POLICY ISSUE
NOTATION VOTE

RESPONSE SHEET

TO: Brooke P. Clark, Secretary

FROM: Commissioner Baran

SUBJECT: SECY-23-0001: Options for Licensing and Regulating Fusion Energy Systems

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

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

Entered in STAR
Yes X
No ____

Jeffery M. Baran
Digitally signed by Jeffery M. Baran
Date: 2023.03.08 15:52:29 -05'00'

Signature

3/8/23

Date

Commissioner Baran's Comments on SECY-23-0001,
"Options for Licensing and Regulating Fusion Energy Systems"

With recent advances in the research and development of fusion energy systems, now is the time to begin establishing a regulatory framework for this technology. Although the precise contours of an operational fusion energy system are still being set, there is broad technical agreement on likely design characteristics and the potential hazards to consider. Currently proposed fusion energy systems would not use uranium, plutonium, or thorium, would not produce high-level waste, would not present the possibility of a self-sustaining neutron chain reaction, and would shut down on their own during accident scenarios. The NRC staff therefore expects that "the safety focus of fusion energy systems will be on the control, confinement, and shielding of radioactive material present at the site rather than on the performance and control of the device."[1] For these reasons, the NRC staff, Agreement States, international counterpart regulators, and many other stakeholders believe that near-term fusion energy systems are more appropriately regulated under the Part 30 byproduct material framework rather than the Part 50 utilization facility framework used for fission reactors. I agree.

A byproduct material approach will involve a limited-scope rulemaking that would mostly consist of definitions related to fusion energy systems and a description of what is required in a fusion application. The rule could make changes to Part 30 to facilitate fusion reviews or create a new, stand-alone fusion subpart.

The remaining question is whether the rule should also establish decision criteria to determine whether "[l]arger, higher hazard commercial fusion energy systems that differ from the characteristics of near-term facilities" should be licensed under Part 30 or Part 50.[2] The staff recommends this hybrid approach, as does the Advisory Committee on Reactor Safeguards. The main advantage of including decision criteria is that the rule would be more technology-neutral and account for the possibility that "future concepts could be developed that have different risk profiles and pose more significant hazards to public health and safety."[3] On the other hand, there is widespread technical agreement that the "near-term" technologies of the coming years would more appropriately fit in the Part 30 framework. In my view, a substantial drawback of the hybrid option is that it creates regulatory uncertainty for these near-term designs about whether they could unexpectedly end up in the Part 50 framework at the conclusion of the rulemaking. This would dramatically impact the applicable regulatory requirements and even who is doing the regulating, as Agreement States could license fusion energy systems under Part 30 but not Part 50.[4] Rather than have decision criteria as an open question in the limited-scope rulemaking, I think it would be better to focus on what is needed to review near-term designs. I therefore approve the staff's Option 2 of regulating fusion energy systems under a byproduct material framework. If, at some point in the future, the NRC staff, in consultation with the Agreement States, determines that an anticipated fusion design presents hazards well beyond those of near-term fusion technologies, the staff should notify the Commission.

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[1] SECY-23-0001 at 7.
[2] *Id.* at 18.
[3] *Id.* at 19.
[4] *Id.* at 16.