000 YFR</div></div>	<div>schedules, and the forecasted YFR per year. The minimum number of aircraft should correspond to the certified service life of the aircraft as indicated in the response to question ISS-4(a). The delivery of aircraft should reflect the earliest delivery schedule possible. The disposal schedule should mirror the delivery schedule, assuming each aircraft will be disposed of immediately after 10 or 30 years of operations. Please also indicate the assumed serviceability and availability rates in the fields provided.</div> <div>The Excel tables also provide the desired cost breakdown structure. Suppliers are requested to fill in each table to the extent possible, in 2016 prices. No inflation is to be applied to these costs by the Supplier. To enable a full understanding of Supplier costs, Suppliers are asked to break down all costs into variable and fixed cost categories, in addition to entering a total cost for each calendar year. For variable costs, it is necessary for the Supplier to identify in the Variable Cost Driver column what the variable costs are dependent on. For example, whether the cost varies based on number of aircraft, number of flight hours, etc. Rows labelled “Other: Please Indicate” have been included in the tables for the Supplier to provide costs that were not explicitly requested, but which are relevant to capture total life cycle costs. The Supplier may replace the words “Other: Please Indicate” with the relevant name of the cost element. The Supplier may also add rows to the tables if additional space for cost elements is required.</div> <div>Please state any assumptions and additional details required to interpret the provided costs accurately in the “Additional Details &amp; Assumptions” column of the tables.</div>	
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Industry Consultation Questionnaire - CF-18 Replacement

Cost-3	Answer	• Please complete Tables 2 to 7 in the Excel file provided.		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
Cost-4	Learning Curve Effects & Cost Growth	<p>Please provide table(s) of learning curve effects and positive or negative cost growth effects that were assumed to be realized in the provided life cycle cost estimates.</p> <p>a. Cost growth effects are to be treated as changes in cost due to events other than learning curve effects or inflation.</p>	<p>Please provide the learning curve and cost growth effects on a per year basis over the life of the estimate, by applicable cost element, in the table format of the Supplier’s choosing. A template table has not been provided.</p> <p>In addition for cost growth effects, include a description of the effect (ex. due to changes in labour rates, software development, etc.).</p>	To understand how a Supplier’s costs evolve over time.
Cost-4 (a)	Answer	• In the table format of the Supplier’s choosing. A template table has not been provided.		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
CAP-1	Aircraft Performance	<p>- For the following series of questions, use actual aircraft configuration (utilize systems which are operational with Armed Services today only – non-developmental). Configuration to include:</p> <p>a. External Fuel Tanks – as required to meet profiles.</p> <p>b. All stores are retained until landing.</p> <p>c. 4 air-to-air missiles, with a minimum of two active RF medium range missiles (eg. AIM-120, MICA RF, etc).</p> <p>d. Infrared targeting system (eg. SNIPER, Damocles, ATFLIR, etc).</p> <p>e. Optimum climb, cruise altitudes and speeds (ICAO standard day, no wind).</p> <p>f. All launchers, racks and pylons as required</p>	<p>Expected answers in the format of</p> <p>Profile 1: 9 series of answers Profile 1a: 3 series of answers</p> <p>Profile 2: 9 series of answers Profile 2a: 3 series of answers</p> <p>Profile 3: 9 series of answers Profile 3a: 3 series of answers</p> <p>Flight profiles, altitudes, climbs and speeds are all to the optimum of the individual platform.</p>	For Canada to determine ability of the proposed platform to perform most basic and desired NORAD profiles.

		<ul style="list-style-type: none"><li>- <b>Profile 1: Goose Bay to Iqaluit</b><ul style="list-style-type: none"><li>a. Depart Goose Bay, NL (CYJR);</li><li>b. Transit to overhead destination, Iqaluit, NU (CYFB);</li><li>c. Continue to alternate Kuujuaq, NU (CYVP);</li><li>d. Hold 15min; and</li><li>e. Complete an approach, landing with dry tanks.</li></ul></li><li>- <b>Profile 1a: Dash from Iqaluit (using Profile 1 configuration)</b><ul style="list-style-type: none"><li>a. Depart Iqaluit, NT (CYEV);</li><li>b. Proceed 100nm North at 30,000’MSL at optimum range airspeed;</li><li>c. Accelerate to Mach X.XX and maintain for 10min (proceeding North);</li><li>d. Return to overhead Iqaluit at optimum altitude and airspeed;</li><li>e. Continue to alternate Kuujuaq, NU (CYVP);</li><li>f. Hold 15min; and</li><li>g. Complete an approach, landing with dry tanks.</li></ul></li><li>- <b>Profile 2: Cold Lake to Inuvik</b><ul style="list-style-type: none"><li>a. Depart Cold Lake, AB (CYOD);</li><li>b. Transit to overhead destination, Inuvik, NT (CYEV);</li><li>c. Continue to alternate Norman Wells, NT (CYVQ);</li><li>d. Hold 15min; and</li><li>e. Complete an approach, landing with dry tanks.</li></ul></li><li>- <b>Profile 2a: Dash from Inuvik (using Profile 2 configuration)</b><ul style="list-style-type: none"><li>a. Depart Inuvik, NT (CYEV);</li><li>b. Proceed 100nm North at 30,000’MSL at optimum range airspeed;</li><li>c. Accelerate to Mach X.XX and maintain for 10min (proceeding North);</li><li>d. Return to overhead Inuvik at optimum altitude and airspeed;</li><li>e. Continue to alternate Norman Wells, NT (CYVQ);</li><li>f. Hold 15min; and</li></ul></li></ul>		
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# Industry Consultation Questionnaire - CF-18 Replacement

		<ul style="list-style-type: none"> <li>g. Complete an approach, landing with dry tanks.</li> <li>- <b>Profile 3: Cold Lake to Inuvik</b> <ul style="list-style-type: none"> <li>a. Depart Cold Lake, AB (CYOD);</li> <li>b. Transit to overhead destination, Inuvik, NT (CYEV);</li> <li>c. Continue to alternate Eielson AFB, Alaska (PAEI);</li> <li>d. Hold 15min;</li> <li>e. Complete an approach, landing with dry tanks.</li> </ul> </li> <li>- <b>Profile 3a: Dash from Inuvik (using Profile 3 configuration)</b> <ul style="list-style-type: none"> <li>a. Depart Inuvik, NT (CYEV);</li> <li>b. Proceed 100nm North at 30,000' MSL at optimum range airspeed;</li> <li>c. Accelerate to Mach X.XX and maintain for 10min (proceeding North);</li> <li>d. Return to overhead Inuvik at optimum altitude and airspeed;</li> <li>e. Continue to alternate Eielson AFB, Alaska (PAEI);</li> <li>f. Hold 15min; and</li> <li>g. Complete an approach, landing with dry tanks.</li> </ul> </li> <li>- <b>Answer Profile 1,2 and 3 using the configuration used for respective, individual profiles.</b> <ol style="list-style-type: none"> <li>1. What aircraft configuration must you use to complete each profile (eg. external fuel tanks required, pylons, launchers, stationed used, etc) ?</li> <li>2. Provide flight data, fuel quantity used and fuel burn rates</li> <li>3. What is your normal and emergency braking distance if you elect to land at destination?</li> <li>4. What is your normal and emergency braking distance on landing at the alternate airport?</li> <li>5. Can your aircraft exceed this profile? If so, what is the additional distance your aircraft could fly on the first leg?</li> </ol> </li> </ul>		
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# Industry Consultation Questionnaire - CF-18 Replacement

		6. If your aircraft is unable to complete the profile, state the reduction in the distance of the first leg required to complete the profile. 7. What is the maximum altitude that you can sustain in this configuration 8. What is the maximum Mach Number that you can sustain in this configuration 9. What is your take off distance in this configuration  - <b>Answer Profile 1a, 2a and 3a (Dash Profiles) using the configuration used in their respective Profiles 1, 2 or 3.</b>  1. State the maximum Indicated Mach Number (Mach X.XX) your aircraft can maintain in the dash sequence to achieve the profile. 2. If your aircraft is unable to complete the profile, state the reduction in the distance of the 100nm leg required to complete the profile, and the ensuing Mach number. 3. Provide flight data, fuel quantity used and fuel burn rates		
CAP-1	Answer	<ul style="list-style-type: none"> <li>Please complete CAP Answers tab in Excel file provided.</li> </ul>		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
CAP-2	Minimum Equipment List (MEL)	List available mission systems of following type: a. AESA Radar. (Multi Role, Multi Mission, Electronic Attack); b. Offensive/Defensive systems: integrated jammers (internal or podded) including towed decoys (if available); c. Hardened Cyber Counter Measure Systems RF/IR countermeasures systems; d. Radar Warning Receivers, Missile Warning		For Canada to understand the aircraft system of the proposed platform.

Industry Consultation Questionnaire - CF-18 Replacement

		<div>Receivers (if available);</div> <div>e. EO/IR Targeting systems (internal or podded);</div> <div>f. SATCOM (internal or podded);</div> <div>g. ADS-B, RNAV, CIT (Mode 5 and S); (navigation standards)</div> <div>h. Link 16: MIDS JTRS compliant; and</div> <div>i. Fighter to Fighter discreet data link (if available).</div>		
CAP-2 (a)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		
CAP-2 (b)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		
CAP-2 (c)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		
CAP-2 (d)	Answer	<div></div>		
	Origin of Information	<div></div>		
	Identified Risks/ or Uncertainties	<div></div>		

Industry Consultation Questionnaire - CF-18 Replacement

CAP-2 (e)	Answer	•
	Origin of Information	•
	Identified Risks/ or Uncertainties	•
CAP-2 (f)	Answer	•
	Origin of Information	•
	Identified Risks/ or Uncertainties	•
CAP-2 (g)	Answer	•
	Origin of Information	•
	Identified Risks/ or Uncertainties	•
CAP-2 (h)	Answer	•
	Origin of Information	•
	Identified Risks/ or Uncertainties	•
CAP-2 (i)	Answer	•
	Origin of Information	•
	Identified Risks/ or Uncertainties	•
CAP-2 (j)	Answer	•
	Origin of Information	•

Industry Consultation Questionnaire - CF-18 Replacement

	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
CAP-3	Interoperability	a. State how your aircraft is seamlessly interoperable with the following US Air Force assets including Air Refuelling assets a. F-15C, F-16C, F22A, KC-135 b. Is your aircraft's datalink system currently compatible with the following US Air Force fighter aircraft: a. F-15C, F-16C, F-22A	- Provide details, description of equipment use and level of information passage (transmit and receive) of current systems use on proposed platform that is compatible with NORAD fighter platforms.	For Canada to understand the most basic level of Interoperability with other NORAD fighter platforms
CAP-3 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
CAP-3 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		

Industry Consultation Questionnaire - CF-18 Replacement

Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
CAP-4	Security	<div>a. Integration - Ability to integrate 2-Eyes (CAN/US) and 5-Eyes intelligence mission data into aircraft mission equipment.</div> <div>b. Please explain how NSA-controlled Type 1 encryption; NSA-controlled SIGINT payloads; SAASM GPS: Link 16; Mode 4 and/or Mode 5 IFF; and other ITAR controlled equipment would be integrated into the proposed platform.</div> <div>c. What would be the potential restrictions, if any, that would be placed on the production, integration, and operation and/or sustainment of these sub-systems?</div>	<div>- Provide details on the process required to integrate 2-Eyes and/or 5-Eyes mission data and cryptography. This should include the process and timelines for US Government approvals, the required supply-chain integrity and integration, and special maintenance and handling requirements while in service.</div>	For Canada to understand the level of interoperability (with the US) available within the platform, and/or the necessary modifications, cost and time to reach interoperability. Implications to service and support may indicate requirement for special procedures and/or handling.
CAP-4 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
CAP-4 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
CAP-4 (c)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required

Industry Consultation Questionnaire - CF-18 Replacement

CAP-5	Growth Potential	<p>In regards to the current proposed platform upgrade plans, please provide information on the:</p> <p>a. Funded avionics, offensive and defensive systems upgrades;</p> <p>b. Planned, but currently unfunded avionics, offensive and defensive systems upgrades; and</p> <p>c. Planned structural program work and the expected benefits this program will have on the aircraft service life.</p>		For Canada to understand the growth potential of the aircraft and its associated funding status.
CAP-5 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
CAP-5 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
CAP-5 (c)	Answer	•		

Industry Consultation Questionnaire - CF-18 Replacement

	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-1	Infrastructure	a. Identify what is required to support aircraft maintenance activities in a generic hangar facility.	<div>- Provide details on the following (note: if the aircraft has a folding wing capability, information must be provided for both folding and fully extended wing positions):<ul style="list-style-type: none"><li>• Required floor space dimension for one aircraft including recommended safety distances</li><li>• Minimum doorway width and height including recommended safety clearances</li><li>• Minimum ceiling height, including recommended safety clearance</li><li>• High voltage mains electrical ground power (voltage and frequency) requirements</li><li>• Aircraft ground cooling requirements</li><li>• Any other ground requirement</li></ul></div>	For Canada to determine impact on existing Canadian infrastructure. Data / info provided will be used primarily to identify any cost of modifying existing infrastructure or establish new ones (ex: hangar capacity, electrical / cooling requirement, special access facility, etc.).
		<div>b. If 2<sup>nd</sup> line (I Level) maintenance facilities are deemed required to support the proposed platform, describe the minimum infrastructure requirements. (Note: Canada will only establish I Level facilities that are deemed necessary to support deployed operations).</div> <div>c. Identify if the proposed platform requires the use of a special access facility? If so, provide unclassified infrastructure requirements.</div>	<div>- The Canadian maintenance support concept is designed using a 1st (O Level) to 3rd (Depot Level) maintenance approach with limited 2nd (I Level). The majority of on-aircraft maintenance will be done at the O Level and will consist of the replacement of Line Replaceable Components (LRC)/Line Replaceable Units (LRU) and the return of unserviceable items to the supply chain.</div> <div>- A special access facility is a certified and accredited space (i.e., area, room, group of rooms, buildings, or installation) where special access program information may be stored, used, discussed, and/or</div>	For Canada to determine secured infrastructure needs to support the proposed platform.



Industry Consultation Questionnaire - CF-18 Replacement

		<div>d. Specify the space required to enclose 4 fully functional tactical operational flight trainers (simulators).</div> <div>e. Are there any other infrastructure items which have not been identified in the previous questions which should be considered in the implementation of the infrastructure solution? If so, what are their size requirements?</div>	<div>electronically processed. Special access facilities will be afforded personnel access control to preclude entry by unauthorized personnel. The physical security protection for a special access facility is intended to prevent as well as detect visual, acoustical, technical, and physical access by unauthorized persons.</div>	
ISS-1 (a)	Answer	<div>•</div>		
	Origin of Information	<div>•</div>		
	Identified Risks/ or Uncertainties	<div>•</div>		
ISS-1 (b)	Answer	<div>•</div>		
	Origin of Information	<div>•</div>		
	Identified Risks/ or Uncertainties	<div>•</div>		
ISS-1 (c)	Answer	<div>•</div>		
	Origin of Information	<div>•</div>		

Industry Consultation Questionnaire - CF-18 Replacement

	Identified Risks/ or Uncertainties	•		
ISS-1 (d)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
ISS-1 (e)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-2	Maintenance Support	<p>a. What is the total maintenance man-hours per flying hour for the proposed platform?</p> <p>b. What are the preventative maintenance tasks (with their intervals) required to fly 1000 hours of the proposed platform?</p>	<ul style="list-style-type: none"><li>- Breakdown the total into preventive and corrective maintenance man-hours per flying hour.</li><li>- Breakdown the total into 1<sup>st</sup> line (O level) and 2<sup>nd</sup> line (I level) maintenance man-hours per flying hour.</li><li>- Breakdown the total into the following major aircraft systems: airframe, environmental control system, structure, propulsion, radar, navigation, communication, EW / self-protection, weapon, and safety system.</li><li>- Provide evidence of Design vs Achieved Performance and clearly describe the associated context (user, operating environment, etc.)</li></ul> <p>- Provide the associated level of effort for each preventive maintenance task.</p>	For Canada to understand the associated maintenance level of effort in order to determine the required manning levels by trade.

Industry Consultation Questionnaire - CF-18 Replacement

ISS-2 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
ISS-2 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-3	Maintenance Support	a. Does a mission software maintenance solution exist for Operational Flight Program (OFP).	- Provide details on the proposed mission software maintenance support concept. Provide details including location, potential partnerships.	For Canada to determine if common solution exists regarding aircraft software .
ISS-3 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-4	Maintenance Support	a. What is the certified service life of the proposed platform? b. Is there an associated depot level structural program (modifications/updates/major inspections) necessary to fly to the certified structural life, and if so, is this program included within the unit cost of the platform?	- Provide standard to which the platform was certified and to which usage spectrum.	For Canada to understand the usable service life (affecting determination of fleet size) of the proposed platform and the possible follow-on work that would be required to achieve the full service life.

Industry Consultation Questionnaire - CF-18 Replacement

ISS-4 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
ISS-4 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-5	Maintenance Support	a. List the major Aircraft Maintenance Support Equipment (AMSE) / speciality tools / system test sets or test equipment that is currently certified for use on the proposed platform and the recommended quantity per 12 aircraft.	- The list of major AMSE should include as a minimum:  • Hydraulic Test Stand (HTS) • Electrical / Power unit • Engine Removal & Installation trailer /stand • Aircraft jacks • Ground cooling station / mobile air conditioner	For Canada to identify the support equipment requirements to maintain the proposed platform. Provide the required data to perform an analysis to evaluate the amount of AMSE / test equipment that we could retain from our CF-18 fleet and the quantity that we will have to be procured.
ISS-5 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-6	Material Support	a. Does the OEM have plans in place to manage	- Briefly describe the OEM's plan to deal with	For Canada to determine and understand long term

Industry Consultation Questionnaire - CF-18 Replacement

		obsolescence for major aircraft systems, components, parts and piece-parts for all the aircraft systems including training devices (mission and technician training simulators)? b. Does the OEM have a strategy to manage diminishing manufacturing sources for major systems including flight controls, mechanical systems and avionics?	obsolescence management and diminishing manufacturing sources to support the fleet.	supportability of the platform. Provide the information required to evaluate the quantity of spares that Canada will have to procure up front in order to maintain the aircraft over its lifetime.			
ISS-6 (a)	Answer						
	Origin of Information						
	Identified Risks/ or Uncertainties						
ISS-6 (b)	Answer						
	Origin of Information						
	Identified Risks/ or Uncertainties						
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required			
ISS-7	Weapon System Management	a. List the air-to-air and air-to-ground weapons that are currently certified for use on the proposed platform?	- Supplier could also list weapons that are pending clearance and the level of effort left to complete the task.	For Canada to determine which weapons from existing inventory are cleared on the proposed platform and understand the weapon certification level of effort.  Provide data to evaluate if we will need to modify our current ammunition inventory. Also, if we need to clear specific weapons, it will dictate the level of effort (including timing and cost) required to accomplish this task.			
ISS-7 (a)	Answer						

Industry Consultation Questionnaire - CF-18 Replacement

	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
Serial #	Area of Analysis	Question	Instructions / Comments	Information Required
ISS-8	Training Program Support	<p>a. Does an OEM-level training solution exist to provide initial cadre training to achieve maintenance release for the work? If, so, please provide course detail, duration, capacity and throughput. If training is available, are there conditions or resources that Canada must meet such as providing RCAF aircraft /simulators and Canadian instructor personnel? Also, please advise if there are any other limitations to the delivery of training to Canada.</p> <p>b. Other training that Canada is seeking includes Transition, and Continuation Training. If this training is available through the OEM, please provide details.</p>	<p>For information purposes, Canada’s aviation trades perform the following tasks.</p> <ul style="list-style-type: none"><li>- Avionic Systems Technician (AVS): AVS are responsible for maintaining all electronic systems onboard Forces’ aircraft. The primary responsibilities of Avionics Systems Technicians are to: Carry out performance tests, preventive/ corrective maintenance, and calibration of the following systems and their associated components: aircraft communication, radar, infra-red system, electronic warfare, navigation, compass, and flight control systems.</li><li>- Aviation Systems Technician (AVN): AVN handle, service, and maintain Forces aircraft, ground equipment and associated support facilities. AVN are responsible for the maintenance of aircraft aviation systems including propulsion, airframe, basic electrical, and their related components.</li><li>- Air Weapons Systems Technician (AWS): AWS maintain aircraft air weapons systems including loading and unloading of weapons. They also perform explosives storage, handling, and provide Explosive Ordnance Disposal duties for the Air Force.</li><li>- Aircraft Structures Technician (ACS): ACS are members of the air maintenance team who handle, service, and maintain Forces’ aircraft and associated equipment. They are responsible for the maintenance and repair of aviation life support equipment, aircraft structures and related components. Aircraft Structures Technicians are</li></ul>	For Canada to understand the training solutions available and the associated training needs for Canadian Forces technicians.

Industry Consultation Questionnaire - CF-18 Replacement

			skilled in metal and composite repair, refinishing, painting, machining and welding.	
ISS-8 (a)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		
ISS-8 (b)	Answer	•		
	Origin of Information	•		
	Identified Risks/ or Uncertainties	•		