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See herein

**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

<b>Title - Sujet</b> EREP: Ice Skimmer Package PEIE: Ensemble récupérateur résistant à la glace	
<b>Solicitation No. - N° de l'invitation</b> F7047-190147/A	<b>Amendment No. - N° modif.</b> 001
<b>Client Reference No. - N° de référence du client</b> F7047-190147	<b>Date</b> 2021-01-20
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$ERD-005-28045	
<b>File No. - N° de dossier</b> 005erd.F7047-190147	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> Eastern Standard Time EST <b>on - le 2021-02-16</b> Heure Normale de l'Est HNE	
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Richards, Shazia	<b>Buyer Id - Id de l'acheteur</b> 005erd
<b>Telephone No. - N° de téléphone</b> (343) 553-2046 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

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### Amendment 001

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 1 :

**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 minimize the footprint of the skimmer head in the water.*

TSOR B.3.5 The requirement mentions that the skimmer must be able to operate up to 70m away from the vessel. How does CCG intend to get the skimmer 70m away from the deployment vessel, and then back again? Should the skimmer head be self-propelled with built in thrusters?

**Answer 1:** Once deployed into the water with the use of an onboard crane, the skimmer would be maneuvered into position by smaller assisting vessels. Built-in thrusters would be acceptable and even preferable, but are not mandatory as per the TSOR.

**No changes to the TSOR**

**Question 2:**

**TSOR A.8:** *The Ice Skimmer must be deployable and retrievable from a ship deck or dock with a freeboard of up to 5 m.*

**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 minimize the footprint of the skimmer head in the water.*

**TSOR 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.*

**TSOR 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.*

TSOR B5.1 The requirement indicates that the hoses must be at least 70m long, and references B3.5. However, in A.8 it indicates that the skimmer must be deployable from a ship deck or dock with a freeboard of up to 5m. Therefore, in order to operate 70m away from the deployment vessel, and up 5m, the minimum hose length would be 75m. In addition, the ancillary equipment, such as the Hydraulic Power Unit are unlikely to be mounted at the very edge of the vessel, deck, but rather at a safe distance from the edge, which should be determined by CCG. Please clarify the specific length of hose required, and if the length is actually 70m, please update B3.5 to reflect the reduced operating distance from the vessel.

**Answer 2:** The length of the hoses must be at least 70 m in length. Hoses for ancillary equipment should be 10 m longer to allow for the ancillary equipment to be positioned on deck.

**TSOR Amendment:**

**MODIFY TSOR requirement B.3.5 to read:**

*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.*

**ADD TSOR requirement 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.*

**Question 3:**

**TSOR B.3.7:** *The Ice Skimmer head must incorporate a pump that:*

- a) *Has steam and hot water injection capabilities;*
- 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.*

TSOR 3.7 a) Please clarify if the steam and hot water injection capabilities of the pump shall be at the inlet or discharge of the pump, or both?

**Answer 3:** The steam and hot water injection site must be on discharge side of the pump.

**TSOR Amendment:**

**MODIFY TSOR requirement B.3.7 to read:**

*The Ice Skimmer head must incorporate a pump that:*

- 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.*

**Question 4:**

TSOR 3.7 The requirement does not mention the requirement for Annular Water injection at the discharge of the pump, which is typically a requirement for this type of equipment. Please clarify if this is should be included.

**Answer 4:**

It is up to the bidder to determine what configuration for the pump will best help the pump meet the requirements of the TSOR. If Annular Water Injection is necessary to meet the environmental conditions and viscosity requirements of the TSOR then it should be included in the design.

**No changes to the TSOR**

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**Question 5:**

TSOR B3 The requirement does not mention the requirement that the skimmer head must incorporate steam and hot water injection capabilities. This is typically a basic requirement for any ice capable skimmer system in order to decrease the viscosity of the oil as it comes in contact with the components of the skimmers. Without heat, it is unlikely that any oil or bitumen will reach the pump inlet, where additional heat will be provided. Please clarify if this should be included.

**Answer 5:** The TSOR specifies the environmental conditions that the skimmer must function in and the viscosity of the oil that the skimmer must be able to collect. It is up to the bidder to design their skimmer to meet these requirements. Should steam and injection capabilities for the skimmer head be necessary to achieve the requirements of the TSOR, then yes it should be included in the design.

**No changes to the TSOR**

**Question 6:**

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

TSOR 5.4 & 5.5 The requirement calls for all hose assemblies to be bundled together in an umbilical hose. This can be accomplished in a couple different ways, either as a Floating Hose Set, or a true Umbilical.

1. Floating Hose Set would be to bundle all of the hoses together with some type of floatation units, and to secure them into a sleeve of some sort. The sleeve would be secured closed by either lacing or a zipper or something similar. The ends of the Floating Hose Sets are not sealed, and therefore after encountering oil, the entire hose set would need to be opened up for cleaning/decontamination of all the internal components.
2. Umbilical hoses are manufactured items that include all of the necessary hoses integrated into the floating core, with a high-grade sealed cover, vulcanized ends and steel termination plates for a waterproof seal. These can also be engineered to permit safe lifting of the skimmer head using only the umbilical hose, if desired.

Please clarify CCG's definition of an Umbilical

**Answer 6:** The umbilical hose must contain all the necessary hoses integrated into its core and sealed. The umbilical hose does not need to be designed for safe lifting of the skimmer head.

**TSOR Amendment:**

**MODIFY TSOR requirement B.5.4 to read:**

*All hose assemblies that connect to the Ice Skimmer head must be integrated together into a sealed umbilical hose.*

**Question 7:**

TSOR B6 – The requirement calls for a hydraulically powered reel to hold deploy and recover the umbilical hose during operation and storage. In order to maintain any portion of the umbilical hose on the reel during operation, the reel would need to be manufactured in a way that would allow hydraulic and discharge connections to pass through the drum of the reel. Is this what CCG is requesting? If not, the alternative would be that CCG has to deploy the entire 70m umbilical hose every time that they deploy the skimmer, even when deploying alongside the deployment vessel. This will require significant deck space, as well as manpower of mechanical assistance to move the hose around on the deck. Please clarify what CCG's requirements are.

**Answer 7:** The hydraulic reel must be designed to allow the skimmer head to be fully functional and able to recover oil while any portion of the umbilical hose is still on the reel. For clarification, CCG do not require a reel that can deploy the skimmer head itself; the reel will only serve to hold the umbilical hose.

**TSOR Amendment:**

**MODIFY TSOR requirement B.6.1 to read:**

*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.*

**Question 8:**

TSOR B7 – The requirements and certifications for the storage containers seem to be for freight containers that loaded (on land), transported by intermodal means including on vessels, and then unloaded again at the destination (on land). However, the application for these storage containers will require their use (loading/unloading) while on the deck of a moving vessel at sea, which is a much different application than general purpose freight containers. I believe that it would be more appropriate to classify these as Offshore Containers.

**Answer 8:** The requirements remain as written. CCG requires 10' ISO containers to hold the components of the Ice Skimmer package.

**No changes to the TSOR**

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**Question 9:**

**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.*

TSOR B7.3 – The requirement calls for the ISO containers to be supplied with a removable hard top. Has CCG considered the difficulty and safety concerns of removing and reinstalling a hard top of a container on a moving vessel at sea?

**Answer 9:** The requirement remains as written. For clarification, please note that an ISO container with a removable hard top will only have the roof removable; not the sidewalls.

**No changes to the TSOR**

**Question 10:**

TSOR B8 – Please provide the appropriate standard to which the hoisting slings and hardware shall be designed/certified. If the storage containers are actually deemed to be offshore containers, I believe that they require specific certifications.

**Answer 10:** The requirements remain as written.

**No changes to the TSOR**

## **Annex B**

### Technical Statement of Requirements

#### **Environmental Response Equipment Modernization/Mobile Incident Command Equipment Project**

Ice Skimmer Package

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TECHNICAL STATEMENT OF REQUIREMENTS  
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TECHNICAL STATEMENT OF REQUIREMENTS  
ACRONYMS AND ABBREVIATIONS

## LIST OF ACRONYMS AND ABBREVIATIONS

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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

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TECHNICAL STATEMENT OF REQUIREMENTS  
INTRODUCTION

## SECTION 1 INTRODUCTION

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### 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:

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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:

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

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## SECTION 2 REFERENCE DOCUMENTATION

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### 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
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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.
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## SECTION 3 ICE SKIMMER PACKAGE REQUIREMENTS

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### 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 $\leq 2$ 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.

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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 <sup>3</sup> /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"> <li>a) Has steam and hot water injection capabilities at discharge of the pump;</li> <li>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</li> <li>c) Does not create an oil-water emulsion during pumping.</li> </ul>
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"> <li>a) Light oil, such as diesel or jet fuel;</li> <li>b) Medium oil, such as lube or fresh crude oil; and</li> <li>c) Heavy oil such as bunker C and bitumen.</li> </ul>
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"> <li>a) A classification society, such as Det Norske, Veritas, American Bureau Standards, Bureau Veritas, or Lloyd's Register;</li> <li>b) An independent laboratory; or</li> <li>c) An independent test facility, such as Ohmsett.</li> </ul>
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"> <li>a) Toggle pin holes must be located 4.5 inches above and below the design waterline (DWL); and</li> <li>b) The toggle pin hole diameter must be 13/32 inches.</li> </ul>

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 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 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 storage 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"> <li>a) a unique identifier;</li> <li>b) the WLL;</li> <li>c) the sling length</li> <li>d) the sling material;</li> <li>e) the manufacturer;</li> <li>f) the date of manufacture</li> </ul>

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.