Request for Proposals
(RFP)

Alternative Subsea Protection Strategies for Ice Scour Regions - Phase I

April 30, 2014
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1 Definitions and Project Introduction

1.1 Definitions

For the purposes of this RFP, the following definitions are provided:

“Addendum” means the document issued by Petroleum Research to all Service Providers during the open period of the RFP, containing additional information or corrections, made by Petroleum Research, to the RFP already issued.

"Budget" shall mean the budget for the Project as set forth in the Proposal.

“Contract” means the legal written agreement to be negotiated and entered into between the Service Provider and Petroleum Research to provide the research and development services and deliverables as stated in the Scope of Work under any specified negotiated conditions.

“Deliverable(s)” mean the deliverables as described in Section 4.1 of this RFP.

“JIP” means a Joint Industry Project.

“May” shall indicate something that is not mandatory but permissible.

“Project” means Alternative Subsea Protection Strategies for Ice Scour Regions, as more particularly described in the Scope of Work.

“Proposal(s)” means the document(s) submitted by the Service Providers in response to the RFP.

“Request for Proposal (RFP)” means the documents issued to the Service Providers by Petroleum Research in connection with the preparation of the Proposal, including all Addendums.

“Scope of Work (SOW)” means a formal written description that captures and defines the work activities, deliverables and timeline a Service Provider will execute against in performance of the specified work for Petroleum Research, as more particularly described in Section 3 of this RFP.

“Service Provider(s)” means any person(s), corporation(s), partnership(s), joint venture(s), company(s) or other organization(s) which may submit a Proposal to Petroleum Research in response to the RFP.

“Shall/Must” shall indicate a mandatory requirement. Failure to meet a mandatory requirement may result in the rejection of a Proposal.

“Should” shall indicate something that is recommended but not mandatory. If the Service Provider fails to provide recommended information, Petroleum Research may, at its sole option, ask the Service Provider to provide the information or evaluate the Proposal without the information.

“Steering Committee (SC)” means a committee composed of representatives as identified to the Service Provider by Petroleum Research to address project execution and governance decisions.

“Successful Service Provider” means the Service Provider whose Proposal has been accepted by Petroleum Research and with whom Contract negotiations will be undertaken.
1.2 Introduction and Background

Petroleum Research Newfoundland & Labrador (Petroleum Research) is a federally-incorporated, not-for-profit corporation that identifies opportunities, develops proposals, funds, and manages the execution of research and technology development projects on behalf of the Newfoundland and Labrador offshore oil and gas industry. Research and technology development projects funded must be strategically and commercially relevant, create value for members, be compliant with Canada-Newfoundland and Labrador Offshore Petroleum Board ("C-NLOPB") research and development ("R&D") guidelines, enhance local R&D capacity and capability in strategic research areas and enable broader application of technologies developed through Petroleum Research.

It is required that all work and expenditures will take place in Newfoundland and Labrador. The Successful Service Provider (and any consultant(s)/sub-contractor(s)/vendor(s) where used) will be required to have a base of operations in Newfoundland and Labrador from which the Scope of Work (SOW) will be executed and where the Contract will be administered.

Significant investments have been made by the oil and gas industry in recent decades to understand and mitigate the risk to subsea infrastructure from contact by scouring ice features, typically icebergs with a draft exceeding local water depth. To design a subsea system capable of operating safely in an ice-prone region a variety of environmental inputs, the risk of contact, and the inherent strength and reliability of the subsea infrastructure must be analyzed in an integrated approach to meet an overall system target level of safety.

The current approach employed on Jeanne d’Arc basin developments on the Grand Banks of Newfoundland has been to avoid contact by placing wellhead and associated equipment in excavated drill centres (EDC’s) such that the top of any critical equipment is placed at sufficient depth below the surrounding mudline to reduce the risk from scouring iceberg contact. EDC’s represent a significant development challenge to small subsea developments due to their economic and technical challenges.

A number of research and development projects have been funded by Petroleum Research members and others to investigate alternatives to EDC’s, such as the Subsea Ice Risk Assessment and Mitigation joint industry project (SIRAM)\(^1\). Alternate strategies that have been explored in this and other projects include sacrificial Xmas trees, seabed-mounted protection structures, and sub-mudline protection structures (i.e. caissons). This project will investigate and advance the most promising of these concepts (and others, if identified) and will build on results of other projects that have been executed to date.

1.3 Objective of the Request for Proposal

Petroleum Research, by means of this RFP, is seeking Proposals from qualified Service Providers to form the basis for the negotiation of a Contract to conduct project work as detailed in the SOW. The overall objective of this project is to investigate and advance selected strategies to reduce the cost of protecting subsea assets installed in regions prone to ice scour without increasing the risk of hydrocarbon release from ice impact. As outlined in detail in Section 3.1 for Phase I of this project, Petroleum Research is seeking the services of a senior technical resource with at least 15 years of subsea development experience in harsh, ice-prone regions to execute this project. This project will involve the following activities:

\(^1\) Brown, M., Bruce, J., Piercey, G, Phillips, R. and King, T., (2012). SIRAM and PIRAM – Application for Canadian Offshore Developments, Arctic Technology Conference, Houston, TX, OTC 23786
• Complete a review of all potential concepts and strategies (those which have been identified and any new strategies which may exist) for further development; and,
• Select most promising concepts, document R&D gaps for those concepts and develop a plan to close those gaps.

2 Administrative

2.1 Technical and Contractual Contact

Any questions regarding this RFP should be submitted by e-mail to the contact stated below with the project name written in the email subject line.

Petroleum Research Contact:

<table>
<thead>
<tr>
<th>Name</th>
<th>Susan Hunt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>(709) 738-7904</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:susan.hunt@petroleumresearch.ca">susan.hunt@petroleumresearch.ca</a></td>
</tr>
</tbody>
</table>

2.2 General Instruction for Preparing Proposal

Service Provider shall prepare and submit the Proposal according to the instructions of this RFP. Service Provider shall not be reimbursed for any costs, expenses or charges which the Service Provider incurs or is required to expend in its preparation of a Proposal, including travel and attendance at any clarification or pre-award meetings. Petroleum Research shall not be under any liability whatsoever for or in respect of payment of any said costs, expenses or charges.

This Request for Proposals is not a tender call. The lowest cost Proposal will not necessarily be accepted. Petroleum Research reserves the right to accept the Proposal which it deems most advantageous to accomplish the SOW, and also reserves the right to reject any or all Proposals, in each case without notice, and to not complete the Project.

Petroleum Research reserves the right, at its sole discretion, to negotiate with any Service Provider it believes has the most advantageous Proposal or with any other Service Provider or Service Providers concurrently. In no event will Petroleum Research be required to offer any modified terms to any Service Provider prior to entering into a Contract with the Successful Service Provider. Notwithstanding the evaluation contained herein, Petroleum Research reserves the right to evaluate Proposals, negotiate the Contract and/or to execute the Project, in whatever fashion is, at Petroleum Research’s sole discretion, most advantageous to Petroleum Research.
2.3 Proposal Requirements

2.3.1 Location and Regulatory Requirements
- The work must be compliant with C-NLOPB R&D guidelines; and,
- The Service Provider must carry out all work in Newfoundland and Labrador.

2.3.2 Proposal Submission Requirements
The Proposal must demonstrate how the Service Provider will fulfill the SOW and meet all proposal requirements as described herein. Petroleum Research will evaluate the Proposal based on the guidance provided in Section 5, herein. The Proposal shall include:

- The official registered name and contact information (title, telephone number, fax numbers and e-mail address) of the Service Provider and other parties who will be involved in the Project;
- A listing of all key project team personnel, including a description of the roles and responsibilities of each team member, demonstrating their ability to complete the project;
- Detailed Curriculum Vitae and other supporting documents that demonstrate that identified resources possess the required expertise and experience (see Section 3.1);
- An Executive Summary presenting a high-level synopsis of the Service Provider’s response to the RFP. The summary should be a brief overview of the proposal and should identify the main features and benefits of the proposed efforts to be undertaken;
- A Preliminary Project Execution Plan, including:
  - Description of the technical approach that will be taken to complete the SOW;
  - A description of the project management approach; including any third party subcontractors that may be used, the specific tasks for which they will be responsible and a description of how the Project will proceed from beginning to end;
  - A Project Schedule showing the duration of major tasks, timing of milestones and completion date of project deliverables;
  - A Project Budget that provides a detailed breakdown of all estimated costs for the work proposed and an overall project cost. The Project Budget breakdown shall:
    - Be in Canadian dollars;
    - Include all costs associated with project management, administration, professional services, personnel, materials, travel, incidental costs and contingency costs; and,
    - Identify hours worked and cost per hour for all resources, including contractors, subcontractors or technical experts; and,
- Listing and description of the identified assumptions, risks and constraints of the project.
2.4 Submission Instruction and Deadline

The Proposal should be signed on the Service Provider’s behalf by a duly authorized signing officer of the Service Provider and submitted in a manner consistent with the requirements of this RFP. One (1) electronic copy of the Proposal should be submitted as a single package by email in PDF format and received by Petroleum Research on or before the closing date; Friday, May 30\textsuperscript{th}, 2014, 3:00 PM (Newfoundland Time).

Proposals are to be identified in the subject line as follows:

<table>
<thead>
<tr>
<th>Identification</th>
<th>Alternative Subsea Protection Strategies for Ice Scour Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td><a href="mailto:susan.hunt@petroleumresearch.ca">susan.hunt@petroleumresearch.ca</a></td>
</tr>
</tbody>
</table>

2.5 Discrepancies, Omissions or Clarifications

The Service Provider is required to study the RFP and to obtain all information they may require to enable submission of the Proposal. In responding to the RFP, the Service Provider shall be deemed to have satisfied itself as to the correctness and sufficiency of its Proposal as submitted. No Proposal shall be conditional upon the availability of labor, staff, equipment, materials, permits, authorizations or anything whatsoever which the Service Provider is required to provide.

Should Service Provider find discrepancies in or omissions from the RFP, or have any doubts as to the meaning or intent of any part thereof, Service Provider shall notify Petroleum Research by e-mail to the contact as specified in Section 2.1, herein. Questions and comments that are deemed to materially affect the RFP SOW, timeline, etc. or that may be of interest to all prospective Service Providers will be handled as an Addendum while the RFP is open and will be made available to all Service Providers on Petroleum Research’s website and by email to the same persons as who were emailed the initial RFP information if the RFP was initially disseminated by email.

2.6 Rejection of Proposal

Any Proposal or part thereof which is incomplete, conditional or obscure, contains additions not called for, contains irregularities of any kind or does not fulfill the mandatory requirements listed in this RFP or does not offer sufficient information and opportunities to complete the SOW may be rejected by Petroleum Research in its sole discretion.

2.7 Preparation and Submission of Proposal

Two or more Service Providers may choose to work cooperatively to address the needs of this RFP. Service Provider team arrangements may be desirable to enable the parties involved to complement each other’s capabilities and expertise, while offering the best combination of performance, cost and deliverables to be provided under the RFP. Petroleum Research will recognize the integrity and validity of Service Provider team arrangements provided that:

- The arrangements are identified and relationships are fully disclosed; and,
- A prime Service Provider is designated that will be fully responsible for all Contract performance and requirements.
2.8 **Contract**

Any Contract resulting from this RFP shall be governed by the laws of the Province of Newfoundland and Labrador and shall be issued in the legal entity name of the Successful Service Provider(s) exactly as that Service Provider’s legal name is stated in the response document.

Any provision in the Proposal may be included in the Contract as a direct provision thereof. Petroleum Research has no liability unless and until a Contract is negotiated and signed. Petroleum Research does not guarantee or warrant that it and the Successful Service Provider will successfully negotiate and execute a Contract. Petroleum Research will not be responsible for any of the Successful Service Provider’s legal costs associated with Contract development, negotiation or execution.

The Contract will provide for the following minimum terms and condition:

- Petroleum Research’s standard payment terms which are net 30 days from receipt of the invoice. All applicable taxes must be shown separately on all invoices. All invoices will be subject to a 10% holdback which will be released upon satisfactory completion of the Deliverables;
- The Contract shall be reimbursement based and all progress payments requested by the Successful Service Provider must be supported by sufficient detail regarding the work completed, resources used, costs incurred, and hours worked and must be approved by Petroleum Research before payment;
- Throughout the Project period the Successful Service Provider will be accountable to Petroleum Research for all deliverables;
- It will be the responsibility of the Successful Service Provider to sub-contract all consultant(s) that will be used for the duration of the project;
- The Successful Service Provider and consultant(s) may be expected to meet periodically with Petroleum Research and the SC to review the Project progress; and,
- No payment will be made for the cost of work incurred to remedy errors or omissions for which the Successful Service Provider is responsible.

In the event of a decision by Petroleum Research to terminate the Project at any point after entering into a Contract with the Successful Service Provider, liability to the Successful Service Provider will extend only to those costs actually and properly incurred up to the time of such termination.

2.8.1 **Additional Future Work**

Petroleum Research may amend or replace any Contract that may emerge from this RFP to complete future work related to this Project. Petroleum Research may also issue a subsequent Expression of Interest (EOI) and/or RFP to address any future work related to this Project or subject matter area, without awarding such work to the Successful Service Provider. The decision to amend or replace an existing Contract and/or to issue a subsequent EOI and/or RFP is at the sole discretion of Petroleum Research.
3 Scope of Work

3.1 Scope of Work Description

Significant investments have been made by the oil and gas industry in recent decades to understand and mitigate the risk to subsea infrastructure from contact by scouring ice features, typically icebergs with a draft exceeding local water depth. To design a subsea system capable of operating safely in an ice-prone region a variety of environmental inputs, the risk of contact, and the inherent strength and reliability of the subsea infrastructure must be analyzed in an integrated approach to meet an overall system target level of safety.

The current approach employed on Jeanne d’Arc basin developments on the Grand Banks of Newfoundland has been to avoid contact by placing wellhead and associated equipment in excavated drill centres (EDC’s) such that the top of any critical equipment is placed at sufficient depth below the surrounding mudline to reduce the risk from scouring iceberg contact. EDC’s represent a significant development challenge to small subsea developments due to their economic and technical challenges.

A number of research and development projects have been funded by Petroleum Research members and others to investigate alternatives to EDC’s, most notably the Subsea Ice Risk Assessment and Mitigation joint industry project (SIRAM). Alternate strategies that have been explored in this and other projects include sacrificial Xmas trees, seabed-mounted protection structures, and sub-mudline protection structures (i.e. caissons).

Phase I of this project consists of the following activities:

- Develop Project Management Plan, including project assumptions and dependencies, project risks, project constraints, execution plan and success criteria;
- Review Research & Development from SIRAM and other completed or ongoing projects, input from technology suppliers, service companies and user (Industry sponsor consultations), etc., to assess alternative protection concepts for further advancement;
- Develop technical basis to support comparison of concepts.
- Undertake screening level assessment and make recommendation on concept(s) to take forward to the next Phase;
- Develop detailed project plan for the next phase, including scope of work, execution plan, timelines and cost estimate.

The project is expected to take no more than four months of person effort to complete. A senior technical resource with subsea development experience in harsh, ice-prone regions is required to execute this project. This resource will ideally have subsea development management experience and new technology development experience. Specific qualifications include:

- At least 15 years of experience in the subsea engineering industry;
- Experience developing field architecture in ice-prone environments, including tie-back and greenfield development concepts & methodologies;
- Experience on study projects, concept reviews, and pre-FEED engineering;
- Experience managing studies and research & development projects;
- Cost estimating and schedule development experience;
- A degree or equivalent in a relevant engineering discipline. A professional engineering designation is preferred; and,
- Knowledge of marine construction methods and subsea installation methodologies.

4 Deliverables and Reporting

4.1 Project Deliverables

Subject to revalidation and changes as research & development gaps are identified, overall project deliverables are anticipated to be:

(I) Project Management Plan for Phase 1:
   - Project assumptions and dependencies, project risks, project constraints, execution plan and success criteria for Phase 1;

(II) Subsea Protection Strategies Concept Assessment report, documenting potential benefits of identified concepts based on previous work and current consultations;

(III) Detailed project plan for Phase 2 project(s); and,

(IV) Final report documenting steps taken and results obtained in Phase 1.

4.2 Meetings

Regular meetings will be scheduled between the Successful Service Provider and Petroleum Research and/or the Steering Committee. These meetings will cover progress completed, discuss future work, evaluate project outcomes and update on any risks to Project schedule or Project Budget. The frequency of these meetings will be determined by Petroleum Research.

5 Proposal Selection

Petroleum Research may consider the following criteria in the selection of the Successful Service Provider:

- The approach that will be used to conduct the work;
- Project management experience and technical knowledge and experience of the proposed investigators, consultants and/or others assigned to the project;
- The number of person hours required to complete the work, the allocation of hours among tasks and the overall time to complete the work;
- The reasonableness and accuracy of the estimated costs to conduct the proposed project and the effort applied by the Service Provider relative to the time and resources used;
- Contribution to the development of Newfoundland and Labrador research and development capacity; and,
- Such other matters as Petroleum Research considers appropriate in respect of the Scope of Work.
6 **Project Timeline**

The following is the estimated timeline for the project procurement process:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission deadline</td>
<td>3:00 PM NST, Friday, May 30\textsuperscript{th}, 2014</td>
</tr>
<tr>
<td>Project start</td>
<td>July, 2014</td>
</tr>
</tbody>
</table>

7 **No Liability**

No claim whatsoever shall be entertained arising out of a Service Provider’s failure to study the RFP or to submit the required information as stated in Section 2.3.

Service Provider shall not hold Petroleum Research or any of its officers, employees, assigns, independent contractors, subcontractors, agents or representatives liable for any error or omission in any part of this RFP. While considerable effort has been made to ensure that all information contained in the RFP is accurate, Petroleum Research does not represent or warrant that the information contained in this RFP or any supplemental documents is accurate, comprehensive or exhaustive. Nothing contained in this RFP is intended to relieve the Service Provider from forming its own opinions and conclusions with respect to the matters addressed in this RFP.

Petroleum Research and any of its officers, employees, assigns, independent contractors, subcontractors, agents or representatives shall not be liable to the Service Provider or any of its officers, employees, assigns, independent contractors, subcontractors, agents or representatives for any losses (including damage for loss of anticipated profit), expenses, costs, claims, damages, including incidental, indirect, special or consequential damages, or liabilities arising out of or by reason of or attributable to this RFP or arising out of, submitting a Proposal, requesting clarification, the communication of any information contained in the Proposal to any party, or due to Petroleum Research’s selection or non-selection of any Proposal received, or as a result of the termination of this RFP or the cancellation of the Project.