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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: Oil Recovery Vacuum System PEIE: Systèmes à vide portatifs	
Solicitation No. - N° de l'invitation F7047-200141/C	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client F7047-200141	Date 2022-02-21
GETS Reference No. - N° de référence de SEAG PW-\$ERD-005-28504	
File No. - N° de dossier 005erd.F7047-200141	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 2022-03-14 Heure Normale du l'Est HNE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input 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

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
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

Amendment 002

This amendment is raised to modify the Statement of Work (SOW) with the following changes below – *please see attached SOW document.*

Delete: SOW dated 1/27/2022

Insert: SOW dated 02/21/2022

1) SR-25 modified

Delete: SR-25: The Vacuum System must include a solution which vents all toxic vacuum exhaust vapours to an area that is a safe distance from personnel operating the vacuum system.

Insert: SR-25: The Vacuum System must include a solution that vents all vacuum exhaust vapours to an area located at least of 50 ft away from personnel operating the Vacuum System.

2) SR-79 added

Insert: SR-79: The Vacuum System must comply with Transportation of Dangerous Goods Regulations (SOR/2001-286) for transportation of Class 3, Flammable Liquids by road vehicle, railway vehicle, and vessel (i.e. ship).

3) Section 2.1. amended

Insert: 8)Transportation of Dangerous Goods Regulations (SOR/2001-286)

4) Offloading methods - changed from Pressure offload to gravity offload

Delete: SR-42: The vacuum system must pressure discharge from its collection tank to external storage located at least 50 feet away.

Delete: SR-43: The vacuum system must pressure discharge from its collection tank to external storage located at least 100 feet away.

Insert: SR-80: The Vacuum System must gravity offload recovered liquid petroleum products via a discharge port that interfaces to a 6 inch inner diameter discharge hose with female camlock

All other terms and conditions remain unchanged

IAW A-A-59326D "Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specifications For"

Insert:

At the list of acronyms, abbreviations and definitions:

Gravity offload: A method to offload recovered products using gravity and without any mechanical assistance.

5) New requirement for certification for recovery of flammable liquids

Insert: SR-81: The Vacuum System must be certified for recovery of all liquids included in the table below:

#	Product	Flash Point °C	Autoignition °C
1	Kerosene	37.8	210
2	Jet A & Jet A-1	37.8	210
3	Fuel Oil #6	65.6	
4	Fuel Oil #5	68.9	
5	Fuel Oil #4	61.1	262
6	Fuel Oil #2	52.2	256
7	Fuel Oil #1	37.8	210
8	Diesel	37.8	210
9	Hydraulic Oils	>200	
10	Lube Oil (SAE10W30)	136	
11	Canola Oil	326	

Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada.

6) S-46

Delete: SR-46: The Vacuum System suction hose connections must be camlock with one male end and one female end in accordance with A-A-59326 "Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type". The camlock material must be Class 4 as defined within this standard.

Insert: SR-46: The Vacuum System suction hose connections must be camlock with one male end and one female end in accordance with A-A-59326D "Commercial Item Description Coupling

All other terms and conditions remain unchanged

Halves, Quick-Disconnect, Cam-Locking Type General Specifications For". The camlock material must be Class SS4 as defined within this standard.

Section 2.1. amended

Delete: 7) A-A-59326, "Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type"

Insert: 7) A-A-59326D, "Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specifications For"

All other terms and conditions remain unchanged

Statement of Work (SOW)

Environmental Response Equipment Modernization/Mobile Incident Command Equipment Project

Oil Recovery Vacuum System, Medium / Large

February 21st, 2022

STATEMENT OF WORK (SOW)
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LIST OF ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

The following acronyms apply to this Statement of Work:

CCG	Canadian Coast Guard
EREM/MICE	Environmental Response Equipment Modernization/Mobile Incident Command Equipment
OEM	Original Equipment Manufacturer
RSPTL	Recommended Spare Parts and Tools List
US GPM	US liquid gallons per minute
SOW	Statement of Work

The following definitions apply to this Statement of Work:

Term	Definition
Desirable	This term is used to indicate that the requirement is desirable (but not mandatory).
External storage	Storage that is not part of the Vacuum System and not in scope for this procurement.
Gravity offload	A method to offload recovered products using gravity and without any mechanical assistance.
Mandatory	This term is used to indicate that the requirement is mandatory.
Saltwater	Seas, oceans, or other bodies of water typically containing 35 grams per litre of dissolved salts.
Trailer mounted	The equipment will be transported and operated on a suitable trailer.
Vessel mounted	The equipment will be transported and operated on a suitable boat or ship.

SECTION 1 INTRODUCTION

1.1. BACKGROUND

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

1.2. PURPOSE

The CCG requires Portable Vacuum Systems, known as Vacuum Systems hereafter, capable of suctioning light to heavy fuel oils and small solids. There are 2 configurations of the Vacuum System that are defined by the requirements in Section 5: System Requirements. The Vacuum System will be used:

- as a trailer mounted unit for petroleum cleanup operations; and
- as a vessel mounted unit for petroleum cleanup operations in unsheltered waters.

The systems must be designed and fabricated to withstand forces that will be encountered operating on vessels in Beaufort Force 4 sea conditions.

1.3. SCOPE

Any requirement, specification, or other indication in this SOW regarding the work required in the provision of the Vacuum System also pertains to each individual component thereof whether they are purchased together as a complete kit, as individual items, or in any other combination.

SECTION 2 REFERENCE DOCUMENTATION

2.1. APPLICABLE STANDARDS AND SPECIFICATIONS

To the extent specified herein, the following standards and specifications apply to the Vacuum System:

- 1) Off-Road Compression-Ignition Engine Emission Regulations, SOR/2005-32
- 2) ISO 7010, Graphical symbols – Safety colours and safety signs – Registered safety signs.
- 3) ISO 3864-1:2011, Safety Colors and Safety Signs
- 4) Canada Occupational Health and Safety Regulations – Levels of Sound, Part VII - IPG-074
- 5) Canada Occupational Health and Safety Regulations (SOR/86-304), Part V - Boilers and Pressure Vessels.
- 6) Spark Arrester Guide — Multiposition Small Engine (MSE) Volume 2
- 7) A-A-59326D, “Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specifications For
- 8) Transportation of Dangerous Goods Regulations (SOR/2001-286)

2.2. REFERENCE DOCUMENTATION VERSION

Unless otherwise specified by Canada, reference documents specified in Section 2.1 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 SOW and the documents referenced herein, the following order of precedence will be followed:

- 1) Canadian regulations;
- 2) This SOW; and
- 3) Industry and other applicable standards and specifications.

SECTION 3 CONTRACT MANAGEMENT

3.1. MEETINGS/VERIFICATION EVENTS

The Contractor must remotely convene and chair any meetings using Microsoft Teams. If Microsoft Teams is not available to the Contractor, Canada will provide a teleconference line.

Unless otherwise specified by Canada, all verification activities must be conducted at the Contractor's designated facility in the presence of a representative of Canada. If the presence of a representative of Canada is not possible (for example, in the case of departmental travel restrictions or the COVID-19 pandemic), the Contractor must make arrangements to accommodate Canada to witness all verification activities, subject to Canada's acceptance of proposed accommodations. Examples of accommodations include livestreaming or providing recordings of testing activities.

The Contractor is required to provide a Meeting Agenda at least 2 business days prior to each meeting and Record of Decisions not later than 2 business days after each meeting.

Item No.	Meeting/Verification Activities	Date of Meeting	Description	Meeting Deliverables
M-1	Contract Kick-off Meeting	No later than 14 calendar days after Contract Award	A meeting to: <ul style="list-style-type: none"> Discuss in detail all sections of the Contract to ensure that all parties have a mutual understanding of the work required; Review S-1 Project Schedule First Submission; and Review P-1 Product Design Package First Submission. 	<ul style="list-style-type: none"> Meeting Agenda Record of Decisions (RoD) S-1 Project Schedule P-1 Product Design Package
M-2	Ad-hoc Meetings	As required	Meetings scheduled as required to resolve any issues that may arise, and as required for verification testing.	<ul style="list-style-type: none"> Meeting Agenda Record of Decisions (RoD)
M-3	Requirement Verification Activities (first unit of both configurations) identified in P-2.	As per S-1	Perform all required verification activities identified in the Requirements Verification Plan (P-2) on the first complete vacuum system for both configurations (medium and large), demonstrating to Canada that the first unit for each configuration meets all of	<ul style="list-style-type: none"> Testing agenda P-2 Requirement Verification Plan P-3 Requirements Verification Report to be provided following verification activities

			the technical requirements as defined in the SOW.	
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3.2. PROBLEM REPORTING

The Contractor must notify Canada immediately in writing upon identifying an issue that may impact the Work. Canada will advise whether an ad hoc meeting or any other action is required.

3.3. DELIVERY INSTRUCTIONS

The Vacuum System must be delivered complete in all respects in accordance with SOW Section 5 and ready to be deployed.

The Contractor must deliver the goods by appointment only. The Contractor or its carrier must arrange delivery appointments five (5) business days in advance by contacting the designated contact person. The Contractor or its carrier must follow any applicable health protocols during delivery (e.g. facemask covering, social distancing where possible, etc.). The consignee may refuse shipments when prior arrangements have not been made. Deliveries will not be accepted on weekends or statutory holidays.

SECTION 4

DATA DELIVERABLES

4.1.

PROJECT MANAGEMENT DELIVERABLES

The Contractor must submit to Canada for approval the deliverables listed in the table below. The deliverables must be submitted no later than the Date of Submission listed.

Item No.	Deliverable	Schedule for Deliverables	Canada's Approval Requirements	Description
S-1	Project Schedule	<div>First Submission 2 business days prior to meeting M-1 (ref. SOW 3.1).</div> <div>Subsequent Revisions 5 business days after receiving comments from Canada, and as requested by Canada.</div>	Approval required.	<div>Planned/forecasted timeline on which the Contractor will execute the Project (i.e., the Work) updated to reflect the most current dates. At a minimum, the Project Schedule S-1 must include:</div> <div><ul style="list-style-type: none">MeetingsManufacturing milestonesRequirement verification activities for both configurations (medium and large)Quality assurance inspections for each unitDeliverable submission datesShipments/Deliveries</div>

4.2.

PRODUCT DELIVERABLES

Item No.	Deliverable	Schedule for Deliverables	Approval Requirements	Description
P-1	Product Design Package	<p><u>First Submission</u> 2 business days prior to Meeting M-1 (ref. SOW 3.1).</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p>	<p>Approval required prior to commencing manufacturing.</p> <p>Any manufacturing carried out prior to approval is at the Contractor's sole risk.</p>	<p>The Product Design Package must include enough detail to verify that all requirements in the SOW are met. If the product is found to not meet one or more requirements, it must be modified to meet the requirement(s) and re-submitted for approval.</p> <p>As a minimum the Product Design Package must include:</p> <ol style="list-style-type: none"> 1) General arrangement drawings of all Vacuum System components; and 2) System specifications
P-2	<p>Requirements Verification Plan</p> <p><u>First unit of the medium and large configurations only</u></p>	<p><u>First Submission</u> 20 business days after Contract Award.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p>	<p>Canada's approval of P-2 required prior to commencing M-3.</p>	<p>The purpose of the Requirements Verification Plan is to provide complete details of how the contractor will prove that its product design meets all of the requirements in the SOW. The Requirements Verification Plan defines all verification activities required prior to final design acceptance.</p> <p>Requirements must be verified using the method indicated in the "Verification Method" column of Section 5: System Requirements. The verification methods are defined in Table 1. Verification Method detailed Descriptions. If a verification method is not specified in the SOW, the Contractor in consultation with Canada must select an appropriate verification method from Table 1. Verification Method detailed Descriptions.</p>

P-3	<p>Requirements Verification Report</p> <p><u>First unit of the medium and large configurations only</u></p>	<p><u>First Submission</u> 10 business days after completion of verification activities.</p> <p><u>Subsequent Revisions</u> As required.</p>	<p>Any manufacturing of units beyond the First Unit prior to Canada's approval of P-3 is at the Contractor's sole risk.</p>	<p>The purpose of the Requirements Verification Report is to document the results of verification activities conducted in accordance with the Requirements Verification Plan, in order to prove that the Product Design has been verified to satisfy all Technical Requirements (i.e. The report must include documented objective evidence that the design satisfies each and every Technical Requirement). The report must be certified by the Contractor as an accurate record of the product verification results.</p> <p>The Requirements Verification Report must include:</p> <ol style="list-style-type: none"> Results of the each verification activity cross-referenced to the requirement(s) that were verified. The verification method used for each verification activity, and a record of any special equipment, conditions, and procedures. All supporting information including photographs, video, analysis, certifications, OEM specifications, and any other relevant information necessary to prove the design satisfies the requirement. A non-conformance report that identifies all requirements that did not pass initial verification including all associated corrective actions, design changes, and subsequent verification results. <p>Prior to the initiation of mass production, the Contractor must:</p> <ol style="list-style-type: none"> Perform all required verification activities identified in the Requirements Verification Plan (P-2) on the first complete vacuum system for both configurations (medium and large), demonstrating to Canada that the first unit for each configuration meets all of the technical requirements as defined in the SOW (as per M-3); Submit a Requirements Verification Report (per P-3); and
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P-4	Operation and Maintenance Manual	<p><u>First Submission</u> At least 20 business days in advance of first shipment.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p> <p><u>Hard copy</u> 1 English and 1 Canadian French copy to be provided with each system.</p> <p><u>Electronic copy</u> English and Canadian French PDF versions are also required.</p>	Canada's Approval Required prior to shipping.	<p>c. Obtain Canada's formal acceptance of the design represented by the first complete unit for both configurations and Requirements Verification Report.</p> <p>d. Revise the Product Design Package (P-1) to reflect the accepted design represented by the first complete unit.</p> <p>A user manual that includes all necessary information required to safely operate and maintain the Vacuum System. The manual must reference the make and model of equipment provided within the Vacuum System. Existing operations and maintenance manuals may be submitted for Canada's approval.</p> <p>At a minimum, the following information must be included:</p> <ol style="list-style-type: none"> 1. System description and overview 2. System Specifications 3. Labelled system schematic 4. Operating instructions 5. Preventative maintenance schedule based on time interval with instructions for specific tasks to be completed for each interval 6. Hazards and warnings 7. Troubleshooting guide
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P-5	Original Equipment Manufacturer Manuals	<p><u>First Submission</u> At least 20 business days in advance of first shipment.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p> <p><u>Hard copy</u> 1 English and 1 Canadian French copy (if available) to be provided with each system.</p> <p><u>Electronic copy</u> English and Canadian French PDF versions are also required.</p>	Canada's Approval Required prior to shipping.	<p>Original Equipment Manufacturer (OEM) manuals must be provided for all third-party components, if available. Should an OEM manual not be available, the Contractor must obtain proof and provide it to Canada. Acceptable proof will be a letter from the manufacturer or supplier.</p> <p>At a minimum, OEM manuals must be supplied for:</p> <ol style="list-style-type: none">1. The diesel engine2. The vacuum pump
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P-6	Recommended Spare Parts and Tools List	<p><u>First Submission</u> At least 20 business days in advance of first shipment.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p> <p><u>Electronic copy</u> English and Canadian French PDF versions are also required.</p>	Canada's Approval Required prior to shipping.	<p>The Recommended Spare Parts and Tools List (RSPTL) identifies all items that the Contractor recommends to support the ongoing maintenance (i.e., preventive and corrective) of the physical asset being procured. The RSPTL will be subject to Canada's approval and may require additional information from the Contractor as required.</p>
P-7	Quality Assurance Checklist	<p><u>First Submission</u> At least 14 business days prior to Quality Assurance inspection.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p>	Canada's approval required prior to completing any Quality Assurance Reports (P-8).	<p>The Quality Assurance Checklist includes inspection conducted after the complete manufacture of each Production Unit and prior to delivery. The final accepted version of the Quality Assurance Checklist must be used as the template for the Quality Assurance Report per P-8.</p> <p>NOTE: Any quality issues noted during production may result in the need to revise the Quality Assurance Checklist.</p>

P-8	Quality Assurance Report	<p><u>First Submission</u> No later than 5 business days after completion of Quality Assurance activities.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p>	<p>Canada's approval required prior to shipping each production unit.</p>	<p>The Quality Assurance Report details the results of the Quality Assurance Checklist inspection (as per P-7) and demonstrates to Canada that each production unit meets the accepted final design and is fully operational and ready for deployment. The Quality Assurance Report must be certified by the Contractor as an accurate record of the inspection results. The template accepted per P-7 must be used.</p> <p>Prior to shipping a production unit, the Contractor must:</p> <ol style="list-style-type: none">Perform a quality assurance inspection using the Quality Assurance Checklist (P-7) on the complete vacuum system;Submit a Quality Assurance Report (per P8) for the unit; andObtain Canada's formal acceptance of the unit and the Quality Assurance Report. <p>All relevant Certification and Material Data Sheets, or copies thereof, must be appended to each Quality Assurance Report.</p>
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P-9	Master Equipment List	<p><u>First Submission</u> At least 20 business days in advance of first shipment.</p> <p><u>Subsequent Revisions</u> 5 business days after receiving comments from Canada.</p>	Canada's Approval Required prior to shipping.	<p>The Master Equipment List is a listing of equipment, and associated data that will be entered into CCG's Maintenance Management System for the purpose of managing maintenance and tracking.</p> <p>At a minimum, the following information must be included for each major component of the Vacuum Systems (to be specified by the Technical Authority):</p> <ul style="list-style-type: none"> a. Item Name: (E.g. Inverter Gas Generator 3000W) b. Item Description: Characteristics that describe the equipment such as physical and functional specifications, capacity and/or rating (E.g. 13 Km/L) c. Original Equipment Manufacturer (OEM) name and address d. Original Equipment Manufacturer (OEM) part number e. NATO stock number (if applicable) f. Original Equipment Manufacturer (OEM) model name or number: Please specify if this does not match the information provided in "d" from this section g. Supplier catalog number (if applicable) h. Supplier name and address i. Warranty information (i.e., coverage after acceptance by Canada, as per Article XX General Conditions 2030) j. Supply type; please indicate if the equipment is commercially available or custom fabricated k. Product link to website (if available): Link to manufacturer product description
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P-10	Naval Architect Certification Report	<u>First Submission</u> 10 business days after completion of verification activities. <u>Subsequent Revisions</u> As required.	Any manufacturing of units beyond the First Unit prior to Canada's approval of P-10 is at the Contractor's sole risk.	<p>The purpose of the Naval Architect Certification Report is to receive confirmation from a Professional Engineer licenced to practice Engineering in Canada in the field of Naval Architecture that the Vacuum System meets requirement SR - 78.</p> <p>The Naval Architect Certification Report must:</p> <ol style="list-style-type: none">1. Confirm that the 10 ft Vacuum System meets requirement SR - 78.2. Confirm that the 20 ft Vacuum System meets requirement SR - 78.3. Be stamped and certified by a Professional Engineer licenced to practice Engineering in Canada in the field of Naval Architecture.
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Table 1. Verification Method Detailed Descriptions

Verification Method	Description
Analysis	Use of mathematical modeling and analytical techniques to predict the compliance of a design to its requirements based on calculated data or data derived from lower system structure end product validations. This could also include a review of OEM product specifications, certifications, and engineering affidavits for comparison to the requirements.
Demonstration	Showing that the use of an end product achieves the individual specified requirement. It is generally a basic confirmation of performance capability, differentiated from testing by the lack of detailed data gathering. Demonstrations can involve the use of physical models or mock-ups. A demonstration could also be the actual operation of the end product by qualified personnel, who perform a one-time event that demonstrates a capability or function.
Inspection	The visual examination of a realized end product. Inspection is generally used to verify physical design features or specific manufacturer identification. The inspection must confirm that the design satisfies the requirement (product specification and drawing review) and the product matches the design spec (physical examination). For example, if

	there is a requirement that the system does not exceed a specified dimensional footprint, the design review confirms the design footprint meets the requirement and the visual examination of the product confirms it was manufactured in accordance with the design dimension.
Test	The use of a realized end product to obtain detailed data to verify or validate performance or to provide sufficient information to verify or validate performance through further analysis.

SECTION 5 SYSTEM REQUIREMENTS

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 1	5.1. SCOPE			
SR - 62	Two (2) configurations of the Vacuum System are required: 1. The 10 ft. Vacuum System; and 2. The 20 ft. Vacuum System The name "Vacuum System" is used in this document to represent both systems. The columns titled "10 ft Vacuum System" and "20 ft Vacuum System" indicate which requirements apply to each system and whether they are mandatory requirements or desirable requirements.			N/A
SR - 27	The Vacuum System will be used as a trailer mounted unit for petroleum cleanup operations.	Mandatory	Mandatory	N/A
SR - 28	The Vacuum System will be used as a vessel mounted unit for petroleum cleanup operations in unsheltered waters.	Mandatory	Mandatory	N/A
SR - 37	The Vacuum System will be used to recover petroleum products including solid debris up to 2 inches in diameter.	Mandatory	Mandatory	N/A
SR - 2	5.2. REQUIREMENTS			
SR - 50	5.2.1. Service Life			
SR - 34	The Vacuum System must have a service life of at least 15 years when used in operating conditions specified in this document.	Mandatory	Mandatory	Analysis
SR - 4	5.2.2. Operating Conditions			
SR - 26	The Vacuum System must function in air temperatures from -20 degrees Celsius to +40 degrees Celsius.	Mandatory	Mandatory	Analysis

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 47	The Vacuum System must be made with corrosion-resistant materials to withstand marine environments including ocean-spray and Saltwater.	Mandatory	Mandatory	Analysis
SR - 78	The Vacuum System must be certified for use on a sea vessel operating in Type III Open Waters as defined in ASTM F625 / F625-94, Standard Practice for Classifying Water Bodies for Spill Control Systems. Type III-Open Waters are equivalent to wave heights =2 m or Beaufort Force 4 sea conditions.	Mandatory	Mandatory	Deliverable P-10
SR - 3	Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada in the field of Naval Architecture.			
	5.2.3. Functional			
SR - 29	The Vacuum System must maintain a relative vacuum pressure of at least -24 inches Hg while operating in continuous duty at standard atmospheric pressure (29.92 inches Hg).	Mandatory	Mandatory	Test
SR - 30	The Vacuum System must recover liquid petroleum products at a rate of 150 US GPM while operating with a vertical suction lift of 20 feet and a hose length of 50 feet.	Mandatory		Test
SR - 31	The Vacuum System must recover liquid petroleum products at a rate of 150 US GPM while operating with a vertical suction lift of 20 feet and a hose length of 200 feet.		Mandatory	Test
SR - 66	The Vacuum System must recover solids up to 2 inches in diameter.	Mandatory	Mandatory	Analysis
SR - 80	The Vacuum System must gravity offload recovered liquid petroleum products via a discharge port that interfaces to a 6 inch inner diameter discharge hose with female camlock IAW A-A-59326D "Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specifications For"	Mandatory	Mandatory	Demonstration
SR - 41	The Vacuum System suction hose must be hand operated by a single person.	Mandatory	Mandatory	Demonstration
SR - 42	REMOVED	Mandatory		Demonstration

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 43	REMOVED		Mandatory	Demonstration
SR - 70	The Vacuum System must shut down automatically when the storage tank is full.	Mandatory	Mandatory	Analysis
SR - 58	The Vacuum System must shut down automatically when engine oil pressure is too low.	Mandatory	Mandatory	Analysis
SR - 59	The Vacuum System must shut down automatically when engine temperature is too high.	Mandatory	Mandatory	Analysis
SR - 5	5.2.4. Design Constraints			
SR - 48	The Vacuum System must be powered by a diesel engine that is compliant with Tier 4 emission standards as described in SOR/2005-32, Off Road Compression Ignition Engine Emission Regulations.	Mandatory	Mandatory	Analysis
SR - 32	The Vacuum System must include 50 feet of 3 inch inner diameter suction hose divided into 25 feet increments.	Mandatory		Inspection
SR - 33	The Vacuum System must include 50 feet of 4 inch inner diameter suction hose divided into 25 feet increments.	Mandatory		Inspection
SR - 35	The Vacuum System must include 100 feet of 3 inch inner diameter suction hose divided into 25 feet increments.		Mandatory	Inspection
SR - 36	The Vacuum System must include 200 feet of 4 in inner diameter suction hose divided into 25 feet increments.		Mandatory	Inspection
SR - 74	All suction hose provided with the system must include certification documents indicating pressure and conductivity.	Mandatory	Mandatory	Inspection
SR - 72	The Vacuum System must include the following intake ports on the collection tank: - one (1) 3 inch port to interface with 3 inch inner diameter suction hose - one (1) 4 inch port to interface with 4 inch inner diameter suction hose	Mandatory		Inspection
SR - 73	The Vacuum System must include the following intake ports on the collection tank: - one (1) 3 inch port to interface with 3 inch inner diameter suction hose - one (1) 4 inch port to interface with 4 inch inner diameter suction hose - one (1) 6 inch port to interface with 6 inch inner diameter suction hose		Mandatory	Inspection

STATEMENT OF WORK (SOW)
System Requirements

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 44	The Vacuum System suction hoses must be constructed of conductive material or be thick-walled hoses with imbedded conductive wiring to prevent accumulation of static electricity. This conductive hose shall provide suitable electrical resistivity less than or equal to 1 megaohm (1 x 10 ⁶ Ω) per 100 feet.	Mandatory	Mandatory	Test
SR - 45	The Vacuum System suction hoses must not be constructed as thin walled, metallic spiral-wound conductive hoses due to the potential for electrical discharge through the thin plastic that covers the metal spiral.	Mandatory	Mandatory	Inspection
SR - 46	The Vacuum System suction hose connections must be camlock with one male end and one female end in accordance with A-A-59326D “Commercial Item Description Coupling Halves, Quick-Disconnect, Cam-Locking Type General Specifications For”. The camlock material must be Class SS as defined within this standard.	Mandatory	Mandatory	Inspection
SR - 38	The Vacuum System must include a galvanized or stainless steel collection tank with a capacity to store at least 500 US liquid gallons. NOTE: Baffles may be required in the collection tank to counteract free surface effect during operation onboard vessels. This will be based on the P-10 Naval Architect Certification Report.	Mandatory		Analysis
SR - 39	The Vacuum System must include a galvanized or stainless steel collection tank with a capacity to store at least 1000 US liquid gallons. NOTE: Baffles may be required in the collection tank to counteract free surface effect during operation onboard vessels. This will be based on the P-10 Naval Architect Certification Report.		Mandatory	Analysis

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 40	<p>The Vacuum System should include a galvanized or stainless steel collection tank with a capacity to store at least 2000 US liquid gallons.</p> <p>The largest size tank that will fit on an ISO Type C (20 ft) ISO platform container is desired.</p> <p>NOTE: Baffles may be required in the collection tank to counteract free surface effect during operation onboard vessels. This will be based on the P-10 Naval Architect Certification Report.</p>		Desirable	Analysis
SR - 65	The Vacuum System collection tank must include an access hatch with a minimum pass through clearance of 500 mm diameter for inspection and cleaning.	Mandatory	Mandatory	Inspection
SR - 77	<p>The Vacuum System must not include any direct contact between dissimilar metals that would result in galvanic corrosion.</p> <p>Note: Any components in the Vacuum System that rely on a galvanic cell to function correctly (e.g. batteries) are exempt from this requirement.</p>	Mandatory	Mandatory	Analysis
SR - 63	The Vacuum System design should maximize common components used for the 10ft Vacuum System configuration and 20 ft Vacuum System configuration.	Desirable	Desirable	Analysis
SR - 49	The Vacuum System must include a securely fastened waterproof document holder to store all the operations and maintenance manuals defined in SOW P-4 and SOW P-5.	Mandatory	Mandatory	Inspection
SR - 6	5.2.5. Safety			

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method																																																
SR - 81	The Vacuum System must be certified for recovery of all liquids included in the table below: <table><tr><th>#</th><th>Product</th><th>Flash Point °C</th><th>Autoignition °C</th></tr><tr><td>1</td><td>Kerosene</td><td>37.8</td><td>210</td></tr><tr><td>2</td><td>Jet A & Jet A-1</td><td>37.8</td><td>210</td></tr><tr><td>3</td><td>Fuel Oil #6</td><td>65.6</td><td></td></tr><tr><td>4</td><td>Fuel Oil #5</td><td>68.9</td><td></td></tr><tr><td>5</td><td>Fuel Oil #4</td><td>61.1</td><td>262</td></tr><tr><td>6</td><td>Fuel Oil #2</td><td>52.2</td><td>256</td></tr><tr><td>7</td><td>Fuel Oil #1</td><td>37.8</td><td>210</td></tr><tr><td>8</td><td>Diesel</td><td>37.8</td><td>210</td></tr><tr><td>9</td><td>Hydraulic Oils</td><td>>200</td><td></td></tr><tr><td>10</td><td>Lube Oil (SAE10W30)</td><td>136</td><td></td></tr><tr><td>11</td><td>Canola Oil</td><td>326</td><td></td></tr></table>	#	Product	Flash Point °C	Autoignition °C	1	Kerosene	37.8	210	2	Jet A & Jet A-1	37.8	210	3	Fuel Oil #6	65.6		4	Fuel Oil #5	68.9		5	Fuel Oil #4	61.1	262	6	Fuel Oil #2	52.2	256	7	Fuel Oil #1	37.8	210	8	Diesel	37.8	210	9	Hydraulic Oils	>200		10	Lube Oil (SAE10W30)	136		11	Canola Oil	326		Mandatory	Mandatory	Analysis
		#	Product	Flash Point °C	Autoignition °C																																															
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Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada.																																																				
SR - 19	The Vacuum System must include a bonding system ensuring that during operation all connected parts of the system form a continuous conductive path at an equivalent electrical potential.	Mandatory	Mandatory	Test																																																
SR - 20	The Vacuum System must include a grounding system which ensures that while operating from the outdoor ground surface, the bonded system is grounded to earth (i.e. grounding rod or alternative ground connection must be provided with the system). The grounding system must provide an electrical contact resistance of less than 10 ohms between the bonded system and the ground.	Mandatory	Mandatory	Test																																																
SR - 67	The Vacuum System must include a grounding system which ensures that while operating from a trailer deck, the bonded system is grounded to earth (i.e. grounding rod or alternative ground connection must be provided with the system). The grounding system must provide an electrical contact resistance of less than 10 ohms between the bonded system and the ground.	Mandatory	Mandatory	Test																																																

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 21	The Vacuum System must include a grounding system which ensures that while operating from a vessel deck, the bonded system is grounded to the vessel (i.e. alternative grounding method must be provided with the system). The grounding system must provide an electrical contact resistance of less than 10 ohms between the bonded system and the ground.	Mandatory	Mandatory	Test
SR - 22	The Vacuum System must include a spark-arresting exhaust system that is listed as a qualified spark arrester within the Spark Arrester Guide — Multiposition Small Engine (MSE) Volume 2. Note: A searchable database can be found at the following web link: https://www.fs.fed.us/t-d/programs/fire/spark/otc_sch.php	Mandatory	Mandatory	Inspection
SR - 23	The Vacuum System must include a red emergency stop button at each operator control position that when pressed, instantly stops all moving parts and powers off all mechanical and electrical systems.	Mandatory	Mandatory	Demonstration
SR - 24	The Vacuum System must include a solution to prevent combustible vacuum exhaust vapors from contacting a potential source of ignition within the system.	Mandatory	Mandatory	Analysis
SR - 25	The Vacuum System must include a solution that vents all vacuum exhaust vapours to an area located at least 50 ft away from personnel operating the vacuum system.	Mandatory	Mandatory	Analysis
SR - 60	The Vacuum System diesel engine must be equipped with an automatic positive air shutoff mechanism that closes the air intake to prevent over-revving and explosions.	Mandatory	Mandatory	Analysis
SR - 75	The Vacuum System collection tank must comply with all requirements in Canada Occupational Health and Safety Regulations (SOR/86-304), Part V - Boilers and Pressure Vessels.	Mandatory	Mandatory	Analysis
SR - 7	5.2.6. Transportability			

STATEMENT OF WORK (SOW)
System Requirements

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 79	The Vacuum System must comply with Transportation of Dangerous Goods Regulations (SOR/2001-286) for transportation of Class 3, Flammable Liquids by road vehicle, railway vehicle, and vessel (i.e. ship).	Mandatory	Mandatory	Inspection
SR - 51	The Vacuum System must be mounted on a skid with a base dimensionally identical to a Type 1D (10 ft) freight container base defined by ISO 668, Series 1 Freight Containers - Classification, Dimensions, and Ratings.	Mandatory		Analysis
SR - 52	The Vacuum System must be mounted on a skid with a base dimensionally identical to a Type 1C (20 ft) freight container base defined by ISO 668, Series 1 Freight Containers - Classification, Dimensions, and Ratings.		Mandatory	Analysis
SR - 68	The Vacuum System skid bottom corner fittings must be positioned IAW ISO 668, Series 1 Freight Containers - Classification, Dimensions, and Ratings.	Mandatory	Mandatory	Inspection
SR - 57	The Vacuum System skid bottom corner fittings must conform to ISO 1161, Series 1 freight containers - Corner and intermediate fittings - specifications.	Mandatory	Mandatory	Test
SR - 61	The Vacuum System must not exceed a height of 2.5 metres.	Mandatory	Mandatory	Inspection
SR - 53	The Vacuum System must include forklift pockets certified to lift the Vacuum System when the collection tank is empty. Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada.	Mandatory	Mandatory	Analysis
SR - 54	The Vacuum System must include forklift pockets certified to lift the Vacuum System when the collection tank is full. Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada.	Mandatory	Mandatory	Analysis

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 55	The Vacuum System must include lifting points certified for overhead lifting when the collection tank is empty.	Mandatory	Mandatory	Analysis
SR - 56	Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada. The Vacuum System must include lifting points certified for overhead lifting when the collection tank is full.	Mandatory	Mandatory	Analysis
SR - 8	Certification must be provided by a Professional Engineer licenced to practice Engineering in Canada.			
	5.2.7. Label Plates and Product Identifiers			
SR - 9	The Vacuum System label plates must be as permanent as the normal life expectancy specified for the items to which they are affixed.	Mandatory	Mandatory	Analysis
SR - 10	The Vacuum System label plates must withstand the environmental conditions and cleaning procedures expected for the items to which they are affixed.	Mandatory	Mandatory	Analysis
SR - 11	The Vacuum System label plates must be written in both Canadian English and French.	Mandatory	Mandatory	Inspection
SR - 12	The Vacuum System must include label plates identifying 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.	Mandatory	Mandatory	Inspection
SR - 13	The Vacuum System must include all safety and hazardous warning label plates in accordance with ISO 3864 -1:2011, Safety Colors and Safety Signs.	Mandatory	Mandatory	Inspection
SR - 14	The Vacuum System must have a noise warning label plate if the Vacuum Pump sound pressure level is greater than 87 dBA, in accordance with Canada Occupational Health and Safety Regulations – Levels of Sound, Part VII - IPG-074.	Mandatory	Mandatory	Inspection

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 15	The Vacuum System must include label plates to identify each control, switch, gauge, and display.	Mandatory	Mandatory	Inspection
SR - 69	The Vacuum System must include label plates to indicate safe working limits, maximum capacities, and masses, as applicable, of equipment.	Mandatory	Mandatory	Inspection
SR - 16	The Vacuum System must include Product Identifiers assigned to each item on the Master Equipment List.	Mandatory	Mandatory	Inspection
SR - 17	The Vacuum System Product Identifiers must be marked on a label plate in a visible location on the equipment.	Mandatory	Mandatory	Inspection

ID	Requirement	10 ft Vacuum System	20 ft Vacuum System	Verification Method
SR - 18	<p>The Vacuum System Product Identifiers must:</p> <ul style="list-style-type: none"> a) Use alphanumeric characters to indicate the name of the manufacturer, date of manufacture, and manufacturer serial number; b) Contain no spaces between the individual elements that compose the identifier; and c) Adhere to the following convention: <ul style="list-style-type: none"> i. Use four uppercase letters that best represent the name of the manufacturer as the first element of the product identifier. Canada reserves the right to review, and accept or reject the first element proposed by the Contractor for self-identification. ii. Use eight numeric digits that correspond to the following format for the second element of the product identifier: DDMMYYYY (where DD represents the two-digit day, MM represents the two-digit month, and YYYY represents the four-digit year). iii. Use the full, alphanumeric serial number assigned by the manufacturer for the last element of the product identifier. <p>An alternate product identification mark using serial numbers and other identifying information may be proposed by the Contractor for consideration.</p>	Mandatory	Mandatory	Inspection

APPENDIX A: WELDING REQUIREMENTS

Structure, piping, components and items requiring welding must be produced following weld design requirements issued by the design engineer. The design engineer must define the type and size of welds. All fillet welds must be double continuous and all butt joints must be complete joint penetration unless otherwise accepted by the CG TA.

Companies performing welding must be certified by the CWB to CSA Standard W47.1-2019 Division 1 or 2.

Welding must be performed by qualified welders following approved welding specifications, procedures and techniques; specifically CSA Standards W47.1-2019 and CSA Standard W59-2018 for structure and ASME BPV Section IX – 2021 and ASME BPV B31.3 – 2020 for pressure piping, pressure vessels and pressure containment systems.

Welders must be qualified to CSA Standard W47.1- 2019 for welding structures and ASME BPVC Section IX – 2021 for welding pressure piping, pressure vessels and pressure containment systems.

Workmanship and completed welds in structures must meet the acceptance criterion of CSA W59-2018 for statically loaded structures and ASME BPVC B31.3 – 2020 for pressure piping, pressure vessels and pressure containment systems.

All welds must be visually examined for acceptance by a Visual Welding Inspector; that is employed by a third party Weld Inspection Organization certified by the CWB to CSA Standard W178.1- 2018 and is certified by the CWB to CSA Standard W178.2 - 2018 Level 2 or 3.

All welds in components subjected to pressure or vacuum must be pressure and vacuum leak tested under witness of a qualified third party mechanical engineer to the safety factor parameters defined by the design engineer.

Visual weld inspection and pressure and vacuum leak test reports must be provided for review and acceptance by the CG TA upon request.