

FUSION INDUSTRY ASSOCIATION

Fusion Industry Association
800 Maine Ave SW
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Washington, DC 20024

August 25, 2022

The Honorable Christopher T. Hanson
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C., 20555-0001

Dear Chairman Hanson:

As the unified voice of the fusion industry, the Fusion Industry Association (“FIA”) is writing to the U.S. Nuclear Regulatory Commission (“NRC”) to share FIA’s views regarding the appropriate regulatory framework for fusion energy.

This letter is a follow up to presentations given by FIA and its member companies during the NRC’s public meetings that it held over the past two years. FIA would like to commend the NRC staff on its openness and engagement with FIA and other fusion stakeholders during these meetings. From FIA’s perspective, NRC staff have focused on better understanding the technical issues and hazards presented by fusion, and FIA appreciates the willingness of staff to engage with FIA on these issues.

As discussed in those meetings, FIA understands that the NRC staff is working on a SECY paper to provide the Commission with potential options for regulating fusion energy. FIA understands the paper could provide the Commission with several options: regulating fusion under the NRC’s Part 30 regulations; regulating fusion as a utilization facility; or perhaps developing an amalgamated version combining aspects of Part 30 and a utilization approach.

As expressed in its presentation at the NRC’s June 7, 2022 Public Meeting, the FIA strongly supports regulation under the Commission’s existing Part 30 specific licensing regulations. First, in principle, the technical case should lead the way for the Commission’s decision. Part 30 is the most technically appropriate fit for fusion devices. While commercial fusion energy production will be a new technology, fusion research devices are already regulated under Part 30. The

radiological hazards presented by fusion devices—tritium management, radiation produced during operations, and low-level waste—are well understood and have been regulated under Part 30 in relation to other technologies for decades. The Part 30 approach would therefore best match fusion to similar technologies regulated by the Commission, including particle accelerators, industrial radiography devices, or irradiators. The NRC’s experience safely regulating these technologies and their related hazards shows that Part 30 is fully capable of ensuring adequate protection of public health and safety.

Part 30 is also the best approach to support the emerging U.S. fusion industry. Part 30’s specific licensing process is well understood and would thus provide near-term regulatory certainty needed by developers and investors. Fusion developers plan to begin the detailed designing of first commercial plants within the next 12-18 month, and Part 30 regulation will allow companies to design these plants to an established regulatory framework, avoiding unnecessary delays created by new rulemaking.

FIA also would like to express its concerns regarding the potential to employ a utilization facility framework for the regulation of fusion technologies. The Atomic Energy Act’s provisions concerning utilization facilities are focused on the unique risks of fission: criticality; fuel and high-level waste management; and the use of special nuclear material. Fusion, on the other hand is a fundamentally different process from fission with fundamentally different considerations. Unlike fission, fusion does not involve the use of special nuclear material, does not present criticality concerns, and does not create spent nuclear fuel or long-term high-level waste. Fusion reactions are difficult to sustain, and any disruption of the fusion device results in an immediate shutdown of the fusion reaction; a fusion power plant is physically incapable of failing in a way that leads to a meltdown.

Because of this difference, many of the requirements applicable to utilization facilities, such as Price Anderson Act insurance, extended licensing processes, and restrictions on foreign investment, simply do not have relevance for fusion devices and would represent unnecessary regulatory burden. These restrictions are not commensurate with the risks and are wholly unnecessary to provide reasonable assurance of adequate protection.

FIA is also concerned about the possibility that the staff could suggest an agglomerated framework of other regulations as a potential option for Commission consideration. At this point, it is quite unclear what such a proposal would look like, but we are concerned that creating a potpourri of existing and new regulatory frameworks would likely require extensive and needlessly complex rulemaking. This would create significant regulatory uncertainty for developers, delay plans for domestic first commercial plants, and potentially lead to a focus on non-U.S. deployment of early commercial fusion plants. A muddled framework that labels fusion devices as utilization facilities, but scales back certain requirements would nonetheless impose many of the Atomic Energy Act’s mandatory and burdensome requirements that are not appropriate for these technologies.

Finally, a technical assessment will show that existing regulations under Part 30 are sufficient today to protect the health and safety of the public, while also supporting the growth of the industry. There is no immediate need to undergo a substantial new Part 30 regulatory rulemaking process. Right now, there is inadequate licensing and operating experience to guide such an undertaking. Any near-term attempt to develop a new framework within Part 30 would be hampered by the lack of operational experience with a fully integrated fusion power plant – even as many subsystems are already well understood. Industry, stakeholders, and regulators need experience to know what issues are best addressed via regulatory standards versus a review of individual license applications. Such a new rulemaking at this time could result in ill-fitted regulations that would increase regulatory uncertainty on industry as they prepare for design and license applications for first commercial plants. This could slow licensing efforts and burden already-stretched NRC resources, only to then require revisions later once experience had been gained.

FIA therefore believes the Commission and its Agreement State partners can license individual fusion facilities under the Part 30 specific licensing framework, leveraging existing rules, guidance, and practice. Any changes to the regulations at this time should be tightly circumscribed to eliminate potential confusion with the regulations' current treatment of fusion machines as particle accelerators (similar to the Commission's clarification with the definition of "cyclotrons"). Once the first commercial plants have been licensed and completed significant time in operation, gaining sufficient lessons learned from operational experience, the Commission could revisit whether fusion-specific Part 30 tools would be useful to facilitate licensing.

The FIA also believes the Commission possesses sufficient legal discretion to adopt a Part 30 approach. The Atomic Energy Act grants the Commission extremely broad discretion to choose the technically appropriate regulatory framework to ensure adequate protection of public health and safety. The Commission's discretion under the Atomic Energy Act is considered "virtually unique" in the breadth of responsibility which it ascribes to the Commission. Siegel v. Atomic Energy Comm'n, 400 F.2d 778, 783 (D.C. Cir. 1968). Courts have long recognized that the Commission may rely on its "technical judgment" rather than "a mechanical verbal formula or set of objective standards" in determining how best to ensure adequate protection. Union of Concerned Scientists v. U.S. Nuclear Regul. Comm'n, 880 F.2d 552, 558 (D.C. Cir. 1989). Although the Atomic Energy Act does not specifically address fusion, it does address the specific radiological risks presented by fusion. There is no question that the NRC can and has regulated all these risks.

Moreover, it is clear that fusion devices meet the Commission's legal definition of particle accelerators. All fusion devices operate by "accelerating...charged particles in a vacuum and... discharging the resultant particulate or other radiation into a medium in energies usually in excess of 1 MeV." 10 C.F.R. § 30.4. Byproduct material created by the fusion device, such as tritium for ongoing operations, or low-level waste, would fall within the Commission's existing authority for regulating accelerator-produced byproduct material and wastes.

Adopting the Part 30 approach is also fully consistent with the Nuclear Energy Innovation and Modernization Act (“NEIMA”) requirement that the Commission enact a regulatory framework for fusion by 2027. NEIMA includes fusion in its definition of advanced reactor but does not prescribe the regulatory approach the Commission must take with fusion, only the timeline. Congress’s inclusion of fusion in NEIMA, without more granular guidance, is evidence that Congress has entrusted the NRC with wide discretion to apply its technical judgment in regulating this new technology. To the extent a rulemaking is required, a simple rulemaking stating that fusion will continue to be regulated under existing Part 30 regulations would be fully sufficient to satisfy NEIMA. FIA stands ready to work with the Commission if it determines that legislative clarification is desirable. However, the language in the Atomic Energy Act and NEIMA already gives the Commission ample discretion to regulate fusion under Part 30.

Commercial fusion energy will provide clean power for everyone that is safe, affordable, and limitless; can play a major role in addressing climate change; and provide a major stimulus to the U.S. economy. The U.S. is currently the world leader in fusion technology. However, there is a global race to develop and commercialize fusion energy. Other countries have already begun exploring frameworks which would regulate fusion under a materials approach, like Part 30. While economic considerations should not drive the Commission’s determination, FIA wishes to stress that an unnecessarily burdensome approach, or one that delays commercial plant development with rulemaking, may force developers to look elsewhere to deploy their technologies, ceding the U.S.’s lead in this sector. Therefore, FIA urges the Commission to adopt an approach that continues licensing fusion devices under the Part 30 process. This approach best fits fusion to the NRC’s historic regulation of technologies with similar risks, supports the U.S.’s emerging fusion industry, and ensures protection of public health and safety.

Sincerely,



Andrew Holland
Chief Executive Officer
Fusion Industry Association

CC:

Commissioner Jeff Baran, U.S. NRC;
Commissioner David Wright, U.S. NRC;
Commissioner Annie Caputo, U.S. NRC;
John Lubinski, Director of the Office of Nuclear Material Safety and Safeguards, U.S. NRC;
Andrea Veil, Director of Nuclear Reactor Regulation, U.S. NRC;
Marian Zobler, General Counsel, U.S. NRC;
Brooke Clark, Secretary of the Commission, U.S. NRC;
Dan Dorman, Executive Director for Operations, U.S. NRC