Peer Review Plan

Date: June 27, 2025

BSEE Funding Source or Author's Division: Office of Offshore Regulatory Programs
Emerging Technologies Branch 45600
Woodland Road
Sterling, VA 20166

Title: Evaluation of Technology Assessment Program (TAP) 787 – RESIN COMPARED TO CEMENT AS A SEALANT FOR OCS WELLS

Subject and Purpose: The subject of this study is to peer review the research report "RESIN COMPARED TO CEMENT AS A SEALANT FOR OCS WELLS." Portland cement is the current well sealant of choice used in industry for permanently sealing a petroleum well when a well has reached the end of its production lifecycle. Yet, this studied aimed to evaluate the performance of various resin-based compounds (epoxy, phenolic, polyester, and furan) as sealants for petroleum wells in the outer continental shelf and compare them to Portland cement.

This study had many objectives it aimed to accomplish. To begin with, the study aimed to evaluate commercially available resin materials and close the gap in fundamental chemical and physical knowledge of the selected resins in their application as well sealants. Through a literature review, lab testing, and finite element analysis, the study aimed to quantify the long-term stability and short-term performance of the selected resins under well conditions. Seal integrity and material performance was to be assessed for the resins and then compared to the Portland cement properties under the same conditions. Based on the resin evaluation, this study aimed to develop operational guidelines for implementing resins in the outer continental shelf. HSE factors as well as the cost-benefit were to be evaluated over the range of applications and conditions. Based on the findings overall, the study aimed to evaluate current regulatory and industry standards and propose example regulation guidelines for implementing resin as a wellbore sealant.

This peer review seeks to validate the research conducted by assessing for reproducibility, transparency, and the communication of error and uncertainty through the involvement of interdisciplinary qualified peer reviewers from a variety of backgrounds who view the recommendations and assumptions with constructive skepticism.

Impact of Dissemination: BSEE considers this research topic to be influential scientific information since it likely has a direct and immediate impact on private sector decisions related to BSEE-regulated decisions. Since the research study developed operational guidelines for resin application in the OCS, including application guidelines around mixing and placement of resin sealant, specific considerations around mixing, managing exothermicity reaction temperature increase, and clean-up/disposal will likely drive changes to industry specifications and best practices around well barrier material selection. Additionally, the results will support BSEE in making permitting decisions around well barrier material selection submissions.

Upon conclusion of the peer review, BSEE will post all documents and data shared with the peer reviewers and/or contracted organization as well as all documents and data generated by the peer reviewers and/or contracted organization, including the peer-review reports and agency comments, if applicable, on BSEE's research records website: https://www.bsee.gov/research-record.

Timing of Review: Estimated to be from October 1, 2025 – September 30, 2025 (Total peer review process of not more than 12 months is desired for this project.)

Manner of Review, Selection of Reviewers, and Nomination Process:

This peer review shall be conducted through the contract BSEE BPA Process. This process will provide for a panel of qualified subject matter experts (SMEs) selected by the agency in order to achieve an optimum level of expertise across the spectrum of issues. The SMEs will be required to maintain both balance and independence while minimizing any potential conflicts of interest. The public will not be consulted in the nomination of potential peer reviewers.

Primary criteria for peer reviewers include the following:

- Mechanical Engineering or Materials Engineering, Chemical or Reservoir Engineering, Petroleum Engineering
- Practical experience and knowledge specific to numerical (such as finite element analysis) and physical modeling
- Practical experience and knowledge specific to materials lab testing

The secondary tier of criteria should include the following:

- No more than two persons from petroleum and gas industry
- At least one from outside of the petroleum and gas industry

Reviewers may be selected from academia, industry, and federal government. The group of reviewers shall not include multiple reviewers from the same affiliation and shall strive to include various perspectives on the issue considered.

Expected Number of Reviewers:

Three reviewers, plus contractor oversight, and writing personnel.

Requisite Expertise:

- **Educational qualifications.** Advanced degree preferred in one of the engineering fields listed in primary criteria- Ph.D., Sc.D., D.Eng., or MS- from an institution with a strong pedigree (e.g. from a high caliber institution). Experts with only a bachelor's degree should have other experience and or a record of significant accomplishments indicating their expertise.
- **Experience or knowledge of a particular technical area**. Subject Matter Experts have at least five years of experience in a relevant field, have peer-reviewed journals, other publications, and/or patents on evaluated technology, have relevant modeling experience, and have often managed a public policy program that has had a national impact.
- **Certifications.** May be a Professional Engineer

- **Recognition as an expert:** Have participated in government or industry panels, are recognized by colleagues as an expert in the field, and may have received a prestigious award such as the National Medal of Science, American Chemical Society National Award, Young Investigator Award, R&D 100 Award, or other awards specific to technology (e.g., Fuel Cell Seminar Award).
- **Key Society Membership**. Qualified experts may be members or technical leaders of a society like the National Academy of Sciences (NAS), the National Academy of Engineering (NAE), the American Physics Society, a National Laboratory Fellow, etc

Opportunity for Public Comment:

At the time of this peer review plan's posting, the draft research product being peer reviewed will be available for viewing through the BSEE website as well as available for public commenting through regulations.gov. BSEE welcomes public commenting within the 30-day window provided, especially from those with experience in the subject of this research. The agency will provide public comments on the draft research product that are deemed significant and relevant to the peer reviewers to address during their review.

BSEE also welcomes public commenting within the same 30-day window on the adequacy of this peer review plan. The agency will consider adjustments to the peer review plan deemed significant and relevant.

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