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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

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Title - Sujet New Articulated Buoy Crane 12.5 MT New Articulated Buoy Crane 12.5 MT CCGS Judy LaMarsh	
Solicitation No. - N° de l'invitation F7044-221040/A	**Amendment No. - N° modif.** 001
Client Reference No. - N° de référence du client 20221040	**Date** 2023-02-20
GETS Reference No. - N° de référence de SEAG PW-$$MD-021-28935	
File No. - N° de dossier 021md.F7044-221040	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à** 02:00 PM Eastern Daylight Saving Time EDT **on - le** 2023-03-15 Heure Avancée de l'Est HAE	
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Byron, Dan	**Buyer Id - Id de l'acheteur** 021md
Telephone No. - N° de téléphone (819) 420-2898 ( )	**FAX No. - N° de FAX** ( ) -
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Canada

Solicitation Amendment # 1 is issued to:

1) introduce the questions and answers received into the solicitation
2) Re-distribute the available drawings
3) Remove Annex A, Section 4.3.1.1 (f)
4) Modify Annex A, 4.0 Technical Requirements, Section 4.1.5 FSR Response Time requirement in Annex A to 24 hours
5) Modify Annex A, Section 4.5.1, Environmental and Operational Condition Requirements
6) Modify Annex A, Section 4.6.1, Minimal Lift Requirements
7) Modify Annex A, Section 2.3 Acts, Regulations, Standards, Rules, Codes and Guidelines
8) Modify Annex A, Section 2.4 Regulations Pursuant to the Canada Shipping Act 2001
9) Modify Annex A, Section 2.7 TCMSS Technical Publications (TP)
10) Modify Annex A, Section 2.8 Bureau Veritas Applicable Rules and Codes
11) Modify Annex A, Section 4.1.4
12) Replace Annex E - MANDATORY TECHNICAL EVALUATION CRITERIA

1) introduce the questions and answers received into the solicitation

Add:

Question number	Question	Answer
1	From the requirement below from Annex A, Section 4.6 we have assessed the crane required to complete the minimum lift requirements in the Seastate as listed in the excerpt from 4.6. The maximum lifting moment will exceed 1913 kNm. We would like to verify that this is acceptable. We cannot determine that from 4.6	Canada will re-examine the lifting moment requirement and get back to the bidders shortly.
2	Would it be possible to get a stand alone copy of the vessel drawings attached to the above noted tender? The drawings included in the tender – we can't read the details.	Canada will include the available drawings.
3	REF: 4.3.1.1 (f) : Can Canada remove requirement 4.3.1.1 (f) automatic motion compensated. It is a requirement that only afew manufacturer can supply, It makes the bid non- competitive.	Canda agrees to remove requirement 4.3.1.1 (f) for automatic motion compensation .

2) Re-distribute the available drawings

NOTE: Canada included pdf's of the available drawing as separate attachments.

3) Remove Annex A, Section 4.3.1.1 (f)

Delete (In it's entirety). Annex A. section 4.3.1.1 (f)

4) Modify Annex A, Section 4.1.5 - FSR Response Time to 24 Hours

Delete (in its entirety) : Annex A, section 4.1.5

Add/Insert: Annex A, section 4.1.5

4.1.5 The deck Crane being proposed must, at a minimum, be in current production, in current marine service, and be well supported across Canada and specifically in the Ontario Great Lakes Region. The successful Supplier must be capable of providing qualified field representatives, within a response time of twenty-four **(24) hours**, to a service call aboard the vessel when it is operating within the Great Lakes Area. The Supplier and its service technicians must have the capability of being able to perform normal overhauls and repairs and provide thorough documentation support.

5) Modify Annex A, Section 4.5.1 - Environmental and Operational Condition Requirements

Delete (in its entirety)Annex A, section 4.5.1

Add/Insert: Annex A, section 4.5.1

4.5.1 The proposed marine Crane must, at a minimum, meet the following environmental and operation requirements:

a) Operate within the lowest/highest mean daily air temperatures: -30°C to + 40°C.

b) Critical lift at combined pitch and heel in World Meteorological Organization (WMO) sea state three (3) with a wind speed (based on Pierson-Moskowitz spectrum) of **twenty (20) knots 10.3 m/s.**

6) Modify Annex A, Section 4.6.1 - Minimal Lift Requirements

Delete(In Its Entirety) Annex A, section 4.6.1

Add/Insert Annex A, section 4.6.1

4.6 Minimal Lift Requirements

4.6.1 The following are the crane's minimal lift requirements derived from its operational requirements:

a) Critical lift at combined pitch and heel in World Meteorological Organization sea state three (3) with a wind speed (based on Pierson-Moskowitz spectrum) of twenty-five (25) knots (12.86 m/s);

b) Minimum rated reach at 147 kN {12.5 tonnes · 9.81 m/s2} live load is 13.0 m in WMO sea state three (3);

c) The crane must be engineered to withstand the dynamic forces and shock loading when lifting buoys in WMO sea state (3) at its designed SWL of 12.5 Metric Tonnes and it must also remain functional in up to sea state five (5) at an acceptable reduced capacity.

7) Modify Annex A, Section 2.3 Acts, Regulations, Standards, Rules, Codes and Guidelines

Delete(In Its Entirety) Annex A, section 2.3

Add/Insert Annex A, section 2.3

2.3 Acts, Regulations, Standards, Rules, Codes and Guidelines

2.3.1 The articulated Crane being supplied must meet the Acts and Regulations in accordance with the Canada Shipping Act 2001 and the requirements of the designated "Class" and comply with the most recent and current Regulations, Standards, Guidelines and Codes referenced herein.

2.3.2 The SOLAS (Safety of Life at Sea) Convention applies as referenced in the Regulations under the Canada Shipping Act 2001 and as applicable for a government Vessel on noncommercial service.

2.3.3 The crane must meet the Requirements of the Canada Labour Code and applicable Regulations.

8) Modify Annex A, Section 2.4 Regulations Pursuant to the Canada Shipping Act 2001

Delete(In Its Entirety) Annex A, section 2.4

Add/Insert Annex A, section 2.4

2.4 <u>Regulations Pursuant to the Canada Shipping Act 2001</u>

2.4.1 The following table is a list of applicable Acts and Regulations that are pertinent to this procurement. The Supplier is to note that this is not to be seen as a finite listing and any other applicable Acts and Regulations that are required, but not noted herein, is the responsibility of the Supplier to ensure that it is being met.

Ref	Regulation s pursuant to Canada Shipping Act 2001
A	Cargo Fumigation and Tackle Regulations, Part 3
B	SOLAS II-1
C	Draft Vessel Construction and Equipment Regulations (when they come into force) [Published in the Canada Gazette I, (Volume 156 number 44) on October 29 ,2022]
D	Regulations Pursuant to the Canada Labour Code
E	Maritime Occupational Safety and Health Regulations

2.4.2 Any requests for exemptions to the CSA 2001 Regulations/IMO Conventions/ IMO Codes are subject an MTRB decision by TCMSS. Any exemption or equivalency identified or being proposed by the Supplier must be brought to the attention of the Canadian Coast Guard which may, after consideration, make application for an MTRB to TCMSS through BV.

9) Modify Annex A, Section 2.7 TCMSS Technical Publications (TP)

Delete (In its entirety) Annex A, section 2.7 TCMSS Technical Publications (TP)

Add/Insert: Annex A, section 2.7 TCMSS Technical Publications (TP)

2.7 TCMSS Technical Publications (TP)

2.7.1 Technical Publications (TP's) referenced in part or their entirety within a Regulation are considered as a mandatory requirement under the Regulation.

Ref	TCMSS Technical Publication (TP)
A	TP 3231 – Ship Safety Bulletins
B	TP 7301 – Stability, Subdivision and Load Line Standards (as updated)

10) Modify Annex A, Section 2.8 Bureau Veritas Applicable Rules and Codes

Delete (in Its entirety) Annex A, section 2.8 Bureau Veritas Applicable Rules and Codes

Add/Insert: Annex A, section 2.8 Bureau Veritas Applicable Rules and Codes

2.8 Bureau Veritas Applicable Rules and Codes

2.8.1 The Vessel is delegated and 'in-Class' with BV. The crane will be required to meet all applicable BV Rules or equivalent Classification Societies Rules for lifting appliances accepted by Bureau Veritas, TCMSS and Canada.

Ref	Bureau Veritas Rules
A	NR526 - Guide for Certification of Lifting Appliances. In particular the rules applicable for Offshore Cranes and Subsea lifting apply.
B	NR467 - Rules for Classification of Steel Ships
C	NR266 - Requirements for survey of materials and equipment for the classification of ships and offshore units (NR266)
D	NR476 - Approval testing of welders
E	NR527 - Rules for the classification of ships operating in polar waters and icebreakers
F	NR669 - Recognition of non-destructive testing suppliers (NR669)

11) Modify Annex A, Section 4.1.4

Delete (In Its Entirety) Annex A, Section 4.1.4

Add/Insert: Annex A, Section 4.1.4

4.1.4 The new Crane being supplied must be “Class” approved, meet all the requirements of TCMSS Regulations, and be designed and built with all requisite safety factors applied to achieve the necessary “Class” and TCMSS marine application approval. **The crane must meet the requirements of BV Guide for Certification of Lifting Appliances (NR526) including the rules applicable for Offshore Cranes and Subsea lifting (or be accepted by BV as equivalent).**

12) Replace Annex E - MANDATORY TECHNICAL EVALUATION CRITERIA

Delete (in its entirety) Annex E - MANDATORY TECHNICAL EVALUATION CRITERIA

Add: Annex E - MANDATORY TECHNICAL EVALUATION CRITERIA (rev 1)

ANNEX E – MANDATORY TECHNICAL EVALUATION CRITERIA (rev 1)

The following requirements are the mandatory technical evaluation criteria which will be evaluated during the Bid Evaluation.

Although the Bidders must propose products that meet all the specifications described in the Annex A, bids will be evaluated on the following technical requirements. Regardless of the content of the information provided, if the Bidder is awarded a Contract, work must be done in accordance with Annex A - Technical Statement of Requirement.

The technical bid must address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Any bid that does not clearly demonstrate compliance with each of the mandatory technical requirements listed below will be considered non-responsive.

Bidders are requested to cross reference the mandatory technical criteria in a concise format by using page, paragraph(s) and sub-paragraphs as applicable to their supporting technical documentation.

The Bidders must provide evidence describing how their proposed crane meet all listed requirements, in accordance with the Annex A and must reference where this evidence is located within their technical documentation.

Canada may require that the Bidder provide additional certification to demonstrate any features, functionality and capabilities described in this bid solicitation or in its bid, in order to verify compliance with the requirements of this bid solicitation.

TSOR Reference	Performance Requirements	Compliant (Yes/ No)	Location of information in bid
	CRANE TYPE REQUIREMENTS		
4.1.5	The successful Supplier must be capable of providing qualified field representatives, within a response time of twenty-four **(24) hours**, to a service call aboard the vessel when it is operating within the Great Lakes Area.		
4.1.6	The new Crane being proposed must be marine designed, certified by Class, be robust, have proven reliability, designed to be supportable both in parts and field service support, and capable of accomplishing its design parameters for not less than fifteen (15) years.		
4.3.1.1 (a)	A marine hydraulicly articulated knuckle boom crane.		

4.3.1.1 (b)	Slewing control cab;		
4.3.1.1 (c)	Designed for mounting on a pedestal that would allow a twelve (12) meter high hook height above deck;		
4.3.1.1 (d)	Hydraulics supply and returns internal to the pedestal;		
4.3.1.1 (e)	Simultaneous proportional variable speed operation of all movements (slew, luff, hoisting, and jib movement);		
4.3.1.1 (g)	Crane must be fitted with a remote operating pack that can manipulate the primary crane functions from anywhere on the working deck.		
4.3.1.1 (h)	The entire control system must be easily operated by one person from one location.		
4.3.1.2 (a)	Main and auxiliary hook continually variable line hoisting and lowering of any lift with automatic and variable proportional control breaking and hoisting anti-double blocking safety protection with a main hook lifting speed at 12.5 tonnes of between zero (0) and twenty-five (25) meters per minute and a main hook lifting speed at “no load” of zero (0) to thirty-five (35) metres per minute;		
4.3.1.2 (b)	Unlimited slewing angle and continually variable rotational rate of at least half a revolution per minute for all lifts.		
4.3.1.2 (c)	Rotation-resistant galvanized hoist wire, with a wire length sufficient to extend to full crane height and operate the hook 4.4 meters below the deck.		
4.3.1.2 (d)	Safe working load markings clearly marked on the crane;		
4.3.1.2 (e)	Fitted with hooks that meet or exceeds the safe working load marked on each load point;		
4.3.1.2 (f)	Fitted with down stop interlock to prevent winch drum operation with less than five (dead) wraps of cable remaining;		
4.3.1.2 (g)	Electrical connections in accordance with IEC standard 60529 IP66 or NEMA 6;		
4.3.1.2 (h)	Motors fitted with anti-condensation heater(s).		
4.3.1.2 (i)	Must have the capability of having integrated control of Deck machinery to include as a minimum the chain handling winch and if possible, the deck tugger winches.		
4.4.1 (a)	Load and Moment Indication system for the main and auxiliary hoists, including:Digital readout of loads on all hoists in tonnes, Digital readout of boom moment in % maximum, A 90% load and/or moment audible and visual warning and An overload audible and visual alarm.		
4.4.1 (b)	Automatic Overload Protection Systems and Manual Overload Protection Systems in accordance with Class rules.		
4.4.1 (c)	Emergency load lowering system.		

4.4.1 (d)	Anti-two (2) block control on all winches.		
4.4.1 (e)	Fail safe brakes for the winches and slewing motors		
4.4.1 (f)	Load holding valves for the luffing cylinders, winch motors, and slewing motors to prevent Crane movement in the case of hose rupture or other failure causing an unwarranted pressure-drop in the system		
4.4.1 (g)	Slewing sensors which set turn limits in connection with the boom luffing position.		
4.5.1 (a)	Be able to operate within the lowest/highest mean daily air temperatures: -30ºC to + 40ºC		
4.5.1 (b)	Critical lift at combined pitch and heel in World Meteorological Organization (WMO) sea state three (3) with a wind speed (based on Pierson-Moskowitz spectrum) of twenty (20) knots (10.3 m/s)		

	MINIMAL LIFT REQUIREMENTS		
4.6.1 (a)	Critical lift at combined pitch and heal in World Meteorological Organization sea state three with a wind speed (based on Pierson-Moskowitz spectrum) of 25 knots (12.86 m/s);		
4.6.1 (b)	Minimum rated reach at 147 kN {12.5 tonnes · 9.81 m/s2} live load is 13.0 m in WMO sea state three (3);		
4.6.1 (c)	The crane must be engineered to withstand the dynamic forces and shock loading when lifting buoys in WMO sea state (3) at its designed SWL of 12.5 Metric Tonnes and it must also remain functional in up to sea state five (5) at an acceptable reduced capacity.		

	SWL REQUIREMENTS		
4.7.1.1	The Crane Main Hoist shall possess a 12.5 tonnes SWL at a radius of 0.5m outboard of buoy working station in Sea State 3		

	MAIN HOIST REQUIREMENTS		
4.7.1.1 (a)	Main hook lifting speed @ 12.5 tonnes of 0 – 25 m/min.		
4.7.1.1 (b)	Main hook lifting speed @ no load of 0 – 35 m/min.		
4.7.1.1 (c)	Length and location of the main hoist must be such that simultaneous topping and slewing functions can be done with a 9 1/2 foot light and whistle buoy or 1.3m ELA buoy suspended from the hoist during recovery or replacement operations.		
4.7.1.1 (d)	Must maintain ten (10) tonnes SWL at four (4) to five (5) m past Buoy Working station in Harbour conditions.		

	AUXILIARY HOIST REQUIREMENTS		
4.7.2.1	The Crane must possess one Auxiliary Hoist which each shall possess a 6.25 tonnes SWL and meet the following requirements.		
4.7.2.1 (a)	Lifting speed @ 6.25 tonnes of 0 – 35 m/min		
4.7.2.1 (b)	Lifting speed @ No load of 0 – 50 m/min.		

	CRANE'S FUNCTIONAL REQUIREMENTS		
4.7.3.1	Where there is one auxiliary hoist fitted, any combination of two (2) hoists may be in use at any given time. At no point will the total load exceeds the SWL associated with the Main Hoist loading chart		
4.7.3.1 (a)	The horizontal separation between any two adjacent hoists at the working angle must be a minimum of 1.5m.		
4.7.3.1 (b)	The location of the whip should be such that the effective lift height over the deck is at least twelve (12) meters.		
4.7.3.2	With excessive loads above the design loads, an Alarm system must give an audible warning before the limits are reached. The Crane must come with the following protection system:		
4.7.3.2 (a)	Automatic Overload Protection System		
4.7.3.2 (b)	Manual Overload Protection System.		
4.7.3.2 (c)	Anti-two block.		
4.7.3.2 (d)	Emergency stops.		
4.7.3.3	The crane must come equipped with a load monitoring system, with Load measuring to be on the winch drums. The Alarm system must not lock out the control entirely and be easily reset or over-ridden for the purpose of securing a load or lowering it back to the deck or water		

	BOOM REQUIREMENTS		
4.7.4.1	The crane's boom must have sufficient reach to meet the following parameters:		
4.7.4.1 (a)	Capability of positioning the Main Hoist plumb over all necessary heavy lifting locations.		
4.7.4.1 (b)	Capability of lifting 12.5T at 0.5 meters outboard of Buoy working station Port and Starboard		
4.7.4.1 (c)	c) Capability of plumbing over all five (5) Container ISO pads.		
4.7.4.2	The Boom must be capable of operating at a tilt angle ranging up to 10° from the vertical caused by the buoy while being lifted, a working height clearance of two (2) metres over the working deck from the bottom of the buoy being lifted.		
4.7.4.3	The Boom must be capable of rotating 360 degrees with any limits on slewing to be programmed in for combined azimuth and topping height to maintain a one (1) meter clearance from structure.		
4.7.4.4	The Boom must come fitted with sufficient flood lights to illuminate the deck area being worked from the crane cab to the tip of the boom, without negatively effecting the operator's vision.		
4.7.4.5	The Boom must come fitted with sufficient flood lights to illuminate the deck area being worked from the crane cab to the		

	tip of the boom, without negatively effecting the operator's vision.		

	WINCH REQUIREMENTS		
4.7.5.1	All winches must be self-spooling or fitted with mechanical spooling gear with good reliability when the crane system is in use.		
4.7.5.2	Wire attachments to winch barrels must be tapered fit to allow immediate release in an emergency situation.		

	CONTROL STATION REQUIREMENTS		
4.7.6.1	The control system(s) for the Crane must be designed for use in a marine environment and under the environmental conditions given at Section 4.5 Environmental and Operational Conditions Requirements.		
4.7.6.2	The control system(s) must utilize current production electronic components, standardized Programmable Logic Controllers (PLC) with the control system being designed to allow control PLCs to be interchanged with the minimal adjustments		
4.7.6.3	The control system(s) must be capable of performing self-diagnostics to detect, identify, locate, and indicate to the operator/maintainer any fault(s) that has occurred in the control system, including control hardware and sensors.		
4.7.6.4	The Crane's Control System(s) must be upgradable to allow for the future installation of a control package where the Crane's Operator is capable of taking/accepting control of the Deck Tugger winches and/or the Chain Handling winch. This additional Control Package is expected to be fitted during the crane's installation as part of vessel's conversion project and in conjunction with the new deck machinery fitted at that time. The main Crane functions are required to be fitted within joy-stick style interfaces. Tugger/Chain winch controls do not necessarily need to be on the joy-sticks but must be operable simultaneously		
4.7.6.5	The control system(s) must provide diagnostic messages/indications presented in clear language and graphically presented on the user interface display screen.		
4.7.7.3	An LCD colour monitor must be fitted which incorporates the following design elements:		
4.7.7.3 (a)	Automatic contrast adjustment (sunlight visible)		
4.7.7.3 (b)	Self-diagnostic capability including maintenance software		
4.7.7.3 (c)	Come complete with either a touch screen or a function button system to allow the operator to quickly change display pages, in groupings according to function, such as:		
4.7.7.3 (c,i)	Operational overview page – loads, trim, list, wind, status of safety systems, etc.		
4.7.7.3 (c,ii)	System status page(s), in both official languages – i.e., pressures, temperature readings, etc.		
4.7.7.3 (c,iii)	Maintenance information page (hour-meters, etc.)		
4.7.7.3 (d)	Configuration of set points, alarms, and anti-collision settings; and		
4.7.7.3 (e)	Alarms, faults, and warning listing page		
4.7.7.4	The operator must have a clear, unobstructed view of the work deck area, boom, hook, and load at all times.		

CONTROL CABIN FIT-OUT REQUIREMENTS			
4.7.8.1	The Control/Operator's Cabin (COC) must be ergonomically designed and meet the following requirements		
4.7.8.1 (a)	The COC must be weather tight		
47..8.1 (b)	The cabin door must be lockable, weatherproof, and provided with adjustable latches/dogs/gaskets such that it is able to exert pressure on the door seal.		
4.7.8.1 (c)	The COC must be provided with sufficient windows to maximize an unobstructed view of the load and working deck areas, including:		
4.7.8.1 (c,i)	The fixed windows in front of the operator's position and the upper window must have tinted safety glass, fitted with motorized windshield wipers, electric defrost, and window shades. The upper window must provide viewing angles sufficient to observe the highest possible elevation of the main boom. The lower window must provide viewing angles as low as is practicable.		
4.7.8.1 (c,ii)	Have safety bars mounted on the exterior of the fixed windows in front of the operator's position and the upper window.		
4.7.8.1 (c,iii)	Windows on the left and right sides of the operator's position, and in the door, are to have tinted safety glass and be fitted with window visors and or blinds. At least one window is to be openable to allow fresh air ventilation.		
4.7.8.1 (d)	Ergonomic joystick operator controls for all Crane movements are to be provided, c/w an adjustable operator's chair.		
4.7.8.1 (e)	The controls being supplied are to be "step-less" controls from zero to maximum speed		
4.7.8.1 (f)	Controls must include:		
4.7.8.1 (f,i)	The remote start and stopping of the hydraulic power pack(s),		
4.7.8.1 (f,ii)	Signal horn; and		
4.7.8.1 (f,iii)	Emergency release control.		
4.7.8.1 (f,iv)	Heating and defrost system		
4.7.9	Instrumentation fitted is to provide the operator with operational information from the Crane safety systems (load and radius indications), system pressure and temperature indications, hour-meters, and alarms for abnormal conditions		
4.7.10	The COC must be provided with thermal and sound insulation as practicable that will meet the environmental requirements and will dampen the noise level at the operator's position to not more		

	than 75 dB, while the Crane is in operation and with all windows and doors closed.		
4.7.11	All interior surfaces of the COC must be capable of withstanding oils and solvents common to ships and must be easy to clean. Surfaces forward of the operator must be non-reflective. Interior flooring is to have a non-skid surface.		
4.7.12	The OC must be fitted with mechanical ventilation and a thermostatically controlled heater and air conditioner to maintain an average temperature of 20 degrees Celsius when the outside temperature is between -40ºC and 40ºC.		
4.7.13	In addition to the above requirements, the Supplier must also provide and have installed in the Control Cabin the following		
4.7.13 (a)	Fitted with an internal/dimmable lighting system and one (1) 220 VAC, and one 120 VAC ,60 Hz, 15-amp marine styled electrical outlets		
4.7.13 (b)	Provided with a loudspeaker talkback system for communication with the working deck;		
4.7.13 (c)	Provision for mounting a permanent VHF radio.		
4.7.13 (d)	One fixed telephone connection to allow connection to the ship's Internal Communication System		
4.7.13 (e)	Provision for General Alarm notification both audible and visual.		
4.7.13 (f)	Fitted with a suitable portable ABC fire extinguisher in an easily accessible position; and		
4.7.13 (g)	Fitted with the Load Radius Charts for all hoists, indicating primary and secondary ratings. Charts are to be mounted in a prominent location inside the operator's cabin. Load Radius Charts must be supplied on either etched or engraved metal or other robust non-photo sensitive material and its lettering must be easily legible and be in English.		
4.7.14	The operator must have positive and effective communications at all times with the person in charge of the deck		
4.7.15	Must include a Talk Back System with loudspeaker for direct communications as well as ICS into ships phone systems and VHF Radio equipment		
4.7.17	Delays between controls and the crane must be kept to a minimum, the maximum delay not to exceed one second		

DRIVE SYSTEM REQUIREMENTS	

4.8.1	The drive system for the crane is to be an electro-hydraulic arrangement compatible with the power distribution system found on the Light Icebreaker The starting of the drive is to be carried out in a manner that reduces any peak loading of the switchboard, i.e., through the use of auto-transformer starters.		

	HYDRAULIC SYSTEM REQUIREMENTS		
4.8.2.1	The crane must be hydraulically operated by an internally mounted hydraulic power pack.		
4.8.2.2	The power pack must have redundancy designed into the system such that each movement has its individual hydraulic circuit with related safety overrides in conjunction with multiple (2) hydraulic pumps.		
4.8.2.3	The system must be protected by closed circuit relief valves.		
4.8.2.4	All external pipework and fittings exposed to the elements on the crane, boom and to control cabs are to be stainless steel or of corrosive resistant materials.		
4.8.2.5	All carbon steel piping and fitting are to be internal and wrapped in Denso tape. All piping is to be secured against vibration and pressure shock loading.		
4.8.2.6	The reservoir shall be of all welded structure and shall be equipped, as a minimum, with:		
4.8.2.6 (a)	Level gauge with low level alarm (visual and audio).		
4.8.2.6 (b)	Level gauge with low/low shut-off with trouble indicator.		
4.8.2.6 (c)	Local instrumentation with pressure and flow gauges, with test points installed at key locations throughout the system to facilitate trouble- shooting.		
4.8.2.6 (d)	Return (with full flow fine filter) and suction (with strainer) connections.		
4.8.2.6 (e)	Drain connections with block valves.		
4.8.2.6 (f)	Inspection and cleaning cover.		
4.8.2.6 (g)	Baffle between return and outlet points.		
4.8.2.6 (h)	Filler with fine mesh stainless steel strainer.		

	DETAILED OPERATIONAL REQUIREMENTS		
4.9.1	The system must be such that the working of both sides of the vessel is possible with equal capability.		
4.9.2	The crane system shall be engineered to withstand dynamic forces and shock loading when lifting buoys in WMO sea state three (3) at its designed SWL of 12.5 Metric Tonnes. It must remain functional in up to sea state five (5) at an acceptable reduced capacity.		
4.9.3	The crane must be designed to operate in the environment the vessel will encounter namely:		
4.9.3 (a)	Thirty-five (35) Knots wind in Harbour (0 meters wave height).		

4.9.3 (b)	All external fittings shall be capable of withstanding a constant maximum wind speed of 168km/h . (100Knts)		
4.9.4	The system must be capable of placing and lifting all buoys in the Canadian Buoyage System on the Great Lakes with 100% capability, and the handling of associated moorings and sinkers to and from any position on the work deck.		
4.9.6	The system must be capable of placing and lifting all ODAS buoys used on the Great Lakes and Quebec sector by Environment Canada and the associated moorings and sinkers to and from any position on the work deck.		
4.9.7	Able to position and control loads anywhere on the buoy deck and as much of the remaining Cargo Deck area as possible		
4.9.8	The Crane must be capable of lifting cargo, boats, barges, and other items as per program tasking		
4.9.9	The Crane being supplied must be a pedestal mounted, have 360º slewing capability and have an articulated (knuckle) main boom with a retractable jib boom. The pedestal must be of sufficient height to allow a twelve (12) meter high hook height above deck. The Crane must come equipped and fitted with a slewing operator's cabin. The pedestal, machinery, operator's cabin, main and jib booms must be enclosed and weather tight such that the potential for corrosion or other degradation is minimized.		
4.9.10	The pedestal must be high enough to allow for unincumbered rotation of the crane when a standard 8 ½ foot high shipping container(s) are locked in their respective locations in close proximity to the crane.		
4.9.11	The proposed Crane's sub-components, mounted in hard to access areas, must be arranged such that all components are accessible and visible for maintenance, adjustment, or repair. The Crane must be fitted with a centralized greasing location to reduce the need to physically access the entire Crane's structure. All greasing tubing and "Zerk" fittings are to be stainless-steel		
4.9.12	All winches being supplied, must consist of a grooved wire rope drum with integrated planetary gear(s), hydraulic motor, and fail-safe brakes. Winch drum capacities must be such that at least five (5) dead turns are guaranteed under any designed operating conditions		
4.9.13	The machinery and all fixed equipment must be self-contained, mounted above the slewing ring within a weather protected machinery house and/or within the pedestal. The operator's cabin must be mounted above the slewing ring and designed such that the operator's view is not restricted.		

	RIGGING REQUIREMENTS		
4.10.1	The Crane must be equipped with all hoist cables, sheaves, guides, and load hooks for each of the two (2) hoists.		
4.10.2(a)	All hook blocks must be weighted or fitted with overhauling balls such that they will freely overhaul from any operating configuration of the boom and jib-boom when the winch drum is veered		
4.10.2 (b)	All hook blocks must be Fitted with load sensing devices		
4.10.3	All hook blocks must be supplied with test certificates issued by the OEM and the approving recognized Classification Society		
4.10.4	All sheaves, including any sheaved blocks, must be guarded to prevent the wire rope from slipping off at maximum lead angles and all operational conditions		
4.10.5	The hoist cable must have the capability of still reaching a lift that is 4.4 metres below the water line, with the boom at full extension and at its maximum upward operating angle, when the vessel is at her summer load line		
4.10.6	Supplied wire rope must be galvanized non-rotating, right regular lay, and be of independent wire rope core (IWRC) construction and readily available in North America.		
4.10.7	All wire and rigging components supplied are to be pre-load tested and provided with material certificates.		

	PAINTING & CORROSION PROTECTION		
4.11.1	The Crane must come painted and with adequate corrosion protection to the industry's standard for marine class Cranes, but as a minimum the Crane must be supplied with a full paint application to the Crane's surfaces, both internally (i.e., internal boom sections) and externally to the following requirements:		
4.11.1 (a)	Grit blasting and degreasing of all structural elements, all grit blasting to be to SSPC-SP-10 standard.		
4.11.1 (b)	Using pure epoxy polyurethane or acrylic modified epoxy paints to the following standards:		
4.11.1 (b,i)	Organic epoxy zinc-plating primer 20-30 µ compatible with epoxy coatings		
4.11.1 (b,ii)	Bi-component epoxy priming coat at a DFT 50-60 µm		
4.11.1 (b,iii)	Bi-component polyurethane final painting at a DFT 50-60 µm		

4.11.1 (c)	Finish paint color of the Crane exterior must be beige/buff as per the requirements of CG document FC 08-2007 entitled Canadian Coast Guard Fleet Identity Colour Standard.		
4.11.1 (d)	All externally fitted valves, hydraulic fittings and connections must be protected by an anticorrosive treatment such as “Denso Tape” or equivalent.		
4.11.2	The Crane must be delivered with bottom 100 mm of the pedestal, including any attached stiffeners or other attachment points intended to be welded, prepared, and coated with an approved weldable primer only		

End of Solicitation Amendment #1