E&P SOUND & MARINE LIFE PROGRAMME

Joint Industry Programme on E&P Sound and Marine Life - Phase III

Request for Proposals Number: JIP III-21-001

Field Work Low Visibility Detection Techniques

Release Date: 23 July 2021

Introduction

This Request for Proposals (RFP) seeks proposals for independent studies to advance understanding of the potential and the performance of commercial, currently available low-visibility monitoring systems under realistic operational conditions encountered during seismic survey. The aim is a) for these systems to be evaluated via a field trial; and b) framework parameters to assess and compare performance across monitoring platforms to be proposed based on the results of the field data analysis.

The work called for in this RFP is required to meet the information needs of the above JIP, specifically Research Category 4 – Mitigation and Monitoring; see www.soundandmarinelife.org website. In 2015 the JIP commissioned a desktop study "Low Visibility Real-Time Monitoring Techniques Review" which was published in May 2017. This RFP will advance work on the identified key recommendations (related to field experiments) from this desktop study; see *Background* section below.

The proposals being requested must address the Proposal Description, Proposal Features, and Project Deliverables detailed below.

Initially, applicants are kindly requested to submit Pre-Proposals (no more than 4 pages) to the JIP. The non-committing Pre-proposal shall describe the rationale and nature of the work proposed, the approach to addressing questions posed in the RFP, and an estimate on time used and distribution of costs.

Applicants submitting Pre-proposals will be given feedback from the program and will be either encouraged or discouraged from submitting a full proposal.

Organizations submitting (Pre-) Proposals should also adhere to the **Application Procedure** and **Critical Dates** set out below. In addition, the Terms & Conditions referred to in the RFP shall apply.

Application Procedure

To respond to this RFP, please follow the relevant instructions given on the **Funding** page of the JIP website. Proposals should refer to the above RFP number and should be submitted electronically to info@soundandmarinelife.org.

Those organizations submitting Proposals should refer to the **outline contract** on the JIP website. This sets out the terms & conditions under which any contract will be carried out under the management of the International Association of Oil & Gas Producers (IOGP). In particular, attention is drawn to the specific term relating to management of health, safety, security and environment aspects of a contract. All IOGP contracts have such a section, but the specific wording that will appear in this section depends on the type of activity (desk-top study, field work, etc.) to be conducted.

Critical Dates

23 July 2021	**Release of RFP**
17 September 2021	**Deadline for Pre-Proposals to be received at info@soundandmarinelife.org (Midnight GMT, 17 Sept 2021)**
15 October 2021	**Notification of Pre-Proposal applicants selected for Full Proposal submissions, including guidelines for the Full Proposal (*Pre-proposal applicants not selected for full proposal submission will be informed by IOGP*).**

Indicative subsequent time-table (subject to quality & volume of Pre-Proposals received)

** end November 2021	**Deadline for submission of Full Proposals**
** mid-January 2022	**Full proposal applicants notified of possible JIP requests for additional information**
** February 2022	**Notification of award decisions and contract negotiations**
** March 2022	**Anticipated start date for award(s)**

*** Exact dates will be notified by IOGP to short-listed Applicants upon completion of Pre-Proposals evaluation process. IOGP reserves the right to amend or extend the time-table for full Proposals.*

We will confirm receipt of proposals. If you have not received confirmation of receipt of your proposal within 1 week of the above deadline, please contact Wendy Brown at IOGP (Tel +44 (0) 20 3763 9700; e-mail info@soundandmarinelife.org. The review of proposals will aim to conclude within 2 months of the submission deadline, after which applicants will be notified by the JIP.

Background

In many regulatory frameworks the presence of marine mammals has to be monitored during activities offshore such as seismic surveys. If marine mammals are present within a pre-prescribed distance or area around the sound source (commonly called the mitigation or exclusion zone), mitigation actions are set into effect. This concept is based on monitoring the mitigation zone and where possible an extended area around it for the presence of marine mammals. If an animal is detected in the monitoring zone, it may be possible to track its movement to assess the likelihood of it entering mitigation zone in order to maximize the time available for making decisions to implement mitigation actions.

Historically, Marine Mammal Monitoring during seismic surveys has been conducted by human observers scanning the sea surface for the presence of marine mammals (or other endangered species). Visual observations are hence limited by a marine mammal's availability at the sea surface, by visibility and sea state. In recent years, there has been an increased interest in using alternative technologies to address the limitations of visual monitoring. In particular, the use of Passive Acoustic Monitoring (PAM) has increased with some national guidelines encouraging its use and industry efforts focusing on improving existing PAM capabilities. Other monitoring technologies have also been developed and tested to overcome such limitations and provide additional (assistance) tools to generally increase the likelihood of detection.

The SMRUM-OGP2015-002 report on **Low Visibility Real-Time Monitoring Techniques Review** identifies Passive Acoustic Monitoring PAM, thermal infrared (IR), Active Acoustic Monitoring (AAM), and radar as the most widespread supplementary technology technologies. This 2017 report is available on the Sound and Marine life JIP website (link) to help inform the preparation of proposals in response to this RFP,

specifically regarding recommendations related to field experiments to quantify important parameters influencing the detection and false alert rates of the respective technologies.

Organizations responding to this RFP are highly encouraged to review this report. Through this RFP we seek to advance our understanding of the potential and the performance of commercial, currently available low-visibility monitoring systems under realistic operational conditions, i.e. as encountered during seismic surveys. Given the fact that sensors have widely different characteristics with specific advantages and disadvantages depending on the operational constraints of the activity, environmental conditions, and focal species, a study (including the deployment vessel) should be capable of adequately capturing this variability. The performance of currently available low visibility detection systems shall be evaluated via a field trial and necessary parameters for potential frameworks to assess and compare performance across monitoring platforms shall be proposed based on the results of the field data analysis.

Results shall:

a) Inform decisions on which are the best-suited low-visibility detection system(s) for a given environmental and operational setting
b) Determine a gradient of effectiveness under different operating conditions
c) Evaluate a context dependent performance of all the systems
d) Generate usable detection functions for the tested systems.

As a secondary consideration, the JIP is interested in a recommendation about a framework that can be used in the future to develop an open source simulation tool that can be used to assess the efficacy of different low visibility monitoring methods for a wide range of survey scenarios calibrated with the results of the field trials

Description of Proposals Being Requested

Technologies identified as potential monitoring tools for the detection of marine mammals under low visibly conditions are PAM, Active Acoustic Monitoring (AAM), radar and thermal InfraRed (IR). While other technologies exist, such as Light Detection And Ranging (LiDAR), these four technologies are considered to have the highest level of commercial availability. All these technologies have a set of factors influencing their ability to detect (or miss) a marine mammal, but also to provide false detections or misreport the animal's position relative to the mitigation zone, potentially leading to false alerts. The JIP seeks to deepen its understanding of sensor and system performance with regard to which low-visibility monitoring technology or combinations of technologies provides the best results for realistic operational conditions under various environmental conditions. Results in this context should be considered in terms of number of correct detections versus number of false detections, i.e. missed events resulting in non-compliance with mitigation procedures and possibly imposing a risk to marine mammals, and false alerts, resulting in unnecessary and costly interruptions of a seismic survey.

This RFP seeks proposals to conduct focused field trials of a combination of commercially available low-visibility technologies mentioned above.

Applicants are kindly requested initially to submit Pre-proposals (absolute maximum 4 pages) to the JIP. The non-committing pre-proposal shall describe the rationale and nature of the work proposed, the approach to addressing questions posed in the RFP, and an estimate on time used and distribution of costs. Applicants submitting pre-proposals will be given feedback from the program and will be either encouraged or discouraged from submitting a full proposal.

Applicants are asked to consider the following general points in their applications:

- Proposals should demonstrate the applicant's in-depth knowledge of marine mammal monitoring methods and the findings of the SMRUM-OGP2015-002 report on Low Visibility Real-Time Monitoring Techniques Review (link). This 2017 report gives clear guidance on specific needs to answer to this current RFP; JIP expects proposals in response to this call to build on this work rather than to repeat this work;
- Field studies shall employ detection technologies in an operational setting. For PAM or AAM, this implies assuming/simulating/creating an acoustic environment as to be expected from a real seismic survey, including shadow zones and masking from air gun sound sources and background sound levels due to the vessel movement. For visual/optical techniques this implies including confounding factors such as changing observer alertness, typical sea states, glare, visibility etc. If replicating a seismic operating environment is not feasible, an option to estimate performance under conditions representative of seismic operations (i.e. background, seismic survey operation, and sensor flow noise, observation platform height and spatial stability, etc.) should be proposed;
- Field studies shall be carried out assuming the currently best commercially available systems/implementations for each technology in its optimal configuration, e.g. for the technologies for which the system height above the sea level is important the vessel characteristic should be similar to a realistic seismic vessel. We explicitly discourage proposing any activities that may require significant levels of investment by including the aim of advancing emerging technologies as part of this RFP.
- Applicants shall describe clearly how the field trials will be planned, executed and their results will be analysed and reported. Including how Health, Safety and Environment (HSE) aspects of the activity will be managed.
- Results shall be presented in terms of the number of correct and false detections, including cross-correlations (ROC curves) to evaluate which technologies provide complementary information. The methodology for the comparative analysis across the monitoring technologies and the derivation of appropriate detection functions should be explained in detail.
- Evaluation of technologies shall be performed in conjunction and comparison with traditional MMO visual monitoring, which is the standard method used today. This implies that the performance (alertness, accuracy of distance estimates) of traditional MMO work should also be included in the comparison and tested to create a realistic benchmark other low visibility technologies can be evaluated against.

Field Studies

Field studies are the primary objective of this work, deriving their right of existence from information needs identified a-priori in the SMRUM-OGP2015-002 report.

Proposed field work under this RFP will aim at gaining knowledge on sensor performance under realistic operational conditions as occurring during seismic surveys. Particularly, spatially resolved detection rates and rates of type I (false positives) and type II (false negatives) errors shall be determined in the field under realistic conditions.

Applicants are asked to consider the following field-study conditions in their applications:

- The JIP acknowledges that a comprehensive field work, including comparative testing of all detection methodologies in an operational setting on a seismic vessel is demanding and costly, especially when taking into account that commercial seismic surveys are not necessarily in areas where many encounters with focal specimens are to be expected. Hiring a seismic vessel with an active air gun array for an extended period of time to do a dedicated field test is outside the funding scope of the JIP.
- Applicants are encouraged to explore options to 'piggy-back' on other commercial seismic surveys or research cruises with vessels already equipped with the relevant technology for needed field studies. Ideally vessels of opportunity with some of the mitigation methods already

onboard (e.g. MMOs, AAM and/or PAM) would be preferred and the proposal could investigate opportunities to add other techniques being studied;
- The study should NOT be based on artificial/simulated species.
- Field trials should be conducted in an area with a high probability of animal encounter and use a vessel of a reasonable size for the technology being tested.
- Field studies shall fully describe the environmental and operational conditions under which they were performed and care shall be taken to be able to transfer findings to other scenarios (e.g. detection functions will vary with observer/detector height).
- Field studies should be conducted in such a manner as to ensure statistical robustness and mutual independence of the detections by the various low-vis techniques employed.

Evaluating Sensor Performance

Applicants are asked to consider the following points in their presentation of the evaluation of the sensor performance:

- Analysis of model results shall be based a statistical approach to allow for parameter variances to calculate average values, error estimates and sensitivities to parameter settings.
    - Evaluate variance of effectiveness under different operating conditions
    - Evaluate context dependent performance for all the tested methodologies.
- Existing data should be analysed to obtain detection functions, i.e. the probability of detecting a cue as function of relative position (often only distance) between the sensor and the cue.
- Evaluation results should also be used to identify/guide field studies as needed to adequately describe technology efficacy, e.g. direction specific detection functions.

Desirable Features of Proposals

Responses to this RFP should address each of the following (see also **RFP Response Format** page of website):
- A detailed scope of work to prepare and provide the Deliverables detailed below.
- A detailed work plan to show how the terms of the contract will be met.
- Timeframe for completion of project and significant milestone events during the project.
- A detailed cost estimate in US dollars, which includes:
    - Support for travel in order to interface with related company representatives or others with expertise in this subject area;
    - Assumptions to support the cost estimate; and
    - Any contingencies to address unknowns.
- A list of personnel to be involved in the project and their qualifications, and their proposed role in this project.
- Researcher experience in this area and previous work.
- Where appropriate to the project, a discussion on how you manage animal care and use in your proposed work (*see also Application Procedure above*)
- An overall proposal summary (one paragraph).

Project Deliverables

Project deliverables shall include:

a) **Monthly/Quarterly Progress Reports** that summarize the work conducted, tasks planned for the coming period, amount spent (vs. budget), and forecasts a spend plan for the duration of the project. The specific reporting formats will be determined following contract award.

b) **Draft and Final Project Report** to include:
   1. A report detailing overall study, results and recommendations (as outlined in description of proposal)
   2. Recommendations to include a clear framework that can be used in the future to develop an open source simulation tool to help assess the efficacy of different low visibility monitoring methods for a wide range of survey scenarios calibrated with the results of the field trials.

c) **One or more manuscripts** submitted for publication in a peer-reviewed journal.

In addition to preparation of draft and final reports, the selected bidder should take into account (in budgeting and resources planning) the potential for developing a peer-reviewed paper or manuscript (including the cost of open access to a publication), participation at a relevant conference and involvement in the production of a non-technical Fact Sheet for this project.

Terms & Conditions:

By submitting a proposal to JIP, the potential contractor accepts the terms and conditions set out in this RFP. This RFP does not commit the JIP, through IOGP, to contract for any supply or service and the JIP shall not be deemed to have accepted any proposal submitted by any potential contractor unless and until a duly executed written agreement is in place and then only for such scope as specifically identified in the written agreement. The potential contractor acknowledges that IOGP and the JIP participants may accept or reject any proposal for any reason whatsoever. The JIP may decide to fund a study in part or as a whole.

Those responding to this RFP are advised that the JIP will not pay for any costs incurred in preparation of a response to this invitation, including without limitation costs and expenses of attending meetings and worksite visits related to this RFP.

All correspondence and documentation associated with this invitation will be in English. Submissions and information will not be shared with other potential contractors.