S21AS00165

Funding Opportunity Description

Ocean Energy Safety Institute 2021-2026

BSEE is seeking proposals from qualified organizations or institutions to enter into a cooperative agreement with BSEE for five years. This project will be a collaborative venture with the Recipient, including substantial involvement of the BSEE and the Department of Energy (DOE).

The Ocean Energy Safety Institute (OESI) was originally established through a Cooperative Agreement in 2013 by BSEE in response to a recommendation in 2012 made by the Ocean Energy Safety Advisory Committee (OESC) after the Deepwater Horizon-incident in 2010. DOE was a member of the OESC and chaired the Spill Prevention Subcommittee of the OESC and a party to the OESC recommendations. The current OESI cooperative agreement is reaching its end, and the Parties are now embarking on OESI 2.0. DOE was not involved in the original OESI Cooperative Agreement; however, at BSEE's invitation and DOE's recognition of their capability and responsibility to promote the safe exploration and development of offshore energy, DOE's Office of Oil and Natural Gas and Office Energy Efficiency & Renewable Energy, has agreed to become a "Party" to OESI 2.0.

The OESI reports to the Director of BSEE and is managed by a non-Federal organization that is selected through a competitive process that is repeated every several years. The Institute supports BSEE's missions regarding offshore safety and environmental management through various means, which may include: research and development, including development and maintenance of a technology research and development (R&D) roadmap and dissemination of research results; facilitating communication and collaboration among entities involved in offshore safety and environmental management through workshops or other methods; and other topics as may be identified in the future.

The selected OESI managing organization can establish a board or steering committee consisting of relevant government agencies industry, academia, non-governmental organizations, and other centers of expertise that would help to develop the OESI's goals, strategies, and provide ongoing strategic and technical advice to the Institute.

Throughout the Nation's history ocean energy development has transitioned from shallow water, conventional hydrocarbon reservoirs to more technically challenging deep water, high temperature, high pressure geologic systems in the Gulf of Mexico and other areas such as the Arctic. This has resulted in more complex drilling and production activities which, provides new technological challenges requiring new expertise for the personnel working on offshore facilities.

More recently, the nation has embraced renewable energy opportunities from its offshore provinces. The nation's first offshore wind facility is in operation, and the offshore wind development pipeline in the US includes more than 25 gigawatts--comprising thousands of potential turbines--that could be installed in U.S. waters over the coming decade. Marine and Hydrokinetic (MHK) energy is earlier stage and not yet broadly commercialized, though the

potential for marine energy to power ocean observing and environmental monitoring devices is being explored and is promising. These sources of offshore renewable energy are valuable to the nation's energy security and strengthen the American economy, and safe and environmentally sustainable operations are integral to the development of these technologies.

Up to $40 million will be made available for the operation of the Ocean Energy Safety Institute (OESI) through this cooperative agreement during this 5-year period. BSEE will accept proposals for the operation and maintenance of an institute that will facilitate research and development and other related tasks to support improvements in safety and environmental protection for offshore oil and gas and wind developments. Though MHK technology is not commercialized and developing research and development for the safety of these installations would be premature, MHK is uniquely suited to power the monitoring devices themselves. OESI will be a collaborative initiative involving government, academia and scientific experts. The recipient institution receiving the award will be responsible for managing OESI, providing input on yearly objectives, conducting certain work to further the attainment of those objectives, and being a focal point for collaboration on issues within the OESI mandate. While OESI will operate independently of BSEE and DOE, both agencies will be substantially involved in the institute through a Joint Steering Committee (JSC), which will include representatives from each agency with expertise related to oil and gas, offshore wind and marine and hydrokinetic (MHK) energy technologies. The JSC will provide input to OESI on its technology roadmaps, annual plans, and review and approve its major deliverables.

OESI was originally envisioned as an entity that would facilitate research and development, and implementation of operational improvements in the areas of offshore drilling safety and environmental protection, blowout containment and oil spill prevention and response. Since the original OESI was stood up, we have expanded the scope to include offshore renewable energy development considerations as well and oil and gas production and development considerations. The objective remains the same, however: to improve the safety and environmentally sustainable development and operation of offshore energy through cooperative research, while building a collaborative model grounded upon principals of shared learning and promotion of dialogue. The first iteration of OESI will come to a close in a matter of months, and BSEE is interested in furthering the work of OESI with OESI version 2.0.

Purpose

OESI 2.0 is intended to be a joint collaborative initiative engaging the government, academia, industry, and scientific stakeholder communities. Its objective is to conduct cooperative research while building a collaborative model grounded upon principals of shared learning and promotion of dialogue and complementary research. OESI 2.0's goal is to collaborate with academia, industry, and other non-governmental organizations to drive safety performance, energy production on the Outer Continental Shelf (OCS), and innovative inspection, detection, and environmental monitoring technologies, resulting in a safer workplace, improved environmental stewardship performance, and greater energy security. The purpose of funding this initiative is to establish an institute that would operate independently of the Department of the Interior (DOI) and DOE while also supporting and enhancing both Departmental programs through collaborative research and development to help identify operational improvements in the areas of offshore energy development and monitoring. In close collaboration with the JSC, the selected

host institution will be responsible for managing OESI, providing input on yearly objectives through the development of an annual plan, conducting certain work to further the attainment of those objectives, and being a focal point for collaboration on issues within the OESI mandate.

Objective
Build a World Class Center of Excellence for Ocean Energy Safety and Development that brings together the interests of DOI/BSEE and DOE/Office of Oil and Natural Gas, and DOE/Office of Energy Efficiency and Renewable Energy for mutual benefit.

Key Tasks of the Organization responsible for managing OESI include, but are not limited to:

- Develop and submit draft technology roadmaps for research leading to improved safety and environmental protection for offshore oil and gas, wind, and MHK development and operations. Development activities are expected to include establishing the strategic direction, providing leadership, manage intellectual property and data, etc.;

- Once roadmaps have been approved by the JSC, develop in collaboration with the JSC and submit annual plans for activities pursuant to the approved roadmaps

- Administer a world-class program of research and development (R&D), pursuant to approved roadmaps and annual plans described above, that includes offshore safety, oil and gas production, oil spill prevention and response, and offshore safety and environmental protection research and monitoring approaches related to wind and MHK power as defined below, in accordance with appropriate authorities and in conjunction with relevant federal resource agencies.

    - R&D program administration includes competitive and/or non-competitive solicitations, proposal evaluations, selections and award negotiation, for specific research projects pursuant to approved roadmaps.
    - Administrative Costs: In order to maximize R&D funding, BSEE and DOE expect that less than 10% of the funds will be utilized to manage the OESI.

- Technology transfer of research results and insights to industry and other stakeholders and identification of research needs and gaps and recommending new research topics

- Workforce development associated with the application of innovative and advanced technologies used for offshore oil and gas operations as well as offshore wind and MHK.

- Collect, analyze and disseminate health, safety and environmental compliance data to highlight key issues, identify trends, and elucidate technology gaps

- Identify and develop partners willing to provide non-Federal R&D investments funding and other relationships with the broader research community and stakeholders as necessary to complete and disseminate the research, as well as to prevent duplication of effort with ongoing related research projects

- Specific technical areas of interest include:

    - For oil and gas:

        - Research for offshore oil and gas production and oil spill prevention across all Technology Readiness Levels in the areas of 1) geohazards identification including lower-cost, real-time data capture and processing, and more localized geological characterization related to slumping and earthquake potential, and zones of anomalous hydrostatic pressure; 2) maintaining well control over the life of the well including drilling, completion, production operations, workovers, final plugging and abandonment including wellbore construction (pipe and cement) and wellbore integrity and stability assessments and predictions, early kick detection, high pressure/high temperature materials for zonal isolation, and transmission of data from ahead of the bit to surface; 3) subsea automation and reliability including sensors, subsea power generation, enhanced oil recovery injection systems, drilling from the seafloor, robotics, fiber optics corrosion treatment/prevention, materials for extreme conditions, prevention of cyber failure, reliable flow assurance and control, produced water treatment and handling; and 4) surface systems and umbilicals, including met-ocean effects associated with normal and extreme conditions, predictions of effects on platforms at small scale and cumulative fatigue analysis that inform facilities design and predictive equipment maintenance capabilities over the lifecycle of the facilities comprised of engineered systems extending from the ocean floor to and including the production platform

        - Research for oil and gas production across all Technology Readiness Levels (TRL) with special emphasis on TRL 5 and above in the areas of 1) production operations and facilities; 2) wellbore integrity; and 3) reservoir stimulation technologies including enhanced oil recovery.

        - Manually mine and review safety incident reports created prior to 2019 to identify selected data points to demonstrate skill in data analytics to identify trends.

    - For offshore wind:

- Research and development on technologies to improve installation and O&M safety and widen associated weather windows, especially in high sea state conditions where safe operations are currently not possible, such as operations-focused met-ocean monitoring, modeling and simulation tools, and improved access and transfer methods for technicians, tooling, and supplies
- Research and development on technologies that reduce the need for hazardous operations, such as improved remote monitoring and management of wind plants, and the automation of installation and O&M operations, such as through autonomous (e.g. drone-based) inspection and repair, prognostic health monitoring and management, and technologies to monitor and reduce worker fatigue and strain
- Research and development on technologies to improve environmental protection in offshore wind development and operations, such as through improved construction noise mitigation techniques, and improved marine mammal monitoring technologies
- Research that improves spill (such as of drivetrain and other lubricants, dielectric transformer oils) prevention and management associated with offshore wind operations
- Research to inform domestic workforce development associated with safe offshore wind operations, such as gaps analysis of existing worker safety standards and training, and synthesis of best practices from more mature offshore wind markets.

- For MHK:

    - Research, development, and deployment of MHK-powered environmental monitoring devices, such as MHK recharging stations for autonomous underwater vehicles (AUVs) and/or aerial drones
    - Certification of monitoring devices powered by MHK
    - Gather lessons learned for safe and environmentally sustainable offshore operations for future MHK installations