POLICY ISSUE
NOTATION VOTE

RESPONSE SHEET

TO: Carrie M. Safford, Secretary

FROM: Chair Hanson

SUBJECT: SECY-24-0008: Micro-Reactor Licensing and Deployment Considerations: Fuel Loading and Operational Testing at a Facility

Approved X **Disapproved** ____ **Abstain** ____ **Not Participating** ____

COMMENTS: **Below** ____ **Attached** X **None** ____

CHRISTOPHER HANSON

Digitally signed by CHRISTOPHER HANSON
Date: 2024.06.07 08:48:45 -04'00'

Signature
Christopher T. Hanson

Date **06/07/2024**

Entered in STAR
Yes X
No ____

Chair Hanson's Comments on SECY-24-0008, "Micro-Reactor Licensing and Deployment Considerations: Fuel Loading and Operational Testing at a Facility"

Stakeholder interest in factory-fabricated micro-reactors continues to grow, and developers are seeking clarity on regulatory issues affecting deployment. I applaud the staff for thinking creatively about how to accommodate potential micro-reactor deployment models while maintaining our critical role as a safety regulator. The staff leans in to meeting near-term needs by identifying policy issues for Commission consideration today that do not require regulatory or statutory changes, while also identifying additional issues for potential future consideration. This is exactly the kind of risk-informed and flexible approach that is needed for the agency to confidently face a rapidly changing energy environment.

It is imperative for the Commission to act swiftly in order to signal the agency's readiness and flexibility with regard to micro-reactor deployment. This issue will continue to evolve, and no doubt will require further Commission consideration; in the meantime, the staff has provided timely and thoughtful recommendations to support agency safety reviews of near-term deployment scenarios. Therefore, I approve the staff's recommended Options 1b, 2b, and 3b as discussed below.

In this paper, the staff focuses on three micro-reactor policy issues for near-term resolution while acknowledging the need to address additional regulatory issues in the future. Specifically, the staff recommends: (1) taking the position that factory-fabricated modules with "features to preclude criticality" would not be considered in operation when loaded with fuel (Option 1b); (2) authorizing factory fuel loading under a Part 70 license as long as the module includes "features to preclude criticality" (Option 2b); and (3) allowing the use of non-power reactor regulations to authorize operational testing of commercial micro-reactors at a factory (Option 3b).

Current NRC policy identifies fuel loading as the beginning of reactor operation. Consequently, under this existing policy, a factory-fabricated micro-reactor module would be required to have a Part 50 facility operating license (OL) or a Part 52 combined license (COL) if fuel is loaded at the factory, regardless of whether it is being tested. The resulting regulatory steps would require preparation of a safety evaluation report and an environmental impact statement; a review by the Advisory Committee on Reactor Safeguards; mandatory and contested hearings; and implementation of operational programs such as security, emergency preparedness, fitness-for-duty, and operator training and qualification.

Requiring an OL or a COL at the fuel-loading stage for factory-fabricated micro-reactor modules does not reflect the risks posed by only loading fuel. With this in mind, the staff have adopted the position that factory-fabricated micro-reactor modules that are loaded with fuel but have "features to preclude criticality" need not be considered "in operation" for the purposes of our regulatory framework. Instead, the staff proposes authorizing factory fuel loading under a Part 70 license in lieu of requiring an OL or a COL at that stage. "Features to preclude criticality" would ensure that a factory-fabricated module would not attain criticality and include sufficient margin. Further, with the criticality safety controls required by a Part 70 license, the presence of fuel in the module would not create a nuclear hazard different than the presence of the same fuel in a storage location or container licensed under Part 70. This proposed approach could improve near-term regulatory efficiency for licensing of factory-fabricated micro-reactor modules while providing an added potential safety benefit by assuring that fuel is handled in a controlled environment at the factory.

In the paper, the staff also addresses the topic of authorizing operational testing of commercial micro-reactors at a factory. Providing an option to verify operational aspects at this stage could support certain micro-reactor deployment models. If pursued, limitations placed on the reactor's maximum power level and cumulative operating times would result in sufficiently low radionuclide inventories and correspondingly low risk to the public in the unlikely event of an accident. Operational testing at a factory could provide the manufacturer an opportunity to identify and correct issues early, potentially avoiding redundant transportation of modules back and forth between the deployment sites and the factory.

To right-size the regulatory footprint, the staff recommends Option 3b, which would apply the non-power reactor regulations to authorize operational testing at a factory. The staff notes that such an approach would be consistent with the risks associated with limited operation of the micro-reactor for the purpose of testing. The staff further states that using well-established, performance-based regulations for non-power reactors as a starting point would minimize the need to tailor power reactor safety regulations on a case-by-case basis.

I agree with the staff's analysis. The staff's recommendations are risk-informed, and they enhance regulatory clarity for near-term micro-reactor applicants while continuing to provide reasonable assurance of adequate protection of public health and safety.

Finally, in the enclosure, "Technical, Licensing, and Policy Considerations for Factory-Fabricated Micro-Reactors," the staff identifies a suite of additional issues, including timeframes for authorization at a site, replacement of modules at a site, autonomous and remote operation, transportation, storage of spent fuel, and decommissioning. While the staff commendably proposes strategies and next steps for addressing these issues, the staff does not go beyond our existing regulations or statutory authorities. In addition to subsequent papers that may be submitted to the Commission on policy or regulatory issues, the staff should analyze what changes could or should be made to the Atomic Energy Act to better accommodate the production and deployment concepts currently under consideration, while preserving the NRC's core mission in safety, security, and environmental protection. The staff should submit analysis to the Commission in the form of a notation vote paper within six months of the date of this Staff Requirements Memorandum.