## *REQUEST FOR EXPRESSION OF INTEREST (EOI)*

# From SMMEs with the capability to validate, productise, market, and commercialise Vessel Motion Forecast Tools

## *EoI No. BDC/Smart Mobility/*

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| Date of Issue: | 20/10/2025 | |
| Closing Date and Time: | 25/11/2025 | |
| EoI submission: | Only electronic submissions will be accepted | |
| Enquiries | Sipho Dikweni | Email: sdikweni@csir.co.za |
| CSIR business hours | 08:00 – 16:30 | |
| Category | Port Operations and Supply Chain Management | |

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## 1 Introduction

The Council for Scientific and Industrial Research (CSIR) is an entity of the Department of Science, Technology and Innovation in South Africa. The CSIR is one of the leading scientific research and technology development organisations in Africa. As a public institution established under the Scientific Research Council Act, 1988 (Act 46 of 1988 (as amended by Act 71/1990)), the CSIR focuses on multi-disciplinary research, development and innovation (RD&I). It has developed a vessel motion forecast tool that predicts moored ship motions for given ships at certain berth conditions. The prediction is given for the current wave conditions and for any future wave forecast event and provides actionable insights for port operators to optimise berth planning and improve safety. Recent experience has highlighted the fact that the port operators cannot readily assess and quantify the impact of long waves on a particular vessel. So, although the port operators might be aware of a long-wave event on the horizon, they are unable to determine what, if any, effect this will have on port operations. The operators then err on the side of caution and either request operations to cease or request the vessel to depart the port. This might lead to mooring line breaks, port downtime, safety risks and financial losses.

## 2 Purpose

The objective of this invitation process is to find suitable South African small, medium and micro enterprises (SMMEs) to establish a mutually beneficial partnership for the productisation, validation and commercialisation of the vessel motion forecast tool. Such SMMEs will enter into a licence agreement and collaborate with the CSIR to refine, productise, validate and commercialise the technology.

## 3 Background

Long waves (infragravity) present a growing challenge to port operations in South Africa and across the world. These waves, with periods typically ranging from 30 seconds to 5 minutes, resonate with harbour basins and moored vessels, causing significant oscillations that result in vessel instability, excessive mooring line tension and disruptions to cargo handling. South Africa's major ports, which are responsible for over 90% of the country's trade, are particularly vulnerable due to their exposure to high levels of long-wave energy along the coastline. Ports

such as Ngqura and Cape Town have experienced frequent operational delays, cargo handling suspensions and damage to mooring infrastructure triggered by long-wave-induced motion. These disruptions not only reduce berth productivity and throughput but also elevate operational costs and vessel idle time, impacting both shipping companies and exporters. Globally, similar issues have been observed in Spain, Japan and Australia, where long-wave events have caused port closures, broken mooring lines and significant financial losses due to downtime and delayed cargo operations.

The problem is exacerbated by ageing port infrastructure, limited monitoring capacity and the absence of predictive tools that can forecast the onset and severity of long wave events. As a result, port operators often face unexpected operational downtime, congested berths and reduced service reliability, all of which lower the port's performance index and international competitiveness. Structural mitigation options such as modifying breakwaters or upgrading mooring systems are costly and time consuming, while operational responses are often reactive rather than preventative. The lack of integrated, real-time prediction and communication tools prevents effective coordination with shipping lines and exporters, leading to inefficiencies and lost revenue opportunities. Without strategic investments in monitoring, modelling and adaptive management systems, South African ports risk persistent disruptions, mounting maintenance costs and declining resilience in the face of increasing met-ocean variability linked to climate change. These impacts can, however, be reduced with predictive tools determining where, when and what size vessels can be moored safely, and what operability percentages can be achieved during these times. For that, the CSIR has developed the Vessel Motion Forecast Tool to predict the occurrence and impact of long waves and thus improve operational planning, reduce unexpected downtime and provide realistic operational times to shipping companies so they can also plan accordingly. The Vessel Motion Forecast Tool allows port operators to assess the suitability of different sizes of vessels at particular berths based on potential future events. With correct planning, this ensures minimal disruptions during quayside operations as well as vessel safety.

## 4 Vessel Motion Forecast Tool

The Vessel Motion Forecast Tool predicts moored ship motions due to long-period waves for given ships at berth locations inside a port and the expected operability percentages based on guidelines for specific ships. The prediction is given for the current wave condition and for any forecast wave event. The moored vessel motions are determined using detailed numerical wave and moored ship motion modelling. By using the model outputs of ship motions and operability, the port operators can establish if the ship can be safely moored for the current wave conditions or any of the detected wave events in the future. Since each ship size reacts differently for each berth location, the port operators can use the Vessel Motion Forecast Tool to do berth planning in the most efficient way for the expected wave conditions.

## 5 Invitation for the Expressions of Interest

Expressions of interest (EoI) are hereby solicited from relevant entities to form partnership agreements for the productisation and commercialisation of the Vessel Motion Forecast Tool. The ideal partner should have strong software development and integration capabilities and should specifically meet the following requirements:

1. Technical development skills: The partner should have experience in the software development lifecycle to support the integration, customisation, and deployment of the platform in the marketplace.
2. Technical integration skills: The partner must possess the ability to seamlessly integrate the platform with existing systems, ensuring compatibility with various hardware, software and Internet of Things devices used in Port Operations.
3. Customisation and scalability: The partner should demonstrate the capacity to customise the platform to address the unique challenges and environmental conditions of various ports across the world.
4. User-centric design and training: The partner should prioritise user-friendly design to ensure that the platform is accessible to port operators, shipping companies and exporters. Experience in the principles of Information and Communications Technology for Development (ICT4D) is a requirement.
5. Market access and distribution networks: The partner should have established networks and relationships with key stakeholders in the ports, logistics and shipping value chain.

6. Proven track record: The partner should have a demonstrated history of successful project delivery, particularly in developing and deploying new technology solutions.
7. Collaborative mindset: The partner must be willing to work closely with the CSIR, sharing knowledge, resources and expertise to co-develop and refine the platform for maximum impact.
8. Financial stability and resource availability: The partner should have financial stability and resource capacity to invest in the development, deployment and ongoing maintenance of the platform.
9. Commercial capabilities: The partner should demonstrate strong business acumen and the ability to develop and execute a viable commercialisation strategy. This includes identifying revenue streams, pricing models, and marketing strategies to ensure the platform's financial sustainability and widespread adoption. Experience in negotiating partnerships, securing funding, and driving sales in the marine, ports, logistics and shipping sectors.
10. Product design capabilities: The partner should possess expertise in product design, ensuring the tool is intuitive, visually appealing, and functionally effective. This includes the ability to conduct user research, create wireframes and prototypes, and iterate based on feedback to deliver a solution that meets the needs of all stakeholders. A focus on human-centred design principles will be critical to the platform's success.
11. Knowledge of ports, port operations and systems deployed at ports would be advantageous.

Scope of work:

- Seek market opportunities for the deployment of the technology;
- Collaborative efforts will be necessary to integrate and deploy the Vessel Motion Forecast Tool into the end user’s existing workflow, along with any training that might be required for users to start using the tool;
- Market validation, development of a go-to-market strategy and commercialisation of the tool; and
- Business model development, validation and refinement.

## 6 Expressions of Interest submission

All EoI submissions must be submitted using this email address:
vesselmotion@csir.co.za

The CSIR requires that all EoI submissions be submitted electronically using the link above. Should the file size exceed 30 MB, the interested parties can submit EoIs in multiple emails. **Use the EoI number and the description of the EoI as the subject of your email.**

## 7 Expressions of Interest programme

One or more bid windows are envisaged. The current EoI programme incorporates the following key dates:

- Issue of EoI document:
- Closing/submission date: Tuesday, 25 November 2025 at 16:30

## 8 Submission of Expressions of Interest

Interested parties are required to submit a detailed business case, clearly demonstrating a viable plan for commercialising our technology. The business case must include three-year financial projections; a clear revenue model; a technology deployment plan (if any), market analysis (including Segmentation, Targeting and Positioning as well as Total Addressable Market (TAM), Serviceable Available Market (SAM) and Serviceable Obtainable Market (SOM) ; identification of risk areas, along with proposed risk mitigation strategies.

The following documentation must be included:

- Proof of SMME status as per the National Small Enterprise Act (from, e.g., Central Supplier Database (CSD) reports); and
- Company profile with experience in software development and numerical modelling.

The EoI submitted by companies must be signed by a person or persons duly authorised thereto.

## 9 Evaluation process and criteria

All proposals will be evaluated by an evaluation committee against the following criteria:

- Confirmation of SMME status;
- Registration as a South African company;
- Clear business case; and
- Demonstrable ability to carry out the scope of work as outlined in Section 5 of this EoI document.

Short-listed applicants may be required to present to the CSIR and shall be notified thereof no later than seven days prior to the presentation date.

Please note: If you have not heard anything from us within 12 weeks of applying, please consider your application unsuccessful.

## 10 Elimination criteria

EoI submissions will be eliminated under the following conditions:

- Submission after the deadline;
- Submitted to an incorrect address; and
- EoI submissions that do not accompany the mandatory criteria as listed above.

## 11 Deadline for submission

EoI must be submitted via the link provided above, no later than 16:30 on Tuesday, 25 November 2025.

## 12 Cost of submission

Organisations submitting an EoI assume all risks for resource commitment and expenses, direct or indirect, of proposal preparation and participation throughout the EoI process. The CSIR is not responsible directly or indirectly for any costs incurred by the organisation.

## 13 Process for shortlisted applicant/s

- The shortlisted applicant/s shall proceed to the application phase, where a partnership agreement will be signed to indicate the responsibilities of both parties during the productisation phase.

## 14 CSIR reserves the right to:

- Extend the closing date;
- Request documentary evidence regarding any issue;
- Appoint one or more entities, separately or jointly (whether or not they submitted a joint EoI);
- Award this EoI as a whole or in part, or not at all; and
- Cancel or withdraw this EoI as a whole or in part.

## 15 DISCLAIMERS

The CSIR has produced this EoI in good faith. However, the CSIR, its agents and its employees do not warrant its accuracy or completeness. To the extent that the CSIR is permitted by law, the CSIR will not be liable for any claim whatsoever and howsoever arising (including, without limitation, any claim in contract, negligence or otherwise) for any incorrect or misleading information contained in this EoI due to any misinterpretation of this EoI. This EoI is a request for expressions of interest only and is not an offer document; answers to it must not be construed as acceptance of an offer or imply the existence of a Contract between the parties. By submission of its information, organisations shall be deemed to have satisfied themselves with and to have accepted all terms and conditions of this EoI. The CSIR makes no representation, warranty, assurance, guarantee or endorsement to any party concerning the EoI, whether with regard to its accuracy, completeness or otherwise and the CSIR shall have no liability towards any party in connection therewith.