

STATEMENT OF WORK - TERMS OF REFERENCE

Replacement (Upgrade) of the MV Holiday Island

Electronic Propulsion Controls Systems (EPCS)

1. BACKGROUND

- 1.1. The Holiday Island is a double ended (double pilot house) passenger and vehicle ferry ROPAX built in 1971 at Port Weller Dry Dock, St. Catherines, Ontario for Canadian National Railways. The vessel was designed and built to operate in the sheltered waters of the Northumberland Strait and serviced the Cape Tormentine, New Brunswick to Borden, PEI crossing. The vessel is now owned by Transport Canada and operated by Bay Ferries Ltd and services the Caribou, Nova Scotia to Wood Island, PEI crossing. The vessel operates eight months of the year from May to December.
- 1.2. The vessel is fitted with two (2) Anglo Belgian, Model 12VDZC-900-166K C2 main engines driving (through fluid drive clutches) two reduction gearboxes and Voith Schneider cycloidal propellers installed at either end of the vessel. The vessel was originally equipped with Regulateur Europa (Colchester, Essex, UK) electronic propulsion controls matched to the two Voith Schneider cycloidal propellers. The Regulateur Europa (RE) electronic propulsion control systems (EPCS) have entered the obsolete phase of their life cycle and are becoming unreliable.

2. SCOPE

- 2.1. The electronic propulsion controls installation is to be considered a 'turn key' solution. The successful contractor is responsible for all work required in completing the installation including all travel and living expenses. Any sub contract work required to complete the installation will be the sole responsibility of the contractor.
- 2.2. The successful contractor will be required to remove and replace the Regulateur Europa EPCS including all associated RE control wiring and to replace with a contractor supplied EPCS complete with all associated cabling and wiring to integrate the system with other onboard systems and existing machinery sensors. The work will consist of the design, test and installation of replacement EPCS such that automatic remote control is available in both the forward and after pilot houses, and that manual local control is available in the cycloidal propeller machinery spaces.
- 2.3. The successful contractor is responsible to ensure that all of the supplied equipment is type approved by LRS and that the installation work (including any completed by sub contractors) meets the standards and requirements of Class (Lloyds Register Marine) and TCMS.

3. REQUIREMENTS/DESCRIPTION OF THE WORK

- 3.1. The existing Regulateur Europa EPCS cables, modules, consoles and panels for both (2) Voith Schneider cycloidal propellers are to be removed and disposed of by the contractor. The contractor is then to complete the installation of the entire new electronic propulsion control systems (EPCS) for the two (2) Voith Schneider cycloidal propellers including: class and regulatory approval of the installation, set to work and testing, commissioning including dock and full sea trials. Sea trials are to be completed after the winter season sometime in the month of April.

The present installation consists of four RE (4) VSP control stations located in the two (2) pilot houses. Two (2) control stations located in the after and two (2) in the forward pilot houses. The two (2) RE control modules (one for each VSP) are located in the Engine Control Room (frame 100) inside the ECR control console. There is one (1) RE terminal Box located in each of the VS propeller rooms forward and aft which connect the control VS control valves to the system.

The existing control cable routings both fore and aft are located in accessible areas. The two pilot houses are both located on top of the upper open vehicle deck (Deck A). The existing control cable routings proceed from the two pilot houses across the open (Deck A) deck head to approximately frame 100 (approximate total distance of deck head cable runs 160 meters). Part of the deck head cabling located on Vehicle Deck A is enclosed by sheet metal cladding secured by screws.

The control cables then pass into into the centre structure and are routed vertically downward through two decks entering directly into the Engine Control Room (approximate vertical distance 20 meters). The control cables routes from the ECR to both fore and aft VSP rooms pass through two (2) water tight bulkheads (two forward and two aft – approximate total distance 150 meters). These watertight bulkheads are presently equipped with multi cable bulkhead transits.

The cable routing distances given above are approximate values. The contractor is responsible to verify all of the cable routing distances.

All new control cabling installed outside of the machinery spaces is to be protected conduit. All new control cabling installed in the within the machinery spaces using new or existing cable trays is to be properly installed, protected and secured using metal (stainless steel) cable tie wraps or equivalent.

- 3.2. The contractor is to provide new Voith Schneider cycloidal propeller EPCS's with the associated software that at a minimum, duplicates the functionality of the original as fitted Regulateur Europa EPCS. The EPCS must provide redundancy including operator stations, communication links, process controls and power supplies.

The new EPCS is to include the operation of the VS cycloidal propeller systems in either of two control modes – fixed rpm step mode and a combinatory mode. Both of these

control modes are to incorporate an automatic pitch reduction during main engine overload conditions. The contractor is responsible for consultation with the engine supplier to obtain the main engine load limit curves and power curves in order to create the proper control algorithms required. The two control modes are to include the following:

- a/ Three (3) fixed rpm step mode. These rpm step ranges to be defined during the project phase in consultation with the main engine supplier and set by the contractor.
- b/ Combinatory mode. Variable rpm in relation to the actual propeller pitch. The engine load/rpm curve range is to be defined during the project phase through consultation with the engine supplier and control program calculated and established by the contractor.

The contractor must verify and summarize in tabular form the existing equipment's functions and the corresponding proposed equipment functions for the tasks listed below:

- 3.2.1. Power Units – Two redundant power supply converters/isolators with a Class IP44 with sheet steel cabinets or better. The power units to contain redundant power converters, each converter dimensioned for 100% load. At least one of the two power converters for each VS propeller must be connected to the vessels main UPS. Note the vessel supply is 440/230/120 VAC, 3 Phase, 60 Hz.
- 3.2.2. The feedback potentiometer unit and control units must be physically separate and contain duplicated potentiometers.
- 3.2.3. There must be positive fail safe operation, (neutral position) for control transfer between pilot systems.
- 3.2.4. Ethernet Communication Units – Ethernet switch and firewall/routers with a Class IP44 sheet steel cabinets or better
- 3.2.5. Cables, cable connectors, enclosures, modules, electrical distribution panels that are class type approved for the vessel. The control wiring shall be shielded and the power cables armoured.
- 3.2.6. Bridge VSP Control Station & Display Units. The Voith Schneider propeller control station for each bridge (forward and aft) is to consist of two (2) VSP's – one (1) dedicated for the forward propeller and one (1) dedicated for the aft propeller. The supplied Bridge VSP control stations shall each have the following functions / capabilities:
 - 3.2.6.1. Joystick with redundant electronics
 - 3.2.6.2. Operating Module with five (5) functions

- Taking over of station command
- System selection
- Start/stop of the electrically driven control oil pump
- Scoop dump – emergency declutch of the fluid drive coupling
- Alarm indication and confirmation

3.2.6.3. Display (minimum 25 cm) with the following functions

- Status of main and redundant control system
- Actual VSP pitch feedback for longitudinal and transverse directions
- Actual engine speed in rpm's
- Actual engine load as percentage
- Actual propeller speed in rpm's
- Activation/switching of 3 fixed engine rpm steps
- Activation of combinatory mode
- VSP's temperatures for lubrication and control oil
- VSP's pressures for lubrication and control oil
- Alarm indications for oil temperature, oil pressure, oil levels

3.2.6.4. System selector switches for specifically switching off of one of the system controllers

3.2.6.5. Dimming potentiometer module for dimming the brightness of the control station illumination

3.2.6.6. A self-diagnostic system that continuously monitors all system components and communication structures. If a failure is detected an alarm is to be generated and corrective and fail safe mechanisms automatically activated.

3.2.6.7. The new ECPS must be capable of being integrated with an automatic piloting system.

- 3.2.7. The new control system should allow for the manual emergency operation that is currently fitted to be maintained. The current arrangement has a pin disconnect and manual lever override, and the new system shall accommodate this.
- 3.2.8. VS Propeller Controller Units. The two main EPCS control units (one for each VS cycloidal propeller) are to be located in the Engine Control Room (approx. frame 100). These two (2) units, one to manage each VSP are to be the interface between the pilot house control stations and the two (2) VS propellers. These control units are to house the CPU's, IO's, relays, signal transformers and communication and data exchange modules.
- 3.2.9. The contractor is to specify critical spare parts as part of the contract according to Class and manufacture's requirements. All of the spare parts identified through this process are to be supplied to vessel as part of the contract.
- 3.2.10. The contractor is to supply five (5) sets of operator's manuals, three (3) sets of technical manuals and three (3) sets of Installation manuals in a bound paper format. In addition, one electronic PDF copy of each manual is to be supplied. All name plates and caution plates are to be in English.
- 3.3. The Bidder must demonstrate the new EPCS's are of new, modern, electronic based technology in current production and is able to integrate with the existing main engines and Voith Schneider cycloidal propulsion control actuators. All programming, software and programmable hardware shall be open source. The Bidder must indicate the international standards to which the electronic and electrical equipment are constructed.
- 3.4. The Bidder must indicate the ability to support the new electronic propulsion control systems with a Factory Services Representative (FSR) available on site at the request of Transport Canada including the response time of a minimum of 48 hours to the vessel anywhere in Eastern Canada.

4. EXPERIENCE

- 4.1. The contractor's professional experience, expertise and qualifications are the key to a successful outcome. As such, the company shall have previous experience in the design and installation of electronic propulsion control systems for Voith Schneider propellers on board vessels of comparable size and complexity of the Holliday Island. The company shall also have to verify the availability of qualified personnel/resources in Eastern Canada to complete the installation and work and to provide warranty, maintenance and repair services for the future.
- 4.2. The contractor must have a minimum of three examples of such undertakings with vessels of comparable size must be included in the bid proposal with verifiable references. In addition the team lead for the project must have a minimum of five years experience in leading projects of similar undertakings, one of which must be one of the three identified above.

5. WORK PLAN

- 5.1. The contractor's professional experience and expertise are to be used to develop a work plan of sufficient detail to provide a clear indication of the time and scheduled required to undertake the design, installation and commissioning of the new system, while allowing for the demolition and removal of old system. The proposed work plan must be included in the bid/proposal and must identify the team members with accompanying resumes, supplemented by an organizational chart explaining the roles of each.

6. REFERENCES/BACKGROUND MATERIAL

| | |
|---------------------------------|--|
| Name | Holliday Island |
| Owner | Transport Canada |
| Manager | Bay Ferries Ltd. |
| Year Built | 1971 |
| Builder | Port Weller Dry dock, St. Catherines, Ontario |
| Home Port | Charlottetown, PEI |
| IMO# | 7041431 |
| Official# | 344866 |
| Gross Tonnage | 3037 |
| Registered Tonnage | 1593 |
| Deadweight at draft | 1419 |
| Frame spacing | 760 mm |
| Length OA | Approximately 99.01 meters |
| Length BP | 96.62 meters |
| Breadth (Moulded) | 20.42 meters |
| Extreme Breadth (Over fenders) | 20.75 meters |
| Depth (Moulded to vehicle deck) | 7.09 meters |
| Draft (all season - full) | 5.03 meters |
| Service Speed | 12 knots - witnessed |
| Classification | LRS + 100 A1, Caribou, NS to Wood Island, PEI |
| Passengers Maximum | 486 passengers + 22 crew |
| Vehicle Capacity | 150 cars + 14 tractor trailers (main deck only) |
| Lane Meters | 1045 |
| Main Engines | 2 x Anglo Belgian Corp, Mod 12VDZC-900-166K |
| C2 | 2388 kW @ 900 rpm |
| Generators | 2 x Cummins, Mod NTA 855G2 (Big Cam) 275 ekW @ 1200 rpm 440/230/120 VAC, 60 Hz |
| Reduction Gear | 2 x Hindmarch/MWD, Type R, Size 9 |
| Clutch/Couplings | 2 x Fluid Drive Engineering Co Ltd, UK, Size 52 |
| Propulsion | 2 x Voith, Cycloidal Propeller, Nr 1760, 1970 Type 36G/225 |

- 6.1. The Holiday Island is a RoPax, double ended (two pilot houses at extreme ends) ferry powered by two (2) Anglo Belgian Corporation, Model 12VDZC-90-166-K C2 turbocharged diesel engines rated at 2388 kW at 900 rpm. The two main engines are coupled to the two reduction gearboxes through fluid drive couplings/clutches.
- 6.2. The two fluid drive couplings/clutches are original equipment manufactured by the Fluidrive Engineering Company, Isleworth, Middlesex, UK. This company is now owned by Voith AG. The fluid drives incorporate an internal clutch (scoop) which is used to decouple the main engine from the shaft drive line. A 'scoop' dump switch is located in the pilot houses for both coupling/clutches allowing the main engines to be decoupled from the shaft drive line in an emergency.
- 6.3. The reduction gearboxes are manufactured by Hindemarch/MWD. Each reduction gear box is fitted with one inputs and one output shaft with a 5:1 gear ratio. This produces an output shaft speed of 180 rpm to the Voith Schneider cycloidal propeller when the input shaft speed equals 900 rpm. The maximum rotational speed of the Voith Schneider cycloidal propeller is 61 rpm when the main engines are operated at their maximum continuous speed.
- 6.4. The Voith Schneider type 38G/225 cycloidal propellers located at either end of the vessel are original equipment. The hydraulic control cylinders and their mechanical linkage for both fore and aft propulsion units have been recently renewed. The cycloidal propellers are clockwise rotating, five bladed, with a blade length of 2250 mm and a diameter of 3600mm. The maximum pinion shaft input speed is 180 rpm and the maximum producing a maximum cycloidal propeller speed of 61 rpm.
- 6.5. The two Anglo Belgian main engines were newly installed in 2014 and were supplied by Cores Worldwide Inc. This company is an authorized dealer in Canada for ABC and they are located in Belnan, Nova Scotia.
- 6.6. The electrical distribution system for the vessel is 440/220/120 VAC, 3 Phase, 60 cycles.
- 6.7. The following documentation shall be made available to the contractor:

6.7.1. Drawings

| Drawing Number | Drawing Name |
|----------------|--|
| | General Arrangement Lower Decks |
| | General Arrangement Upper Decks |
| | General Arrangement Profile |
| | Arrangement of Machinery Spaces |
| | Electrical One-Line Drawing |
| | Regulateur Europa Electrical Drwg. Package |

6.7.2. Manuals

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| Regulateur Europa EPCS Manual and Data |
| Voith Cycloidal Propeller Operators and Maintenance Manuals |
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7. RESPONSIBILITIES OF CONTRACTOR / RESPONSIBILITIES OF TC

- 7.1. The Contractor will be required to actively participate in the overall management of all activities related to the assessment and will be directly responsible for the effective supervision and coordination of the efforts of its personnel in order to minimize the effort required by TC staff.
- 7.2. The Contractor will be responsible for all work produced under the contract, including completeness, accuracy and adherence to all relevant safety & environmental regulations, rules and good practices including TP 127. The contractor is to be responsible for obtaining and maintaining any hot work certificates that are required to complete the installation work. The Contractor shall be responsible for arranging and funding the approvals and visits of LR surveyor’s during fabrication, installation and testing.
- 7.3. Contractors are to be aware of the presence of asbestos in areas that may be impacted by the installation of the system. Prior to installation, TC staff will review the Contractor’s work plan and identify areas containing asbestos. The Contractor is then responsible to ensure that all necessary precautions are taken to remove asbestos material from the affected spaces prior to commencing work, and in accordance will all applicable laws and regulations. Asbestos Remediation shall be considered new work under this contract and Contractors will be provided with an allowance of \$15,000.00, to be adjusted up or down as required, to sub-contract Asbestos Remediation services to an approved company.
- 7.4. The contractor is responsible to ensure that any cabling or cable penetrations of watertight/fire bulkheads is to be completed such that is complies with all applicable TCMS and LRS standards and regulations for this class of vessel.
- 7.5. The contractor is to ensure that all components of the supplied system and associated wiring, connections and associated components are type approved by LRS as items for main engine control systems usage. The work is to be completed to a standard that complies with LRS and TCMS requirements.
- 7.6. The contractor is responsible for all costs relating to the certification of the system and the witnessing of the Factory Acceptance Testing by Class

- 7.7. The Contractor must maintain an electronic library of the work in progress and delivered items. The contractor is to supply to TC a copy of the Class Compliance Certificate from LRS for the ECPS. The contractor is to supply to TC a copy of the Factory Acceptance Test Certificate for the equipment.
- 7.8. Contractor personnel must make all necessary preparations in order to actively participate in any meeting convened by the Technical Authority.
- 7.9. All meetings will be conducted at facilities to be provided by TC or any third party, unless otherwise requested by the Technical Authority. In the latter case, the meeting will be conducted in the Contractor's facility and the Contractor must provide all facilities, resources, etc required at no additional cost to the Government of Canada.
- 7.10. The Contractor must maintain a history of all meetings as well as of all incremental changes to actions items and submit it to the Technical Authority when requested.
- 7.11. All travel-related costs will be borne by the Contractor, and included in the bid price.
- 7.12. The installation of the electronic propulsion control systems engine is to be completed while the vessel is in winter layup, during the period of December 31, 2016 – April 14, 2017 at Caribou, Nova Scotia. The location of the vessel will be confirmed prior to contract award.
- 7.13. All other work will be conducted on-site (e.g. at the Contractor's place of business); TC will not provide office space/work accommodations for the Contractor.
- 7.14. After a contract award, the Government of Canada will not consider any requests to amend the contract basis of payment to allow the Contractor to recover any costs associated with a change in the location where the required services are provided.
- 7.15. TC support to Contractor: To aid the contractor in the provision of the required services, the following information materials and assistance will be provided if available and deemed appropriate by the Technical Authority.
- 7.16. All required and available documents and drawings related to the Holiday Island.
- 7.17. Canada will make the existing electronic propulsion control systems (Regulateur Europa) documentation such as drawings, manuals, bulletins, builder's information etc., and the vessel available for the viewing and inspection period. During that period the vessels crew will assist the Bidders to have access to points of interest and areas of inspection. The Technical Authority and/or its delegated representatives will be on site during the viewing period to answer questions and provide clarification. All questions, answers and clarifications raised during the viewing and inspection period will be noted and distributed to all Bidders as contractual information.

8. SECURITY REQUIREMENTS

The research undertaken and the subsequent report will not relate to or result in sensitive or protected information.

9. IMPOSED CONSTRAINTS

- 9.1. Decisions concerning the revision or definition of key search criteria, as well as contractual obligations and requirements, are excluded from the contractor's services. Contractor personnel must limit themselves to provide comments and recommendations only to the Technical Authority on these issues.
- 9.2. The personnel of the Contractor providing the services must be independent of direct control by servants of Canada are not in any respect employees or servants of Canada.
- 9.3. During the performance of the contract, the Contractor and the Contractor's personnel must not direct any departmental organization, or any personnel of any third parties with whom Canada has or intends to contract, to perform any action.
- 9.4. All drawings, reports, data, documents or materials, provided to the Contractor by the Government of Canada remain the property of Canada and will be used solely in support of this requirement. The Contractor is required to safeguard the preceding information and materials from unauthorized use and must not release them to any third party, person or agency without the express written permission of the Technical Authority. Such information and material must be returned to the Technical Authority upon completion of the services or when requested by the Technical Authority.
- 9.5. All correspondence, either initiated by the Contractor personnel or by any section of TC, must be submitted to the Technical Authority. Correspondence is defined as records of conversations or decisions as well as any written correspondence in any format.
- 9.6. The Technical Authority or other authorized departmental government representative must have access at all times to the work that is being performed.
- 9.7. The Contractor must ensure that their personnel do not use Government of Canada or TC designations, logos or insignia on any business cards, cubicle/office signs or written/electronic correspondence that in any manner lead others to perceive contracted personnel as being an employee of Government of Canada.

10. DELIVERABLES

- 10.1. The deliverables must be in the form of services provided to the Technical Authority in accordance with the assessment and the products generated thereof.
- 10.2. A meeting will be arranged at the Contractor's place of work, or via teleconference with the Technical Authority to discuss the project and deliverables.

- 10.3. The demolition of existing Regulateur Europa electronic propulsion control systems including all cables, modules, consoles and panels for both pilot houses, the ECR and the forward and after propulsion rooms
- 10.4. A fully functioning and operational electronic propulsion control systems compliant with the requirements of this RFP, including documentation and approved installation drawings attesting to classification Society and regulatory approval of the installation and operation of the EPCS.
- 10.5. The provision of service technicians for the completion of dock and sea trials for a period sufficient to satisfy the classification and regulatory requirements, and to demonstrate the requirements of this RFP are met.
- 10.6. Two (2) copies of installations and operational manuals (in English) in a bound paper format, explaining the details of the installation and operation of the system, including troubleshooting where applicable. In addition, one electronic PDF copy of the manual is to be supplied.
- 10.7. Two (2) independent sessions of training and familiarization of the system and its operation for the engineering staff of the vessel.
- 10.8. Record of Work, a report on the general tasks undertaken to perform the services required as part of this assessment and associated level of effort. The Record of Work will be submitted in a format acceptable to the Technical Authority. The Record of Work is to be attached to the Contractor's invoice.
- 10.9. Unless otherwise specified by the Technical Authority, two hard copies and one soft copy of the deliverables must be provided to the Technical Authority. Soft copy deliverables must be provided electronically. In addition, deliverables must be provided according to the following format: MS Word and/or Adobe Acrobat. Other formats may be accepted if approved by the Technical Authority.
- 10.10. The contractor should be aware that the deliverables provided may form part of a subsequent specification or information package provided to another entity. As such, the contractor is advised the IHM may be relied upon by other parties.

11. INTELLECTUAL PROPERTY

- 11.1. TC has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada, on the following grounds: the main purpose of the contract, or of the deliverables contracted for, is to generate knowledge and information for public dissemination.

12. TRAVEL REQUIREMENTS (if required)

- 12.1. Travel expenses are to be included in the costing and bid proposal.

13. PROJECT SCHEDULE

- 13.1. The demolition and removal of the existing system, and the installation of the new system must occur between the dates of: Dec 31, 2016 – April 30, 2017

14. BASIS OF PAYMENT

- 14.1. The Basis of Payment for this contract will be fixed price including travel expenses.

15. CONTINUITY AND REPLACEMENT OF RESOURCES

- 15.1. The selected Contractor shall not commence any work or be entitled to any compensation for any work undertaken unless the Contract Authority has authorized the work to begin.
- 15.2. The selected Contractor shall be responsible to ensure that all proposed personnel and other professional resources are assigned for the duration of the contract and are not replaced without due cause. In the event that a resource is to be replaced, it will be the Selected Contractor's responsibility to ensure that there is no negative impact on any work in progress.
- 15.3. Should for any reason, the designated resources for a deliverable are not available, then the selected Contractor shall immediately make available a fully qualified replacement resource to be approved by the Project Authority. Such approval is not intended to limit the selected Contractor's flexibility but to ensure the use of agreed-to resource levels and experience for stated deliverables. The Project Authority retains the right to refuse the proposed backup resources in which case, and within a reasonable period of time, the selected Contractor shall propose alternate resources. If no suitable replacement resource can be provided within a suitable timeframe (maximum of one (1) week), then the Project Authority may elect to terminate the Contract, or may elect to use an alternate method. Note that replacement resources are to be evaluated in accordance with the original evaluation.

Selection Criteria

Contractor Selection Method

The selected contractor will be determined on the basis of the highest responsive combined rating by a 60/40 ratio of the technical merit and price respectively.

Final score = Technical merit score + Lowest Price Score
(maximum: 100 points) (maximum: 60 points) (maximum: 40 points)

Lowest Price Score

The lowest priced technically responsive proposal is allocated the maximum of 40 points and other technically responsive proposals are awarded points according to the formula

Lowest price score = lowest priced proposal / bid price x 40

Point Related Technical Merit Score

The total points are 125

Minimum points is 90/125

Technical Merit Score = ((total score)/125) X 60

Mandatory Technical Criteria

The bid must meet the mandatory technical criteria specified below. The bidder must provide the necessary documentation to demonstrate compliance with this requirement.

Bids that fail to meet the mandatory technical criteria will be declared non-responsive. Each mandatory technical criterion should be addressed separately.

Mandatory Technical Criteria (MT)

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|--|-----|---------|-----------------------|
| MT1 | <p>Bidders must demonstrate completeness and quality of the written proposal. Demonstration of how the requirements are to be met</p> <p>Indicators</p> <p>Respond to Section 3 and describe in writing how each requirement will be met in a thorough, concise and clear manner.</p> | | | |
| MT2 | <p>Bidders must demonstrate that the EPCS is approved by LRS (Class)</p> <p>Submit documentation from LRS that they will provide design assessment and approval according to Class Rules and Regulations applicable to the specified EPCS as per the SOW</p> | | | |
| MT3 | <p>The bidder must provide evidence that it has successfully completed at least three (3) similar projects in the last five (5) years on vessels of comparable size, propulsion type and complexity</p> <p>This must be in the form of objective evidence – for example - as reference letters from clients.</p> | | | |
| MT4 | <p>Bidders must demonstrate that the new EPCS's at a minimum duplicates the functionality of the existing system.</p> <p>The contractor must verify and summarize in tabular form the existing equipment's function</p> | | | |

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|---|-----|---------|-----------------------|
| | and the corresponding proposed equipment's functions for items listed in Section 3.2 | | | |
| MT5 | <p>Bidders must demonstrate that they can provide an Eastern Canada FSR in place to provide support within 48 hours of a call out</p> <p>Contractor to provide identification and qualifications of the FSR together with contact information</p> | | | |
| MT6 | <p>The bidder must demonstrate that the new EPCS's are of a new, modern, electronic based technology in current production and is able to be integrate with the existing propulsion systems, alarm and monitoring systems</p> <p>The programming, software and programmable hardware shall be open source. The contractor must provide the international standards to which the electronic and electrical equipment are constructed</p> | | | |
| MT7 | <p>Bidders must provide with their proposals a sample of a Shipyard Installation Specification from a previous same type EPCS installation contract</p> <p>Contractor to provide a minimum of one documentation package</p> | | | |
| MT8 | <p>Bidders must provide with their proposals a sample of a Shipyard Installation drawing package from a previous same type EPCS installation</p> <p>Contractor to provide a minimum of one drawing package</p> | | | |
| MT9 | Bidders must submit with their proposal a sample of installation, operation and troubleshooting manuals from a previous same | | | |

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|---|-----|---------|-----------------------|
| | <p>type EPCS installation</p> <p>Contractor to provide a minimum of one written documentation package</p> | | | |
| MT10 | <p>Bidders must provide a duration and cost estimate for each of the following activities:</p> <p>Contractor to provide a written cost estimate</p> <ul style="list-style-type: none"> - Strip of old equipment and cabling - Installation of new equipment and cabling - Set to work and testing - Dock trial - Sea trial | | | |
| MT11 | <p>Bidders must describe the Document Management Plan for drawings and specifications – including regulatory approvals and client feedback</p> <p>Contractor to provide written documentation management plan</p> | | | |
| MT12 | <p>Bidders must provide a preliminary planning and scheduling which will indicate in working days the duration of each of the following activities with links associated to their respective predecessors and successors</p> <p>Contractor to provide planning schedule using MS Project or equivalent software</p> <ul style="list-style-type: none"> - Contract Award - Development of the Preliminary Design Package - Contractor to begin the Preliminary Design Package work - Submission of a Preliminary Design Package including specifications and drawings - Review by Canada of the Preliminary | | | |

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|---|-----|---------|-----------------------|
| | <p>Design Package</p> <ul style="list-style-type: none"> - Development of the Approval Design Review Package - Submission of the Approval Design Review - Review by Canada of the Approval Design Review Package - Period of approval by Class - Period of manufacturing and procurement of components - Period of factory assembly of components - Period of Factory Acceptance Tests - Delivery of system components - Warranty period | | | |
| MT13 | <p>Bidders must provide a sample Gantt chart indicating the milestones for the formal progress reviews</p> <p>Contractor to provide Gantt chart derived from MT12</p> | | | |
| MT14 | <p>Bidders must provide evidence that they have in place a Quality Management System registered to ISO 9001-2008 or a Quality Management System modeled on ISO 9001-2008</p> <p>Contractor to provide documentation to verify one of the requirements listed below</p> <ul style="list-style-type: none"> - A valid ISO 9001-2008 certificate - An example of its Quality Control Plan as applied on previous projects - A sample of an Inspection and Test Plan developed with the Quality Control Plan | | | |
| MT15 | <p>The bidder must provide the organisational chart of the team undertaking the project, indicating their respective roles.</p> <p>Contractor to provide documentation identifying</p> | | | |

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|--|-----|---------|-----------------------|
| | all of the team members for the project | | | |
| MT16 | <p>Bidders must provide the resume of the proposed team members that will complete and supervise the work. This team must include:</p> <p>Contractor to provide at a minimum documentation for the team members listed below</p> <ul style="list-style-type: none"> - An employee with a minimum of five (5) years' experience in the last seven (7) years in managing the distribution and revision of tasks according to defined procedure identifying the roles and responsibilities of all parties involved - An employee with technical training and a minimum of five (5) years' experience in the last seven (7) years in the integration of all new and retained existing systems and components described in this RFP. The employee must manage integration tasks according to a defined procedure identifying the roles and responsibilities of all parties involved. The employee must have recent experience in the integration of programmable electronic systems and marine propulsion equipment and the resources to enable a controlled integration process. | | | |
| MT17 | <p>Bidders confirm that all engineering, parts, cabling and components of the system can be delivered on or before the date work is scheduled to commence.</p> <p>Bidders must confirm that the Set to Work, Trials, Commissioning and Training agendas and planning can be delivered on or before April</p> | | | |

| Number | Description of Criterion | Met | Not Met | Cross Ref to Proposal |
|--------|---|-----|---------|-----------------------|
| | 14, 2017. Contractor must provide documentation verifying that both target dates stated above can be met | | | |

Technical Merit (TM)

TM1 Training

| Description of Criteria | Score | Indicators |
|---|-------|--|
| <p>Bidder has identified EPCS training on board or during the FAT for senior staff</p> <p>Total (10 points)</p> <p>(0-2 points) The bidders identification of training does not meet the requirements in certain areas and it is unlikely to provide effective training</p> <p>(3-6 points) The contractor's identification of training meets the minimum requirements for this aspect</p> <p>(7-10 points) The contractor's identification of training meets many or all of the requirements</p> | | <p>Maximum of 40 hours of EMS training in a suitable environment</p> <p>Minimum of 24 hours of EMS training in a suitable location</p> <p>Suitable location would be on board the vessel or in a Class Certified Propulsion Plant Simulator with identical equipment</p> |

TM2 Supportability

| Description of Criteria | Score | Indicators |
|---|-------|--|
| <p>Declaration of the location of the FSR's in Canada and their availability to be on site</p> <p>Total (4 points)</p> <p>(2 points) Declaration that acceptable FSR resources are available in Canada and can be on site within 48 hours</p> <p>(4 points) Declaration that acceptable FSR resources are available in Eastern Canada and can be on site within in 24 hours</p> | | <p>Proposal must provide details of FSR qualifications, resources, their location and level of support</p> |

TM3 Commercial (off the shelf)

| Description of Criteria | Score | Indicators |
|--|-------|--|
| <p>Declaration of the availability of off the shelf parts availability</p> <p>Total (4 points)</p> <p>(0 to 2 points) Commercially available sub components (only) available in North America</p> <p>(2 to 4 points) Commercially available major components and sub components available in North America</p> | | <p>Proposal must include details of availability of replacement major components and sub components in a North American location</p> |

TM4 System Supportability from OEM

| Description of Criteria | Score | Indicators |
|---|-------|--|
| <p>Years of service guarantee</p> <p>Total (10 points)</p> <p>(0 to 5 points) Ten (10) years' service support guarantee</p> <p>(5 to 10 points) Fifteen (15) years' service support guarantee</p> | | <p>Bidder must state the length of time of full service supportability</p> |

TM5 Component Supportability

| Description of Criteria | Score | Indicators |
|---|-------|---|
| <p>Years of component support</p> <p>Total (10 points)</p> <p>(0 to 5 points) Ten (10) years parts availability guarantee</p> | | <p>Bidder must state the length of time for supportability of the components and sub components</p> |

| | | |
|--|--|--|
| (5 to 10 points) Fifteen (15) years parts availability guarantee | | |
|--|--|--|

TM6 Drawings

| Description of Criteria | Score | Indicators |
|--|-------|--|
| All drawings are to be produced at a specific standard Total (7 points) (0 points) Multiple standards to be used (2 points) IEC 61355 to be used (2 points) ASME Y14.5 (M) to be used (2 points) ASME Y Electrical and Electronic to be used (7 points) ISO 01.100 Technical Drawings to be used | | Bidder must state the drawings standard to be utilized |

TM7 Drawings and document revision control

| Description of Criteria | Score | Indicators |
|---|-------|---|
| Drawing and revision control Total (2 points) (2 points) ISO/IEC 27001 Standard | | Bidder must state only ISO/IEC 27001 standard of document and revision control to be utilized No points for the stated |

| | | |
|--|--|---------------------------|
| | | use of any other standard |
|--|--|---------------------------|

TM8 Factory Acceptance Test

| Description of Criteria | Score | Indicators |
|--|-------|--|
| Physical layout to be used during the FAT Total (10 points) (5 points) 3D Computer generated 'mock up' (10 points) Physical arrangement to scale with ship installation | | Bidder must state how the Factory Acceptance Test will be conducted. No points awarded for any other FAT layout will be given |

TM9 Communication integration

| Description of Criteria | Score | Indicators |
|--|-------|---|
| Communication integration with other propulsion equipment, monitoring and safety systems Total (3 points) (1 point) Analog Variable Transmission (2 points) Serial communication (3 points) Genius bus or Modbus, serial to Ethernet adapter | | Bidder must state how communication integration will be achieved No points will be awarded for any other type of communication integration |

TM10 Feedback

| Description of Criteria | Score | Indicators |
|---|-------|--|
| <p>Feedback from contractor to client during the design phase of the project</p> <p>Total (15 points)</p> <p>Feedback acceptance on Human – Machine interface ergonomics from Canada</p> <p>(5 point)</p> <p>Number of design revisions allowed by the contractor before cost increases</p> <p>(2 points) 2 revisions only</p> <p>(5 points) 2 to 5 revisions</p> <p>(10 points) More than 5 revisions</p> | | <p>Bidder must state how client feedback during the design phase of the project will be accommodated</p> |

TM11 Corporate track record

| Description of Criteria | Score | Indicators |
|--|-------|---|
| <p>Corporations background and experience in EPCS design, installation and integration with comparable vessels</p> <p>Total (15 points)</p> <p>(5 point) 10 years' experience</p> <p>(10 points) 10 to 20 years' experience</p> <p>(15 points) 20+ years' experience</p> | | <p>Bidder to indicate experience and background through written documentation</p> |

TM12 Similar experience

| Description of Criteria | Score | Indicators |
|--|-------|--|
| <p>Demonstrated minimum of 3 similar projects involving design, integration and installation</p> | | <p>Bidder indicate experience in a</p> |

| | | |
|--|--|--|
| <p>of EPCS on similar drives and (comparable) vessels.</p> <p>Total (15 points)</p> <p>(5 point) 3 to 5 examples</p> <p>(10 points) 5 to 8 examples</p> <p>(15 points)10+ examples</p> | | <p>minimum of 3 similar EPCS installations in vessels of similar size and propulsion complexity</p> <p>Complete with written references from a minimum of 3 clients.</p> |
|--|--|--|

TM13 Key Personnel

| Description of Criteria | Score | Indicators |
|---|-------|---|
| <p>Demonstrated qualifications and experience of the key personnel to be involved in the project. This item relates to MT15</p> <p>Total (20 points)</p> <p>(5 points) Diploma or degree in an electronic or electrical field</p> <p>(10 points) Professional Engineer in an electronic or electrical field</p> <p>(Max 10 points) Years of experience of key personnel is based on the overall average of assigned key persons. Two years equals one point. The two people identified in MT15 shall have the number of years of experience each added for total number years.</p> <p>Example: person one has 6 years of experience and person two has 8 years of experience. Total years 14 therefore 7 points would be awarded.</p> | | <p>Bidder's proposal should include an organizational chart of the team indicating the key personnel.</p> |