Annex A

Concept of Support Document

Royal Canadian Navy

Intelligence, Surveillance, Target Acquisition and Reconnaissance Unmanned Aircraft System

(RCN ISTAR UAS)

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1.0 Introduction

The primary purpose of this document is to provide industry a high-level overview of the support strategy envisaged for the Royal Canadian Navy – Intelligence, Surveillance, Target Acquisition and Reconnaissance Unmanned Aircraft System (RCN ISTAR UAS) and initiate consultations with industry to develop the sustainment strategy necessary to support and sustain the capability for the life of the *Halifax*-class ships (i.e. up to 2040s).

The Industry engagement must therefore not only facilitate the project team to develop the requirements for the acquisition project, it must also enable the project team to identify the in-service support environment and infrastructure needed to support and sustain the capability. This includes obtaining industry feedback on the following ISS elements:

a. Obsolescence management plan (i.e. air frame replacement/life extension, tech refresh, payload life extension plan…etc.);
b. Division of ISS scope (i.e. in-house vs contracted ISS work);
c. UAS Serviceability Characteristics (i.e. Availability, Serviceability, Reliability, Maintainability …etc) and
d. Indicative cost estimates for both acquisition and a twenty plus (20+) years in-service support / sustainment.

1.1. Project Scope

The objective of Royal Canadian Navy – Intelligence, Surveillance, Target Acquisition and Reconnaissance Unmanned Aircraft System (RCN ISTAR UAS), Project Management Office (PMO) is to procure a fleet of six (6) Unmanned Aircraft System (UAS), and eight (8) additional command systems (i.e. Ground Control Stations) and setup the In-Service Support (ISS) solution required for the long-term sustainment and support of the fleet. The UAS would be owned and operated by the RCN, and the associated expertise and knowledge would be built within the RCN. RCN ISTAR UAS will enhance the Canadian Armed Forces (CAF) existing command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) capabilities for domestic and international operations.

The ISS solution will encompass a broad range of services and sustainment activities assigned to industry. Generally, deployed and limited domestic ISS will be provided by the CAF/DND in-house capabilities and resources, with industry providing long term in-depth and augmenting support and training. The DND Equipment Management Team (EMT) will coordinate the programme management activities including tracking and analyzing relevant contractor performance data related to usage and support activities.

The RCN *Halifax*-class frigates require a dedicated unmanned aircraft capability until their retirement in 2040(+). Therefore, the estimated life expectancy for the RCN ISTAR UAS capability will be for 15 - 20 years and consequently, the ISS must include long-term supportability. As the systems age, technology matures and components attrite, the RCN will investigate mid-life upgrades or the new purchase of replacement systems. The Department of National Defence (DND) will be responsible for overall fleet management.

2.0 System description

The RCN ISTAR UAS will be a low to medium altitude system. It will use a vertical takeoff and landing (VTOL) system negating the requirement for a runway, rail launch or recovery hook systems thereby requiring a minimal support equipment footprint. It will use a Commercial Off-the-Shelf (COTS) proven design that is in service with NATO, Australian or New Zealand military, paramilitary or civilian organizations with similar roles and requirements to the RCN and is compliant with current air regulations.

The RCN ISTAR UAS will be used as a complementary air asset to the *Halifax*-class ship's embarked CH148 Cyclone maritime helicopter. When reference is made to the Unmanned Aircraft System, it includes the following components:

a. Two vertical take-off and landing (VTOL) Unmanned Aircraft (UA),
b. All applicable ISTAR sensor payloads;
c. Two Ground Control Stations (GCS) for control of the UAV and sensor payloads;
d. Ship-mounted or ground portable antenna or antenna array;
e. A datalink system;
f. Automated Takeoff and Landing system; and
g. Maintenance, testing and support equipment.

Of the six (6) systems, four (4) will be assigned to *Halifax*-class frigates and two (2) will be shore-based to be used for training and to respond to domestic disaster operations on an as needed basis. All 12 *Halifax*-class ships will be fitted with the required infrastructure (control stations and antennae) installed onboard to support rapid integration of the UAS to other ships based on operational requirements. The two shore-based UAS, aside from supporting training and currency, will need to be deployable to support land and maritime domestic disaster response.

RCN ISTAR UAS will use a Line-of-Sight (LOS) Command and Control (C2) and payload data link system with connectivity ranges of at least 50NM from a Ground Control Station (GCS) with surveillance out to 80NM. Take-off and landing will be automated with Air Vehicle Operator (AVO) override capability. The GCS supports the

passing of control of the UA and/or payload operations from one GCS to another and/or transferring of data link control.

2.1. Operating and Support Environments

The *Halifax*-class frigates will be deployed worldwide, independently or as part of a Task Group to provide ISTAR support to Domestic Sovereignty Patrols, Assistance to Other Government Departments, Maritime Interdiction Operations, Maritime Counter-terrorism Operations; Maritime Domain Awareness (MDA), Embargo Operations, and Humanitarian Assistance and Disaster Relief. International deployment duration can vary from 6-9 months. Domestic deployments durations vary but can extend up to 60-days.

The UAS will be expected to operate day and night in most weather conditions within a maritime environment (salt spray and high humidity.) The RCN ISTAR UAS fleet will have a combined yearly flying rate (YFR) of 6,000 hours. Each UAS will fly 1,000 hours annually (500 hours per UAV). The UAS Detachment shall be available to conduct a minimum of one mission per 12-hour period, with the expectation that during high tempo operations the UAS shall conduct a minimum of three missions per 24-hour period. A mission is defined as one sortie operating out to at least 50NM from the GCS, with a minimum duration of six hours including a minimum of four hours of UA mission on-station time.

Ship-based operations of the UAS must be accommodated within the existing space of the *Halifax*-class frigate. ISS solution must also integrate with the Canadian Forces Supply System and synchronize support to the ship/task group port call schedule for resupply of parts and maintenance support.

Land-based UAS must be sea, land and air portable to respond to domestic disaster operations. Land and air storage and mobility requirements call for 20’ or 40’ ISO standard containers.

3.0 Maintenance and Support Requirements Summary

The service life of the UAS will be through to the predicted end-of-service life of the *Halifax*-class ships in 2040(+), meaning that the unmanned aircrafts are intended to be employed until that date. Within that service life, some sub-systems and components of the UAS will need to be replaced to ensure the system’s continues to meet operational needs and remains sustainable. The predicted life expectancy (ELE) of the UA airframe is 8 -10 years. Any procurement and sustainment of replacement airframes, control stations, antennae, and spares outside of the 2yr spares as acquired by the acquisition project, will be through DND funded sustainment project. The sustainment solution must

have built-in contractual mechanism to replenish stock as they are consumed at sea or become beyond economically repairable.

The objective of the ISSC is to ensure that the equipment delivered under the RCN ISTAR acquisition project continues to achieve the intended performance capability while continuously optimizing the resources applied to support it. The Contractor must have appropriate supply chain/material management capacity to perform forecasting, warehousing, and distribution of required parts to meet the state availability, serviceability, and reliability requirement IAW the requirements of the Airworthiness Clearance. All required material and spares must be available and accessible in a timely manner. The Contractor must ensure appropriate critical mission equipment sparing levels are in place to support operations and training.

The Contractor must have appropriate Maintenance Program including technical publication, Intellectual Property data, resource, infrastructure and expertise required to support 1st, 2nd, & 3rd line maintenance, free flow repairs, and overhauls.

Contractor must also be able to pre-position required spare and support equipment to support deployment requirements for domestic and international operations. This includes access to OEM FSR to support pre-installation, installation, and trials onboard *Halifax*-Class ships.

The following definitions are provided to clarify the stated requirements above:

a. **Availability**. The delivery and DND acceptance of fully functional UAS, and associated system elements after completion of repair & overhaul at ship or shore-based installation sites for shipboard installation and deployment. The RCN requires UAS fleet availability to support concurrent deployment and sustainment of two naval task groups, including being able to support RCN training and respond to domestic emergencies in support of civilian authorities. The Contractor must support this effort by enabling the RCN to deploy a minimum of two serviceable UAS to support task groups and at least one serviceable UAS for domestic emergencies on a 24-hour continuous basis.

b. **Serviceability**. The percentage of time a system or system elements are in a state of being able to perform its intended function under stated conditions without failures requiring maintenance beyond Level 1 repair. The Contractor must enable the UAS to achieve the required serviceability rate so as to enable RCN to conduct a minimum of one mission per 12-hour period, with the expectation that during high tempo operations the UAS must conduct a minimum of two missions per 24-hour period. A mission is defined as one sortie with a minimum duration of six hours.

c. **Reliability.** The ability of the UAS and associated system elements to perform its required function for the duration of a specified mission profile (i.e. the system, system elements will not fail to complete the missions assigned.) Reliability rate will be assessed against the use profile of minimum one mission per 12-hour period, with the expectation that during high tempo operations the UAS will conduct a minimum of two missions per 24-hour period.

d. **Maintainability**. The inherent property of the UAS and associated system elements to enable successful repair in a timely and economical manner to restore it to operational status after a failure occurs. Maintainability will be assessed against costs and repair turn-around time for all 1st and limited 2nd level maintenance conducted on deployed ships. A combination of maintenance services from the Contractor, RCN maintenance personnel and In-house maintenance facility (i.e. FMF, ISSC) will support maintenance of the UAS.

4.0 Support Strategy

The support strategy for the RCN ISTAR UAS capability is to have the UAS and associated equipment supported by a combination of:

a. CAF/DND in-house capabilities (e.g. maintenance by ship staff and coastal FMFs),
b. Industry personnel on-site at shore-based RCN bases in Halifax and Esquimalt; and
c. Industry Field Service Representatives available for domestic and international deployed operations.

The final support concept of the UAS will take into considerations responses to phased Industry engagement plan. The Contract Period will be defined following further internal and industry consultations.

The Prime Contractor/OEM will be primarily responsible for supply support under the ISS Contract. The supply support functions required for UAS deployed operations will often be complex and challenging given materiel must be available to support the operational tempo of up to two naval task groups at sea and support to domestic operations.

4.1. Division of Work for ISS (in-house vs. contracted)

For RCN ISTAR, 1st and limited 2nd Level maintenance will be the responsibility of in-house government resources. The ISS Contractor will be responsible for the remaining 2nd Level and all 3rd Level maintenance requirements, both ashore and on deployments. To fulfill DND Airworthiness requirements, all Contractor maintenance and support

organizations must be designated DND Technical Airworthiness Authority acceptable organizations. Maintenance and repair facilities will need to be accredited as DND Acceptable Maintenance Organizations (AMO), Acceptable Design Organizations (ADO) and Acceptable Materiel Support Organizations (AMSO).

The Equipment Management Team (EMT) will coordinate the programme management activities including tracking and analyzing relevant Contractor performance data related to usage and maintenance to ensure that UAS operational requirements are met and maintained throughout the life of the ISSC.

4.2. DND Responsibilities

It is expected that DND will be responsible for:

a. DND/CAF Airworthiness Program including Technical and Operational Airworthiness Programs;

b. As the Type Certificate Holder (TCH) and Technical Authority (TA) of Canadian UAS, DND will be responsible for the overall Weapon System leadership and management as described in the DND Technical Airworthiness Manual including the Continuing Airworthiness of the UAS;

c. Management, control and performance of first level maintenance of UAS;

d. Management, control and performance of approved second level maintenance of the UAS;

e. Management of the ISS Contract to ensure effective and timely logistics support for ship-based and shore-based operations both domestic and international;

f. Final approval authority with respect to weapon system management of the UAS, including: approval of the configuration, special inspection definition and implementation, and control of modification implementation;

g. Establishment, management, supervision and employment of DND Human Resources (HR) to meet UAS support requirements intended to be supported by DND;

h. The safety of CAF personnel operating, maintaining or otherwise supporting the UAS fleet;

i. Liaison with the Prime Contractor/OEM Field Service Representatives, Materiel Support Staff, etc. for domestic or international operations;

j. Monitoring of the UAS support program to ensure that it complies with laws established to protect the natural environment thus meeting/exceeding federal regulations while striving to satisfy provincial/municipal requirements;

k. Management, modification or construction of DND owned infrastructure to support UAS operations;

l. Provide fleet usage and maintenance data to the Prime Contractor or OEM in as close to real-time as operationally permissible;

m. Provision of Aircraft Vehicle Operator and Payload Operator training once Contractor provided training has allowed the RCN to reach steady state for operators and instructors; and

n. 1st and limited 2nd Level maintenance, ashore and at sea, as approved by the DND Technical and Operational Airworthiness Authorities and in accordance with Contractor/OEM maintenance processes.

4.3. PRIME CONTRACTOR Responsibilities

It is expected that the prime contractor will be required to provide support and management services for the UAS during its life cycle while achieving specified performance objectives. While covered in more detail in the ISS Contract, in general, the prime contractor will be responsible for:

a. Provision of ISS programme management, which includes project management activities, contract management, airworthiness certification as a Accredited Maintenance Organization facility. As a part of the management activities, the Prime Contractor will be responsible for the development, analysis, and submission of information related to activities including technical problem management, quality system, environment management, interface agreements, reports, schedules, budgets, meetings minutes and agendas;

b. Engineering Services associated with the RCN ISTAR ISSC including system engineering activities and design agent/payload integration. The Prime Contractor will also provide engineering support to WSM personnel including execution of assigned levels of engineering for the UAS;

c. Data and Configuration Management, to include, technical data, data management, configuration management and intellectual property rights;

d. Support Equipment provided by the OEM or sub-contractor to include standard and custom support test/measurement equipment and handling equipment;

e. Supply Support to include initial pack-up kits/deployment kits, spare parts, consumable and sustainment spares and supply chain management;

f. Steady State Maintenance training to include providing of qualified instructors, training equipment, courseware management, and OEM infrastructure as required;

g. Maintenance Support to include technical support to RCN maintenance personnel, 2nd and 3rd level maintenance activities and repair and overhaul, Field Support Representatives for training and domestic operations and support to international deployments;

h. System Upgrades/Obsolescence Management to include software upgrades, hardware upgrade, technology refresh and UAV upgrade. These activities do not cover those UAS configuration or modifications that arise from DND initiated changes.

In addition to the above responsibilities, the Prime Contractor will also be responsible for advising DND of all relevant special inspections, maintenance procedures and UAS modifications required to maintain the Airworthiness Certification of the UAS.

4.4. Maintenance Concepts and Principles

The UAS Maintenance Program will be developed by the Prime Contractor/OEM, approved by DND through the Airworthiness Process. Since the RCN ISTAR UAS will be a COTS system and already possess a valid airworthiness certification from a recognized national airworthiness authority, it is expected that the OEM maintenance program will meet DND requirements.

The maintenance program will reflect DND technical and operational airworthiness regulations, and DND support maintenance policies while functioning within the limitations imposed by the maintenance and operating environment. DND will maintain an oversight program to continually assess and validate that the in-service support is effective in maintaining the integrity of the UAS and the airworthiness certificate. It is understood that the maintenance program will evolve over the life of the UAS fleet in response to modifications, system obsolescence, and air maintenance regulatory changes.

The Maintenance Program will consist of a combination of DND and Prime Contractor/OEM capabilities, which together will function to deliver the operational requirements. The Maintenance Program will exploit OEM efficiencies to provide maintenance enablers while maximizing the effectiveness and flexibility assured by

DND maintenance capability. It is anticipated that the UAS will have three levels of maintenance reflective of the RCAF level as follows:

a. Level One (1st Level). This is maintenance directly concerned with preparing UAS for operations and keeping the system in a serviceable state. The depth of maintenance at this level normally includes all servicing and corrective/preventive maintenance that can be accomplished without major disassembly. Tasks will generally include but not limited to carrying out: replenishment of consumables, minor preventive maintenance inspections, replacement of assemblies or components and functional testing;

b. Level Two (2nd Level). UAS maintenance activities at this level include: major preventive maintenance inspections, structural repairs and modification embodiment. Component level maintenance activities include: repair/ replacement of parts, embodiment of modifications and shop level preventive and special inspections; and

c. Level Three (3rd Level). Third level usually involves prolonged downtime and is more complex than 1st and 2nd levels of maintenance. This level of maintenance encompasses more extensive activities such as replacement or restoration of major parts, assemblies or components, rebuilding and overhaul of equipment, mid-life improvements, life extension programs and more lengthy activities that require specialized facilities beyond those normally available at a wing.

What constitutes the specific levels of maintenance will be dictated by the OEM maintenance procedures and will be adapted by DND during the airworthiness process.

RCN will be responsible for 1st and limited 2nd level maintenance as dictated by the OEM and Airworthiness Authority. The Contractor/OEM will perform second level maintenance not performed by DND. In addition, the Contractor/OEM or the authorized sub-contractors will perform third level maintenance as defined in their process manual. DND will retain the integral and close support maintenance capability to enable the RCN to deploy the UAS anywhere in the world, under any threat level, and within short notice. For the first two (2) years, Contractor/OEM will provide FSR support as required to oversee first and second line maintenance until RCN technicians are adequately trained to perform the authorized maintenance activities. The Contractor/OEM will perform some second level and all third level maintenance.

4.5. Key Maintenance Principles

The maintenance program will be tailored to meet the following concepts in its design and implementation:

a. RCN personnel will be trained, qualified and assigned technical airworthiness authorizations by DGAEPM and the Airworthiness Authority (AA). For the

initial cadre of trained personnel to perform first and limited second level maintenance activities, DGAEPM will develop these authorizations to the DND airworthiness program;

b. Initial level of spares required for up-front buy as part of the Acquisition portion of the contract will be negotiated at contract award. The establishment of the level of spares required for the ISSC will be established between DND and the Prime Contractor/OEM.

c. The Prime Contractor/OEM will provide initial Pack up Kit (PUK) through the ISS contract to increase the level of spares required in order to support the first two (2) deployed operations;

d. DND must retain a 1st and limited 2nd level repair capability, which can rapidly achieve effective maintenance on the UAS domestic and deployed operations;

e. Prime Contractor/OEM may be required to provide FSR to augment DND maintenance organizations in the performance of support tasks. They may be required to provide specific FSR expertise at sea in an elevated threat environment outside Canada;

f. DND will retain the option and a capability to conduct internal technical investigation for all technical issues pertaining to the UAS. The intent remains for Prime Contractor/OEM to conduct all technical investigations and provide recommendations;

g. UAS work performed by RCN maintenance organizations will be captured within DND information systems (DRMIS). UAS maintenance performed at Prime Contractor/OEM maintenance organizations will be captured within Prime Contractor/OEM maintenance management information systems and provided to DND in order to be captured in DRMIS;

h. Spare parts will be provided by the Prime Contractor/OEM under the ISS contract. These spare parts will be available in sufficient quantities to support UAS operational tempo as previously stated in this document; and

i. The UAS maintenance capability will be required to operate from *Halifax*-class frigates deployed globally from Halifax or Esquimalt or on land or at sea for domestic disaster response missions.

5.0 UAS SUPPLY SUPPORT PROGRAM

The Prime Contractor/OEM will be primarily responsible for supply support under the ISSC. The supply support functions required for UAS deployed operations will often be complex and challenging given materiel must be available to support the operational tempo of up to two naval task groups at sea, in international theatres and one domestic deployment.

The fundamental characteristic of UAS ship-based operations is the necessity to deliver service 24/7, 365 days a year at sea. In recognition of primacy of support to military operations and the need to provide a flexible and dependable level of service, DND intends to capitalize upon best commercial practices and the established Canadian Forces Supply System (CFSS) in the execution of supply support.

5.1. Supply Support Management and Responsibilities

Supply support for the UAS fleet will be provided by a combination of the Prime Contractor/OEM and DND. The Prime Contractor will be the default source for all UAS spares, unique consumables, and STE throughout the UAS in-service life. The Prime Contractor will be responsible for Supply Chain Management (SCM) up to and including delivery of the UAS materiel to Canadian Forces Supply Depot. Once the parts are in DND possession the CFSS will be the responsible organization.

5.2. Supply Support Management

DND will receive an initial inventory of UAS spares and unique consumables under the acquisition contract which will be DND-owned and managed. DND will be responsible for inventory management, scaling, procurement, obsolescence management, distribution and disposal activities of UAS spares and unique consumables.

5.3. Contractor Supply Support Responsibilities

In the case of UAS spares and unique consumables, the Prime Contractor/OEM will supply parts using a coordinated SCM structure and distribution system throughout the UAS in-service life. The Prime Contractor's responsibilities with respect to supply support include, but are not limited to, the following:

a. Warehousing and materiel movement within industry to/from Canadian Forces Supply Depot (CFSD);

b. Provisioning of spares and consumables in the supply chain to support 1st and 2nd level maintenance, including sub-contracting arrangements for the R&O and support spares; and

c. Supplying and replenishing of PUKs.

5.4. DND Supply Support Responsibilities

DND will put in place measures to ensure that the UAS spares and unique consumables are not used on other DND fleets. DND will support deployed operations using PUK

tailored for shipborne operations and land-based domestic disaster response. The PUKs will contain materiel and scales reflective of the RCN resupply procedures and schedules. DND will be responsible for supply support of materiel that are procured and managed by DND through the CFSS, including but not limited to:

a. Bulk fuel and fuel delivered to UAS;

b. Government Furnished Resources (GFR) (Equipment identified as GFR for the UAS will be delivered to the Prime Contractor/OEM for integration into the UAS. DND will be responsible for sparing levels, procurement, and management of these GFR);

c. DND provided STE;

d. Cryptographic and Communication Security items;

e. DND and Government of Canada prescribed Personal Protective Equipment (PPE);

f. the associated warehousing and inventory management of PUKs after the initial procurement contract period is complete; and

g. Hazardous materials.

6.0 Training Program Concept

DND will rely on the prime contractor as part of the ISS contract to provide all authorized maintenance training throughout the UAS in-service life. This specific requirement will address maintenance personnel training as on-going steady state, regenerative, and continuation training.

As a part of the procurement contract, the Contractor/OEM will develop and deliver initial cadre training for vehicle and payload operators, producing qualified Air Vehicle Operators and Payload Operators. The procurement contract will also include training syllabus to develop Operator Instructors. The ISS contract will include the possibility for additional industry-delivered operator training if required for UAS system upgrades or modifications and UAV upgrades.

Annex B
RCN ISTAR UAS - Sustainment Questions

Obsolescence Management	Q1. How do you plan to manage obsolescence over the planned service life of the UAS? Q2. What is the expected service life of your UAS (airframe and associated parts) based experience with other customers? Is it based on calendar time and/or flight hours? Are those items sent for overhaul or disposal at the end of its service life? Q3. What component(s) are foressen as requiring upgrades or updates to maintain operational capability to 2040s. How are the develoment and installations costs calculated and passed on to operating customers? Q4. How is the concept of continuous improvement integrated in your program management framework? For hardware, software and support services?
Performance Metrics	Q1. What specific performance metrics are you using to manage and track your UAS operations and support with other customers? Q2. How do you define availability, serviceability, reliability, and maintainability? Q3. Given 1000 yearly flight hours (500hrs per UA), what is your percentage of: serviceability, availability, reliability, sustainment costs, technical issues, spares availability? Please include percentages for the UA and the GCS. Q4. Provide recommendation for how DND can implement a Performance Management Framework (PfMF) to track UAS ISS performance (i.e. availability, serviceability, & Reliability, support process cycles, etc) and incentivize Contractor to continually improve ISS. What metrics could be assessed/incentivized that align with the proposed industry ISS responsibilities?
Sustainment Strategy	Q1. What are your key UAS sustainment and/or equipment cost drivers? What are your top performance degraders leading to system downtime? Q2. What is the approximate sustainment costs per flying hour? Q3. Are there any sustainability issues with the long term storage of the UAS in its shipping container(s)? Are any special long term preservation procedures required? Are the shipping containers stackable?
Training	Q1. Does the aircraft control station and payload control station also provide training for mission planning and aircraft/payload operation? Or, are such features only available on a separate and dedicated training simulation system? Q2. What is your capability/experience in providing initial cadre training for operators and maintainers? Q3. Provide a high level overview of the course syllabus to be covered in the Operator, Maintainer training to be provided as part of the OEM delivered Initial Cadre Training.
Maintenance	Q1. What UAS related maintenance do you associate with first level, second level, and third level? Q2. What first level maintainence work do you foresee ship's staff performing to maintain the capability while at sea? Is there any limited second level maintainence work that you forsee ship's staff performing at sea? Q3. Is all maintenance carried out at first and/or third line? (i.e. no limited second line/intermediate level shops / maintenance). If there are any second line/intermediate level shops or maintenance requirements, what are they? (e.g. engine shop, battery shop, avionics shop, etc.) Q4. What specific second level maintenance work do you foresee DND shore based repair facility staff being able to do to sustain capability on fitted ships ? What is the level of effort required (i.e. person-hours, ground/flight tests, and equipment required such as overhead crane, cradles, engine stand, etc.) based on the anticipated usage and failure rates? Q5. What corrective maintenance tasks are the leading contributors to aircraft downtime? Q6. Do you have a Corrosion Control Program for UAS (e.g. inspection following flight over salt water, etc.)? If yes: What are the specifics of this program, including what constitutes a corrosive environment and the level of effort of any inspection requirements? Q7. What is the approximate number of maintenance hours per flight hour? What is an indicative percentage allocation of this effort to 1st, 2nd or 3rd level maintenance? Q8. How long and how many people are needed to re-assemble your UAS to a fully operational state from its shipping container and to disasseble back into its shipping container? Is additional euqipment needed, such as a crane? Q9. What are your preventative maintenance program requirements for your UAS? (i.e. specify all inspection types, intervals, and level of effort, including person-hours) Q10. What are the preventative maintenance requirements for your Ground Control Station (GCS)? Is there an established preventative maintenance program or is the GCS only repaired when broken? Q11. Describe the various levels or types of maintenance required for the UAS. Compare them to the DND Levels described in the Concepts of Support Document. Q12. What are typical Line Replaceable Units (LRUs) within your UAS that can be removed/replaced by ship staff? Would any of these be repairable at a DND shore-based 2nd level maintenance facility? Q13. Provide an overview of your ISS program, highlight key elements of the ISS program, and provide a breakdown of division of responsibilities between DND and contractor required to implement your ISS program Q14. Describe/list the initial Pack up Kit (PUK) to be supplied through the ISS contract to increase the level of spares required to support deployed operations; Q.15. Describe how you provide support for deployed missions to your other customers. Q.16 Describe your capacity to provide in-country sustainment. What level of ISS related work can be carried out in-country, and what is requried to be done out of country
	Q1. What square footage/volume is required to store one UAS onboard a ship (two UAVs and support items?)

Infrastructure Requirement	Q2. What specific aircraft maintenance support equipment (AMSE) is required to support 1st level maintenance work onboard a ship? (e.g. hydraulic stands, avionics (power carts), payload, test stands, etc.) Q3. What specific aircraft maintenance support equipment (AMSE) is required to support 2nd level maintenance at the DND owned shore based repair facility? (e.g. hydraulic stands, avionics (power carts), payload, test Q4. What would be the physical size and number of contents of a Deployable Pack-Up Kit (i.e. equipment and sparing to support two (2) UAS for a period of 6 month deployment? Q5. Advise as to what would be included/removed in scaled PUKs? For example, ship deployed on international missions may need PUKs to support upto 6 months deployment, but domestic deployments or domestic training may only require PUKs to support a 30 - 45 days deployment.

Material Management	Q1. What is your ability to provide a fully contracted Supply Chain Management solution? Describe your solution. Q2. Who maintains configuration of the UAS software? What are the timelines for the software update/change cycle? Q3. Identify and provide description of systems and subsystems (i.e. engine, avionics, airframe… etc) that are subject to Intellectual Property Rights that would constraint DND's ability to contract out support services to a service provider other than the OEM/Prime Contractor of the acquisisiton contract. Q4. What are typical Line Replaceable Units (LRUs) within your UAS that can be removed/replaced by ship staff? Would any of these be repairable at a DND shore-based 2nd level maintenance facility? Q5. Advise as to whether UAV airframes used by other customers are categorized as capital assets with a disposal plan or as consumables that are expected to be expended (i.e. batteries). Q6. Provide recommendation as to whether the UAV airframes should be categorized as capital assets with a disposal plan or as consumables that are expected to be expended/consumed (Provide examples of how you other customers have categorized the airframes and what contractual mechanisms is utilized to enable procurement of replacement airframes). Q7. Provide recommendation for alternative contractual options that can be utilzed to have the UAV Airframes replenished as they are consumed/damaged at sea (i.e. Stand-up a separate standing offer, include options to procure additional airframes in the acquisistion contract, include options to procure airframes in the ISS contract...etc).

Economic Benefits	General Q1. How will this procurement position your company for long-term growth in Canada? Q2. What are the key issues your company faces in general and within the RPS/AT sector in Canada? Direct Canadian Content and Supplier Development Q3. Can you identify potential Direct Canadian Content areas on this program? Q4. How would you propose partnering with Canadian Suppliers, including small and medium sized business, as a result of this program? Research and Development Q5. What R&D opportunities could be considered directly related to this procurement? Q6. Are there other R&D opportunities within the RPS/AT sector that could be leveraged? Export Q7. Do you see opportunities for growth that can position your company and Canadian suppliers for future exports? Please explain. Skills Development and Training Q8. How does your company address and face employment challenges to attract and retain skilled workers? Q9. Through this procurement, please identify Skills Development and Training opportunities. For example, does/could your company engage in: o work integrated learning programs (e.g., co-operative education; work placements); o apprenticeship programs; o a new or existing skill development program at or through a post-secondary institution; and o other activities that align with the ITB objectives for skills development and training.