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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Title - Sujet Shaft Line Bearing Replacement	
Solicitation No. - N° de l'invitation F6855-161166/A	**Amendment No. - N° modif.** 001
Client Reference No. - N° de référence du client F6855-161166	**Date** 2016-10-18
GETS Reference No. - N° de référence de SEAG PW-$OLZ-002-6709	
File No. - N° de dossier OLZ-6-39112 (002)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2016-11-03**	**Time Zone** **Fuseau horaire** Newfoundland Daylight Saving Time NDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Dalton, Colleen	**Buyer Id - Id de l'acheteur** olz002
Telephone No. - N° de téléphone (709) 772-4931 ())	**FAX No. - N° de FAX** (709) 772-4603
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Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature** **Date**	

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F6855-161166		OLZ002
Client Ref. No. - N° de réf. du client	File No. - N° du dossier	CCC No./N° CCC - FMS No./N° VME
F6855-161166	OLZ-6-39112	

Amendment to replace attachment 001 with the correct Statement of Work for this requirement. Please disregard the original attachment 001 as this was posted incorrectly.

CCGS Louis S. St. Laurent

Shaft Line Bearings Replacement

Statement of Work

1. BACKGROUND

The Canadian Coast Guard vessel Louis S St Laurent is Canada's heaviest ice breaker displacing 14,504 tonnes. The vessel operates in the Gulf of St. Lawrence in the Winter months and in Canada's high Arctic in the summer and fall.

The vessel is fitted currently fitted with three (3) propulsion shafts that are supported by three (3) "michell" pedestal type bearings on each shaft. The existing bearings are in excess of 45 years old, with reliability and supportability becoming an issue.

This Statement of Work (SOW) defines the technical and performance requirements the supply and installation of nine (9) propulsion shaft pedestal for the Canadian Coast Guard Ship Louis S. St-Laurent (LSSL).

2. OBJECTIVE

The purpose of this Statement of work shall be for contractor to supply new pedestal bearings and an engineering package for the installation of the new bearings as per the attached Technical requirements.

3. SCOPE OF WORK

The Contractor shall be responsible for the supply of replacement shaft line bearings for the CCGs Louis s St. Laurent:

1. Replacement of the existing Michell shaft line pedestal bearings with suitable and approved units that will last a minimum of 15 years' service life without requiring replacement or major service.
2. Integration of the new pedestal bearings with the existing bearing cooling water and alarm systems without major modification or additions.
3. Meet all Class Requirements related to the installation, alignment and monitoring of propulsion shafts.

4. DELIVERABLES

1. The contractor shall supply at the time of closing;
    a. Details of their proposal to replace the shaft bearings for the CCGS Louis S St. Laurent. The proposal shall indicate how the proposed bearings meet the requirements described in this document.
    b. General Arrangement drawing for proposed bearings
    c. Bearing load Calculations

2. The contractor shall also provide approvals design package as detailed in the Specification and according to the specified time lines.

Any questions can be forwarded to PWGSC Contracting Authority as indicated in the Solicitation document.

TECHNICAL REQUIREMENTS

1. Vessel Particulars

CCGS "LOUIS S. ST. LAURENT" PRINCIPAL PARTICULARS

Length	392.5 feet
Beam	80 feet
Moulded Depth	43 feet
Moulded Design Draft	30 feet
Gross Tonnage	11,345 tons

For the purposes of this SOW, the technical requirements described herein are for all (3) three shaft lines.

2. APPLICABLE DOCUMENTS

2.1 EXISTING DRAWINGS

Drawing #	Drawing Name
MA-286-106	Shaft Detail
MA-286-107	Detail of Shafting – Centre Shaft
MA-286-108	Detail of Shafting – Wing Shafts
6005-419-001	Diagrammatic Arrangement of Salt Water Cooling

2.2 APPLICABLE RULES, REGULATIONS, AND STANDARDS

The following supplementary documentation is also applicable to the general performance of these project requirements:

2.2.1 Canada Shipping Act 2001 and subsequent regulations pertaining to a ship having general particulars as specified under Section 3 of this specification;

2.2.2 Rules of a recognized Classification Society e.g. Lloyd's Register Part 5 (Main and Auxiliary Machinery), Lloyd's Register Part 6(Control and Electrical); Lloyd's Register's Rules for the Manufacture, Testing and Certification of Materials;

2.2.3 CSA W47.1 1983 – Canadian Welding Bureau Standards for the fusion welding of steel; CSA W47.2-M1987(R1998) – Canadian Welding Bureau Standard for the fusion welding of aluminum and aluminum alloys;

2.2.4 DFO 5781 (18-080-000-SG-001) Welding of Ferrous Materials;

2.2.5 DFO 5782 (18-080-000-SG-002) Welding of Aluminum and Aluminum Alloys;

2.2.6 Transport Canada TP 127E Ships Electrical Standards;

2.2.7 IEEE 45 Recommended Practice for Electric Installations on Shipboard;

3. CLASS REQUIREMENTS

The bidder must demonstrate the shaft line work and procedures will be assessed and approved by Lloyd's Register in keeping with the applicable rules pertaining to shafting and alignment. These include, but are not limited to Part 5, Chapter 6 (Main Propulsion Shafting) and Part 5, Chapter 8, Section 5 (Shaft Alignment).

4. CONTRACTOR REQUIREMENTS AND RESPONSIBILTY

4.1. CONTRACTOR REQUIREMENTS

In addition to meeting the above LR Class Requirements, the successful bidder shall provide documentation that they meet the following in order to be considered compliant:

4.1.1 Similar shaft line work done within the last 2 years.
4.1.2 Previous Class experience with a minimum of 5 Ice Breaking vessels.
4.1.3 Provide integrated components package with in house technical services during installation, alignment, testing and run up.
4.1.4 Demonstrated ability to perform in situ machining of intermediate shaft journals without removal of shaft lines.
4.1.5 Provide in country support for all new supplied components.
4.1.6 Provide service personal for supplied components within 24hrs.
4.1.7 Provide any required "off the shelf" spare parts within 3 days.

5. CONTRACTOR SCOPE, PROCEDURE & RESPONSIBILITIES

The existing Michell pedestal bearings for each shaft line (2off - intermediate shaft, 1off - propeller shaft) are to be replaced with new LR approved split type pedestal shaft bearings. Existing bearing seating and support structure are to be utilized and/or modified to suit new bearing installation. The new bearings must accommodate the shaft line rakes, the vessels various trim conditions and dynamic actions when at sea/icebreaking. In addition, the new bearing oil seals must maintain proper seal during all operating conditions.

The new pedestal bearings are to be self-contained, oil lubricating type suitable for ice breaking duty.

In addition, the installation of the new pedestal bearings will require:

- In situ machining of existing shaft journals to renew surfaces i.w.o.

new pedestal bearings.

- Modification of existing bearing support structure to suit new split bearings and subsequent shaft alignment.
- Connection to existing bearing sea water cooling system.

5.1 CONTRACTOR SCOPE

The Contractor shall have included in their bid the cost to carry out the following work:

5.1.1 Examination and machining of existing shaft journals. The contractor shall be required to examine the existing condition of the shaft journals where the bearings ride and shall be responsible for machining of all journals to a common size to facilitate the new bearing install. The contractor shall be responsible for determining the final size which shall be approved by the CCG Technical Authority and Lloyds Register. The contractor shall allow in their bid, but show separately, the cost for removal of 0.5mm of material over the length of each journal.

5.1.2 Engineering and supply of new pedestal bearing assemblies. The contractor shall be responsible for supplying LR approved pedestal bearings that are capable of handing the loads and stresses associated with a vessel operating in Heavy ice conditions. Drawings provided indicate shaft loading. These new bearing assemblies shall be sea water cooled with cooling water provided from existing cooling water supply lines.

5.1.3 Supply and install new pedestal bearings seating arrangements for the intermediate and screw shaft sections. The contractor shall be responsible for the carrying out a detailed examination of the existing bearing seating arrangements. The contractor shall provide engineering details on any changes required to the bearing seating arrangement. This information shall be presented to CCG TA and Lloyd's register for evaluation and approval. This shall include details on the bearing ahold down arrangements. After approval this engineering work shall be used by the contractor to provide a detailed specification that can be used by a ship yard to complete any modifications to the bearing seating arrangement. Format of the specification shall be provided by CCG.

5.1.4 Alignment of shaft lines (including existing thrust blocks) up to propulsion motors shall be completed under the guidance of a CCG provide alignment professional.

5.1.5 The new shaft bearings shall have bearing temperature sensors factory installed that can connect to the existing alarm and

monitoring system on the vessel.

NOTE: All equipment and design work shall be approved by Lloyd's Registry.

5.2 CONTRACTOR RESPONSIBILITIES

During the performance of the work, the Contractor shall retain total system responsibility for the following activities:

- Designing, manufacturing, testing, and delivery to CCG of all Replacement Pedestal Bearings.
- Provide classification society type approval certificates from a Transport Canada recognized organization under the Delegated Statutory Inspection Program (DSIP) for the design, manufacturing and testing of the Replacement Bearings;
- Machining of shaft journals to suit the new bearings, this will involve machining of the shafts in place on the vessel.
- Provide an installation specification to the CCG to allow ship yards to bid on the installation of the supplied bearings.
- Provide Field Service Representatives (FSRs) for the commissioning and sea trials of the newly aligned shafts, new bearing installation and shaft monitoring system. Travel and living expenses will be reimbursed upon receipt of invoices.

6. OTHER REQUIREMENTS

6.1 APPROVAL DESIGN PACKAGE (ADP) DELIVERABLES

The Contractor shall submit an approval design package (ADP) within four (4) weeks of contract award to the Inspection Authority and Technical Authority for Canadian Coast Guard review and comment prior to Class and TCMS approval. The Package shall include all components of sections 6.1.1 and 6.1.2.

6.1.1 APPROVAL DESIGN PACKAGE DETAILS

The Contractor's ADP shall contain the following documentation and design details to allow the Canadian Coast Guard the ability to provide feedback at an early stage of design:

- Project schedule including design, production, testing and delivery of the Replacement Bearings.
- Shipyard specification and project plan. The Contractor must visit and inspect the vessel's existing arrangement and configuration and consult any required existing documentations and drawings in order to develop a valid, accurate and reliable Shipyard specification and project plan as defined in 6.1.2. The shipyard specification and project plan will clearly delineate the implementation work to be conducted by the Contractor and that

to be conducted by the shipyard;
- Document and Drawing Management Plan;
- Integration Management Plan for new and retained systems and components;

6.1.2 ADP SHIPYARD SPECIFICATION AND PROJECT PLAN

The Contractor's ADP shall include, as a minimum, the following Shipyard Installation Instruction requirements:

- Identify all work that is to be conducted by the Contractor, including in-situ machining of shaft journals, supervisory activities and responsibilities, inspections, testing, and commissioning.
- Identify all work that is to be conducted by the shipyard.
- Prepare a project schedule identifying the sequence and expected duration of all installation activities, including those of the Contractor and those of the shipyard. Shipyard activities durations are to be determined from the Contractors' expertise with oversight of similar projects.
- Prepare an inspection and test plan identifying inspections and tests to be conducted during the installation and commissioning.
- Prepare a specification to be used by the Crown for a shipyard to install the newly supplied shaft bearings. This shall include enough detail to allow a shipyard to provide a firm price quotation, labour and materials, for all modifications required to modify the existing pedestals to suit the new shaft bearing. A detailed bill of materials shall be provided with the specification.

6.2 SPARE PARTS AND TOOLS REQUIREMENT

The Spare Parts and Tools shall conform to the following requirements;

- The Contractor shall supply one (1) set of spare parts for each type of bearing, as recommended in the Contractor's proposal. As a minimum this shall include a complete set of bearing pads, temperature sensors and seals.
- The Contractor shall supply one (1) complete set of maintenance and overhaul specialty tools, as recommended in the Contractor's proposal.

6.3 QUALITY ASSURANCE INSPECTIONS

The Contractor shall submit a QA Inspections, Tests, and Trials Plan for the installation phase of the project no later than four (4) weeks after contract award.

6.4 COMMISSIONING TESTS AND TRIALS AGENDA

The Contractor shall be able to deliver the Set to Work Test and Trials agenda, planning and schedule no later than four (4) weeks after contract award.

6.5 FACTORY ACCEPTANCE TEST

The Contractor shall conduct Factory Acceptance Tests of the Replacement Shaft Bearings in the presence of the attending Classification Society. Contractor to include the Class surveyor cost in the bid.

6.6 TESTS AND TRIALS

The Contractor shall deliver the dock trials and sea trials plan for the Replacement Shaft Bearing and schedule no later than four (4) weeks after the contract award. These Tests and Trials will have to demonstrate the satisfactory operation of all components and functions to the requirements of Classification Society and TCMS.