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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

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Marine Emergency Response Division/Division des
Interventions en cas d'urgence maritime
Centennial Towers 7th Floor - 7W11
200 Kent Street
Ottawa
Ontario
K1A0S5

Title - Sujet EREP: Ice Skimmer Package EREP: Large Offshore Ice Skimmer Package	
Solicitation No. - N° de l'invitation F7047-190147/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client F7047-190147	Date 2021-01-27
GETS Reference No. - N° de référence de SEAG PW-\$ERD-005-28045	
File No. - N° de dossier 005erd.F7047-190147	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Standard Time EST on - le 2021-02-16 Heure Normale de l'Est HNE	
F.O.B. - F.A.B.	
Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Richards, Shazia	Buyer Id - Id de l'acheteur 005erd
Telephone No. - N° de téléphone (343) 553-2046 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

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Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
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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Amendment 002

This amendment is raised to publish questions and answers as well as to modify the Technical Statement of Requirements (TSOR) - *see attached modified TSOR*.

Question 11 :

At what point do the Certifications and Material Data sheets (a-e), as specified in the Product Verification Plan (SOW), need to be provided?

Answer #11 : The Certifications and Material Data Sheets must be appended to the Quality Assurance Report of each applicable Ice Skimmer, as per DID-SE-05.

Question 12:

Is electric power available from the vessel? If so, please specify the AC and DC power available?

Answer 12: Electric power will not be available from the vessel.

Question 13:

TSOR B.3.2: *The Ice Skimmer head's primary oil recovery mechanism must be, at a minimum, capable of recovering oils and bitumen of at least 540,000 centistokes (cSt).*

Please confirm the temperature in which the oil retains a rating of 540,000 cSt. Is a viscosity chart available for analysis?

Answer 13: The Ice Skimmer will be used to collect various types of oils at various temperatures and at various viscosities. As per TSOR requirements A.1 and A.2, the skimmer will be used in temperature ranges of -20°C to +40°C (ambient air) and -2°C to +25°C (water). For the purposes of requirement B.3.2, the temperature is not specified.

Question 14:

TSOR B.3.5: *The Ice Skimmer head must incorporate floatation elements to allow for operation while free floating. The Ice Skimmer must be capable of operating up to 70 m from the deployment vessel. The floatation elements must be designed to minimise the footprint of the skimmer head in the water.*

If the skimmer is required to be operated 70 metres away from the vessel, are thrusters or a method of skimmer self-propulsion required in order to effectively align the skimmer and floating hose during deployment/operation. In addition, skimmer propulsion is key to position the skimmer in pockets of oil within the ice pack without having to re-position the vessel (which directly affects the ice pockets).

Answer 14: Thrusters are an acceptable and even preferable addition to the Ice Skimmer, however they are not required by the TSOR.

Question 15:

TSOR B.3.8: *The Ice Skimmer head recovery efficiency must be at least 90% when operating at full capacity for each of the following oil types:*

- a) Light oil, such as diesel or jet fuel;*
- b) Medium oil, such as lube or fresh crude oil; and*
- c) Heavy oil such as bunker C and bitumen.*

Are different oil recovery modules (ie. Brush, Disc, Drum) required to effectively recover the range of oils?

Answer 15: Different recovery modules are not required by the TSOR. It is up to the bidder to determine what and how many recovery module(s) may be necessary to meet the requirements of the TSOR.

Question 16:

TSOR B.4.3: *The power supply of the hydraulic power unit must be diesel and must satisfy the Tier 4 emission standards referenced in SOR/2005-32, Off-Road Compression-Ignition Engine Emission Regulations.*

Due to the storage and operational requirements, would electric power be considered for the hydraulic power unit? If the vessel has electric power available, an electric motor has considerable advantages in comparison to a diesel engine including but not limited to storage, power consumption, noise, maintenance, etc.

Answer 16: Electric power from the vessel will not be available. Diesel engines must be used to power all of the equipment in the Ice Skimmer package.

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Question 17:

TSOR B.5.4: *All hose assemblies that connect to the Ice Skimmer head must be bundled together in an umbilical hose.*

TSOR B.5.5: *The umbilical hose must be capable of maintaining buoyancy during skimmer head deployment, including when the oil transfer hoses are full.*

Confirm that the requirement is for a self-floating hose and that external hose floats are not allowed.

Answer 17: Yes the umbilical hose must be self-floating.

TSOR Amendment:

MODIFY TSOR B.5.5 to read: *The umbilical hose must be self-floating and capable of maintaining buoyancy during skimmer head deployment, including when the oil transfer hoses are full.*

Question 18:

TSOR B.6.1: *One hydraulically powered reel must be supplied to hold, deploy and recover the umbilical hose during operation and storage.*

Please confirm that it is required that the skimmer is fully operational during deployment and recovery of the floating hose. The hoses connected to the hose reel (hydraulic and oil transfer) must remain connected during operation (ie. the crew does not need to disconnect the hoses from the reel in order to rotate the hose reel).

Answer 18: Yes, the skimmer must be fully operational during the deployment of the hose. The Skimmer must be able to function and collect oil while a portion of the hose is still on the reel.

TSOR Amendment: *This requirement was updated in the previous RFP amendment. It now reads "One hydraulically powered reel must be supplied to hold, deploy and recover the umbilical hose during operation and storage. The reel must allow for the skimmer to operate and collect oil while the hose is still on the reel."*

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Question 19:

TSOR B.6.2 : *The hydraulically powered reel must be on a slue (or swivel) gear to allow reel to turn for alignment of the umbilical hose during deployment and recovery operations.*

Please confirm if the rotation of the hose reel base must be hydraulically powered or manually powered.

Answer 19: As per requirement B.6.2, the hose reel must be hydraulically powered.

Question 20:

TSOR B.6.3: *One steam generator must be supplied as part of the Ice Skimmer Package. The steam generator must be sized to produce the amount of steam/hot water required by the Ice Skimmer Package for operation.*

Please specify the desired power source of the steam generator. Diesel/electric? Gas/electric? Electric?

Answer 20: The steam generator must be diesel powered.

TSOR Amendment:

MODIFY TSOR B.6.3 to read: *One diesel-powered steam generator must be supplied as part of the Ice Skimmer Package. The steam generator must be sized to produce the amount of steam/hot water required by the Ice Skimmer Package for operation.*

Question 21:

TSOR B.6.3: *One steam generator must be supplied as part of the Ice Skimmer Package. The steam generator must be sized to produce the amount of steam/hot water required by the Ice Skimmer Package for operation.*

Does the steam generator also need to provide the hot water to inject on the skimmer's oil transfer pump or is the hot water provided by the vessel?

Answer 21: The steam generator will serve to provide the hot water used for injection into the oil transfer pump.

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Question 22:

TSOR B.7.1: *All Ice Skimmer Package components must be stored in 10 foot ISO containers that adhere to the dimensions of a 1D container as specified in ISO 668: Series 1 freight containers – Classification, dimensions and ratings. Should the Ice Skimmer components not fit in one 10 foot ISO container, then multiple 10' ISO containers must be provided to hold all the components.*

TSOR B.7.2: *The open top ISO containers must follow the requirements defined in ISO 1496-1 : Series 1 freight containers - Specification and testing – Part 1: General cargo containers for general purposes.*

TSOR B.7.3: *All provided ISO containers must be supplied with a completely removable hard top that can be locked into the container. The removable top must have evenly spaced, non-protruding lifting point, to allow for removal by crane.*

Please clarify the desired method to transfer the equipment from storage to operation. Is the method to open the top of each container and then lift each component (skimmer, hose reel, HPU and steam generator) onto the deck for operation?

Answer 22: Once the containers have been secured on the ship deck, the components of the Ice Skimmer Package will be moved from and to the container with the use of the ship crane through the opening left by the removable hard top.

Question 23:

TSOR B.7.1: *All Ice Skimmer Package components must be stored in 10 foot ISO containers that adhere to the dimensions of a 1D container as specified in ISO 668:Series 1 freight containers – Classification, dimensions and ratings. Should the Ice Skimmer components not fit in one 10 foot ISO container, then multiple 10' ISO containers must be provided to hold all the components.*

Due to the lack of availability of 10 foot containers that adhere to the specifications (open top, ISO1496-1), would 20 foot containers be acceptable?

Answer 23: 20 foot containers will not be acceptable. As per the requirements, the containers used for the Ice Skimmer Package must be 10 foot ISO containers.

Question 24:

TSOR B.8.1: *The hoisting slings must be provided with all the necessary hardware and components required to lift a storage with the use of an overhead crane.*

Please specify the wording of this clause. Are lifting slings required for the skimmer, hose reel, HPU, steam generator and storage container?

Answer 24: Lifting slings will only be used for the full containers. CCG will be using their own slings to move the skimmer head, hose reel, HPU and steam generator.

TSOR Amendment:

MODIFY TSOR B.8.1 to read: *The hoisting slings must be provided with all the necessary hardware and components required to lift a full Ice Skimmer Package storage container with the use of an overhead crane.*

Question 25:

Material of Fasteners. Typically, there is a clause stating: Unless otherwise specified by Canada, all fasteners, nuts, and similar hardware used must be Type 316 stainless steel. The Contractor may propose other stainless or high alloy steel(s) for consideration by Canada. Is this required?

Answer 25: The TSOR does not specify the material for the fasteners used in the Ice Skimmer Package. Type 316 stainless steel would be an acceptable material for this application.

Question 26:

Material of hydraulic fittings and hydraulic quick connects. Typically, there is a clause that states: All hydraulic fittings must be fabricated from stainless steel. Is this required?

Answer 26: The TSOR does not specify the material for the hydraulic fittings and quick connects used in the Ice Skimmer Package. Stainless steel would be an acceptable material for this application.

Question 27:

Material of hose couplings. Typically all camlocks are fabricated from stainless steel. Is this acceptable?

Answer 27: Stainless steel would be an acceptable material for camlocks.

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Question 28:

Welding requirements. Typically welding to CSA and CWB standards is required. Is this required for this Contract?

Answer 28: The contract does not specify welding requirements.

Question 29:

Quality Management. Must the bid demonstrate that the entity performing manufacturing and/or integration have a Quality Management System such as ISO 9001:2015 in place?

Answer 29: No, this does not have to be included in the bid evaluation criteria.

Question 30:

Project Management. Must the bid identify an experienced Project Manager who will manage the Project should the bid be successful? Are there requirements such as experience in the last 60 months, dealing with scheduling, changes, risks, resources and total contract values?

Answer 30: No, this does not have to be included in the bid evaluation criteria.

All other terms and conditions remain unchanged

Annex B

Technical Statement of Requirements

Environmental Response Equipment Modernization/Mobile Incident Command Equipment Project

Ice Skimmer Package

TECHNICAL STATEMENT OF REQUIREMENTS
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TECHNICAL STATEMENT OF REQUIREMENTS
ACRONYMS AND ABBREVIATIONS

LIST OF ACRONYMS AND ABBREVIATIONS

ASME	American Society of Mechanical Engineers
ASTM	Formerly known as the American Society for Testing and Materials
BHP	Brake horsepower
CCG	Canadian Coast Guard
ConOps	Concept of Operations
DD	Two-digit day
DWL	Design waterline
ER	Environmental response
GSA	General Services Administration
IIW-ANBCC	Institute of Welding – Authorized National Body for Company Certification
ISO	International Organization for Standardization
MBS	Minimum breaking strength
MM	Two-digit month
OEM	Original equipment manufacturer
RPM	Rotations per minute
SAE	Society of Automotive Engineers
SOR	Statutory Orders and Regulations
TSOR	Technical Statement of Requirements
UHMW	Ultra-high molecular weight
US	United States
UV	Ultraviolet
WLL	Working load limit
YYYY	Four-digit year

TECHNICAL STATEMENT OF REQUIREMENTS
INTRODUCTION

SECTION 1 INTRODUCTION

1.1. BACKGROUND

The Canadian Coast Guard (CCG) is the lead federal agency responsible for ensuring the clean-up of all ship-source and mystery-source pollution spills into waters under Canadian jurisdiction. In fulfillment of this legislated mandate, the CCG maintains operational preparedness capacity to monitor, investigate, and respond to all reports of marine pollution incidents. The object of the Environmental Response Equipment Modernization/Mobile Incident Command Equipment (EREM/MICE) Project is to modernize CCG's response equipment inventory and supporting infrastructure.

1.2. PURPOSE

The CCG requires high capacity skimming capability to recover spilled oil in offshore, unsheltered and ice covered waters. This Technical Statement of Requirements (TSOR) defines the performance requirements and technical specifications for the provision of the Ice Skimmer, hereinafter referred to as the "Ice Skimmer Package".

The Ice Skimmer Package will consist of the following **major** components:

- a. A skimmer head;
- b. A hose reel;
- c. A hydraulic power unit (HPU);
- d. Storage container(s);
- e. A steam generator;
- f. One bilingual hard-copy of the Operations and Maintenance Manuals in both of Canada's official languages i.e., English and French; and
- g. One bilingual hard-copy of the Equipment Instructions Illustration.

1.3. SCOPE

All requirements, specifications, and other indications in this TSOR pertaining to the Ice Skimmer Package also apply to each individual component of the Ice Skimmer Package, whether they are acquired together as a complete package, individually, or in any other combination.

1.4. DOCUMENT CONVENTION

The following conventions apply to this TSOR:

TECHNICAL STATEMENT OF REQUIREMENTS
INTRODUCTION

- a. Dimensions stated as nominal are treated as approximate dimensions. Nominal dimensions reflect a standard whereby materials or products are generally identified for commercial sale but differ from the actual dimensions.
- b. Both the metric system and the imperial system of measurements may be indicated in this TSOR. Conversions from one system of measurement to the other may not be exact.

1.5. DEFINITIONS

The following definitions apply to this TSOR:

Terminology	Definition
Accessible	Capable of being reached for use, inspection, and maintenance without the removal of permanent structural elements.
Equivalent	A standard, means, or component type, which Canada has approved for this requirement as meeting the specified requirements for fit and function.
Fully Operational	A quality of readiness whereby an item has been specifically designed to function or perform in the stated environmental condition(s).
Long-Term Storage	The storage of all listed components for a period of 30 consecutive days or longer in the specified conditions.
Marine-Grade	A quality of a product specifically formulated or treated to withstand use at sea.
Off-the-Shelf	Standard articles and materials that are ordinarily produced by manufacturers in the normal course of business.
Provided	The element in question must be delivered, installed, and integrated in a fully operational state.
Recovery Efficiency	Ratio, expressed as a percentage, of the volume of oil recovered to the volume of total fluids recovered.
Safety Factor	Number of times that a load can be increased before failure occurs.

SECTION 2 REFERENCE DOCUMENTATION

2.1. APPLICABLE STANDARDS AND REGULATIONS

The Ice Skimmer Package must conform to all applicable laws, regulations, and industrial standards governing manufacture, safety, noise levels, and pollution in effect in Canada at the time of manufacture. International equivalent laws, regulations, and industrial standards will be accepted only if certified for equivalency by a Professional Engineer.

The following standards and specifications apply to the Ice Skimmer Package:

- ASTM F625/F625M-94: Standard Practice for Classifying Water Bodies for Spill Control Systems.
 - ISO 2230: Rubber Products – Guidelines for Storage
 - ASTM F631-15: Standard Guide for Collecting Skimming Performance Data in Controlled Environments
 - ASTM F2709-15: Standard Test Method for Determining a Measured Nameplate Recovery Rate of Stationary Oil Skimmers
 - ASTM F962-04: Standard Specification for Oil Spill Response Boom Connection: Z-Connector
 - SOR/2005-3: Off-Road Compression-Ignition Engine Emission Regulations
 - ISO 668: Series 1 freight containers – Classification, dimensions and ratings
 - ISO 1496-1: Series 1 freight containers - Specification and testing – Part 1: General cargo containers for general purposes
 - ISO 7010: Graphical symbols – Safety colours and safety signs – Registered safety signs
-

TECHNICAL STATEMENT OF REQUIREMENTS
REFERENCE DOCUMENTATION

2.2. REFERENCE DOCUMENTATION VERSION

Unless otherwise specified by Canada, any amendment issued to the documents specified in section **Error! Reference source not found.** must reflect the version in effect on the date of Contract Award.

2.3. ORDER OF PRECEDENCE

In the event of a discrepancy between this TSOR and the documents referenced herein, the Contractor must adhere to the following order of precedence:

- a) Canadian Regulations;
 - b) This TSOR; and
 - c) Industry and other applicable standards and specifications.
-

SECTION 3 ICE SKIMMER PACKAGE REQUIREMENTS

3.1. DESIGN OVERVIEW

3.1.1. GENERAL CONSIDERATIONS

3.1.1.1. The Ice Skimmer Packages must be delivered complete, tested, and ready to use.

3.1.1.2. The selection of equipment, fittings, fasteners, hardware, attachments, and fabrication methods used in all Ice Skimmer Packages must be standardized to minimize the number of unique spares. Identical components must be used in all Ice Skimmer Packages, following Canada's design acceptance.

3.1.1.3. All equipment must be installed per the OEM installation recommendations.

3.2. OPERATIONAL REQUIREMENTS

The Ice Skimmer Package must meet the following operational requirements:

A.1	The Ice Skimmer Package must be fully operational in air temperatures ranging from -20°C to +40°C and when subjected to rain, sleet, snow, and ocean spray during transportation, operational deployment, and storage.
A.2	The Ice Skimmer Package must be deployable in water temperatures ranging from -2°C to +25°C in both fresh water and salt water environments.
A.3	The Ice Skimmer Package must be fully functional after being stored for extended periods of time in environments with an ambient air temperature ranging from -40°C to +40°C.
A.4	The Ice Skimmer Package must be fully operational in arctic waters with up to 70% ice coverage for both floating ice and slush ice.
A.5	The Ice Skimmer Package must be fully deployable and operational in waters classified as Type III-Open Water in ASTM F625/F625M-94 (2017), Standard Practice for Classifying Water Bodies for Spill Control Systems. Type III-Open Waters are equivalent to wave heights ≤ 2 metres (m) or Beaufort Force 4 sea conditions.
A.6	The Ice Skimmer Package must be deployable, operable and retrievable by a maximum of 2 personnel, with the assistance of a crane or a davit.
A.7	The Ice Skimmer must be operable by a remote control stand or by tethered control up to 20 ft.
A.8	The Ice Skimmer must be deployable and retrievable from a ship deck or dock with a freeboard of up to 5 m.

ICE SKIMMER REQUIREMENTS

3.2.1. ICE SKIMMER

The Ice Skimmer Package must meet the following requirements:

B.1 General Requirements

B.1.1	The Ice Skimmer Package must have a shelf life/storage life, under controlled storage conditions, of at least twenty (20) years.
B.1.2	All components of the Ice Skimmer Package that will go into the water during the course of normal operations must be abrasion resistant to prevent damage from floating debris or ice. All components of the Ice Skimmer Package must be of durable and robust construction.
B.1.3	All components of the Ice Skimmer Package must be provided with a means of rapid and simple shut down in emergency situations.
B.1.4	The minimum safety factor of all hoisting points (and the adjacent support structure) must be at least 6-to-1; i.e., the ratio of the minimum breaking strength (MBS) to the working load limit (WLL). Design calculations supporting the safety factor of all hoisting points must be certified by a licensed engineer as per DID-SE-01, Detailed Design Package.

TECHNICAL STATEMENT OF REQUIREMENTS
ICE SKIMMER PACKAGE REQUIREMENTS

B.2 Identification and Markings

B.2.1	The vendor must provide a unique product identifier for each component of the Ice Skimmer Package. The product identifier must comply with the following format: ABCD-DD-MM-YYYY-Manufacturer's Serial #. Proposed product identifier is subject to Canada's acceptance.
B.2.2	Label plates in both Canadian English and French must be used to identify each control, switch, gauge, and display. Label plates must also be used to indicate safe working limits, maximum capacities, and masses of equipment.
B.2.3	Label plates must be manufactured to last a minimum of 20 years under typical use.
B.2.4	The Ice Skimmer Package must indicate all hazards with both Canadian English and French warning labels or clear graphical symbols per ISO 7010, Graphical symbols – Safety colours and safety signs – Registered safety signs.
B.2.5	The Ice Skimmer Package must include an Equipment Instruction Illustration as per DID-TM-04, Equipment Instruction Illustration.
B.2.6	The content and arrangement of all label plates and of the Equipment Instruction Illustration must be approved by Canada prior to installation.

B.3 Skimmer Head

B.3.1	The Ice Skimmer must have a rated oil recovery capacity of at least 100 cubic meters per hour (m ³ /h).
B.3.2	The Ice Skimmer head's primary oil recovery mechanism must be, at a minimum, capable of recovering oils and bitumen of at least 540 000 centistokes (cSt).
B.3.3	The Ice Skimmer must incorporate features to protect the oil collection mechanism from floating ice and debris and to prevent collection of floating ice and debris by the skimmer head.
B.3.4	The body of the Ice Skimmer head must be constructed of a light-weight corrosion resistant material.
B.3.5	The Ice Skimmer head must incorporate floatation elements to allow for operation while free floating. The Ice Skimmer must be capable of operating up to a 70 m hose-length from the deployment vessel. The floatation elements must be designed to minimize the footprint of the skimmer head in the water.
B.3.6	The Ice Skimmer head must be capable of maintaining buoyancy should any or all floatation element(s) be breached.
B.3.7	The Ice Skimmer head must incorporate a pump that: <ul style="list-style-type: none"> a) Has steam and hot water injection capabilities at discharge of the pump; b) Can pump oil and bitumen of at least 540,000 cSt a distance of 70 metres (m) at 70% of the Ice Skimmer's rated oil recovery capacity; and c) Does not create an oil-water emulsion during pumping.
B.3.8	The Ice Skimmer head recovery efficiency must be at least 90% when operating at full capacity for each of the following oil types: <ul style="list-style-type: none"> a) Light oil, such as diesel or jet fuel; b) Medium oil, such as lube or fresh crude oil; and c) Heavy oil such as bunker C and bitumen.
B.3.9	All oil recovery performance data must be collected in accordance with the general procedure defined in ASTM F631-15, Standard Guide for Collecting Skimming Performance Data in Controlled Environments; or the test protocol defined in ASTM F2709-15, Standard Test Method for Determining a Measured Nameplate Recovery Rate of Stationary Oil Skimmers.
B.3.10	All oil recovery performance data must be collected or verified by one of the following entities: <ul style="list-style-type: none"> a) A classification society, such as Det Norske, Veritas, American Bureau Standards, Bureau Veritas, or Lloyd's Register; b) An independent laboratory; or c) An independent test facility, such as Ohmsett.
B.3.11	Should any boom connector be incorporated into the Ice Skimmer Package design, it must be capable of interfacing with the containment boom connector defined in ASTM F962-04 (2010), Standard Specification for Oil Spill Response Boom Connection: Z-Connector. The following exceptions apply to this Standard: <ul style="list-style-type: none"> a) Toggle pin holes must be located 4.5 inches above and below the design waterline (DWL); and b) The toggle pin hole diameter must be 13/32 inches.

TECHNICAL STATEMENT OF REQUIREMENTS
ICE SKIMMER PACKAGE REQUIREMENTS

B.4 Hydraulic Power Unit

B.4.1	The Ice Skimmer Package hydraulic power unit must be designed to connect to and provide the hydraulic needs of all the components of the Ice Skimmer Package.
B.4.2	The hydraulic power unit must be sized to provide all the required hydraulic pressure and volume without being at its maximum output.
B.4.3	The power supply of the hydraulic power unit must be diesel and must satisfy the Tier 4 emission standards referenced in SOR/2005-32, Off-Road Compression-Ignition Engine Emission Regulations.

B.5 Hose Assemblies

B.5.1	All hydraulic hose assemblies required to operate all the components of the Ice Skimmer Package must be included in the package. Hoses must be at least 70 m in length as per B.3.5.
B.5.2	All oil transfer hose assemblies required for the operation of the Ice Skimmer Package must be included in the package. Hoses must be at least 70 m in length as per B.3.5.
B.5.3	The minimum rated pressure of all fitted, flexible hose assemblies must exceed the working pressure that they may be subjected to while in service. All hose assemblies must be static pressure tested at 1.5 times their rated working pressure for a minimum of 1 hour to confirm no leakage.
B.5.4	All hose assemblies that connect to the Ice Skimmer head must be integrated together into a sealed umbilical hose.
B.5.5	The umbilical hose must be self-floating and capable of maintaining buoyancy during skimmer head deployment, including when the oil transfer hoses are full.
B.5.6	Hoses of at least 10 m in length must be provided for all connections between the HPU, the steam generator, the hose reel and the umbilical to allow for positioning of the units on a ship deck.

B.6 Accessory Units

B.6.1	One hydraulically powered reel must be supplied to hold, deploy and recover the umbilical hose during operation and storage. The reel must allow for the skimmer to operate and collect oil while the hose is still on the reel.
B.6.2	The hydraulically powered reel must be on a slue (or swivel) gear to allow reel to turn for alignment of the umbilical hose during deployment and recovery operations.
B.6.3	One diesel-powered steam generator must be supplied as part of the Ice Skimmer Package. The steam generator must be sized to produce the amount of steam/hot water required by the Ice Skimmer Package for operation.
B.6.4	The steam generator must be capable of producing steam from both salt water and fresh water during operation.
B.6.5	All hoses, cables and parts necessary to use the hydraulic reel and the steam generator in conjunction with the other components of the Ice Skimmer Package must be supplied.

B.7 Storage Container

B.7.1	All Ice Skimmer Package components must be stored in 10 foot ISO containers that adhere to the dimensions of a 1D container as specified in ISO 668 : Series 1 freight containers – Classification, dimensions and ratings. Should the Ice Skimmer components not fit in one 10 foot ISO container, then multiple 10' ISO containers must be provided to hold all the components.
B.7.2	The open top ISO containers must follow the requirements defined in ISO 1496-1 : Series 1 freight containers - Specification and testing – Part 1: General cargo containers for general purposes.
B.7.3	All provided ISO containers must be supplied with a completely removable hard top that can be locked into the container. The removable top must have evenly spaced, non-protruding lifting point, to allow for removal by crane.

B.8 Hoisting Slings and Hardware

B.8.1	The hoisting slings must be provided with all the necessary hardware and components required to lift a full Ice Skimmer Package storage container with the use of an overhead crane.
B.8.2	The hoisting slings and provided hardware must be capable of lifting an Ice Skimmer Package container when full.
B.8.3	Each supplied sling must be permanently marked with the following: <ul style="list-style-type: none"> a) a unique identifier; b) the WLL; c) the sling length d) the sling material; e) the manufacturer; f) the date of manufacture

TECHNICAL STATEMENT OF REQUIREMENTS
ICE SKIMMER PACKAGE REQUIREMENTS

FABRICATION REQUIREMENTS

The Ice Skimmer Package must meet the following fabrication requirements:

C.1	The Ice Skimmer Package must be constructed and finished with a high degree of workmanship, where surfaces are free from blemishes, burrs, defects, irregularities, sharp edges, and other conditions that would be deleterious to the finished component.
C.2	Parts must be properly aligned to preclude any binding and deformation as a result of assembly or operation.
C.3	All equipment subject to freezing temperatures must be kept drained, except during testing and commissioning.
C.4	All parts and equipment must be kept clean and protected against dust, moisture, rapid temperature changes, and foreign matter during manufacture, storage, pre-installation staging, assembly, installation, and post installation.
C.5	All materials used in fabrication must be new, unused and free from defects and imperfection that might affect the serviceability of the finished product; resist corrosion and wear under the environmental conditions specified; and sized or selected to satisfy all the performance requirements specified.
C.6	All synthetic polymers subjected to sunlight must be treated to protect against ultraviolet (UV) degradation, embrittlement, and mold.
C.7	All elastomeric materials in unassembled components and assemblies must contain at least 90% of the initial storage period (as recommended in ISO 2230:2002, Rubber Products – Guidelines for Storage) at the date of delivery to Canada.
C.8	Direct contact between dissimilar metals expected to cause galvanic corrosion must be avoided. If such contact cannot be avoided, an insulating material must be installed between the dissimilar metals to minimize the corrosive effect. The Contractor may propose alternate methods to minimize galvanic corrosion for consideration by Canada.