POLICY ISSUE
NOTATION VOTE

RESPONSE SHEET

TO: Brooke P. Clark, Secretary

FROM: Commissioner Wright

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

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

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

David A. Wright

Digitally signed by David A. Wright
Date: 2023.03.09 14:27:24 -05'00'

David A. Wright

Entered in STAR

Yes X

No ____

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

I agree with my colleagues that it's an opportune time for the NRC to clarify which regulatory framework should be used for fusion energy systems. I appreciate the thoughtful and well-researched options that the staff has presented to the Commission in SECY-23-0001. One of these options is for us to treat fusion energy systems as "utilization facilities" under the Atomic Energy Act.[1]

If we chose this option, we would be applying certain regulatory requirements that, while appropriate for fission reactors may not be appropriate or necessary to assure the safe operation of fusion energy systems.

As I think about this issue, I agree with Commissioner Caputo that the *Efficiency* Principle of Good Regulation comes to mind. This principle states that "regulatory activities should be consistent with the degree of risk reduction that they achieve." Given the inherent safety and safeguards characteristics of the fusion energy systems that have been described to the Commission to date, imposing the requirements associated with utilization facilities would not, in my opinion, be consistent with the relatively small level of risk reduction that would likely be achieved.

I'm basing my assessment on the expected characteristics of fusion energy systems that the staff identified as important in SECY-23-0001, paraphrased slightly here:

1. No fissionable material is present and thus criticality is not possible.
2. Energy and radioactive material production from fusion reactions cease without any intervention in off-normal events and accident scenarios.
3. No active post-shutdown cooling of the structures that contain radioactive material is required to maintain radiological confinement (i.e., prevent vessel breach).
4. Offsite consequences during credible accident scenarios (including sabotage) are expected to result in a dose to a person offsite of less than 1 rem effective dose equivalent.
5. No self-sustaining fusion reaction is possible without active engineered features (e.g., plasma confinement mechanisms, vacuum maintaining systems, fuel injection, internal heating).
6. The systems do not use or produce, and cannot be readily adapted to produce, special nuclear material such that they would present a significant proliferation risk, nor are the currently contemplated systems currently included on the trigger list associated with the Treaty on Non-Proliferation of Nuclear Weapons.

Therefore, any fusion energy system with the above six characteristics should be regulated under the NRC's byproduct material framework (Option 2). The staff should continue to monitor

[1] As discussed in SECY-09-0064, the drafters of the Atomic Energy Act relied on this expansive definition, in part, to specifically allow the Atomic Energy Commission to assert its authority over fusion energy. *See also* S. Rep. 83-1699 (1954). Using this definition, the Commission has already made clear that "the NRC has regulatory jurisdiction over commercial fusion energy devices whenever such devices are of significance to the common defense and security or could affect the health and safety of the public…." SRM-SECY-09-0064.

the landscape of fusion energy system designs and return to the Commission for direction if they identify future designs that do not display the above six characteristics.

In addition, consistent with how other material licenses and technologies are regulated under the NRC's byproduct material framework, the staff should develop a new volume for NUREG-1556 dedicated to fusion energy systems so as to provide consistent guidance across the National Materials Program.