

Fusion Rulemaking: Conforming Changes with the ADVANCE Act



NRC Public Meeting

August 14, 2024



United States Nuclear Regulatory Commission

Protecting People and the Environment

Meeting Agenda

Time	Topic	Speaker
1:00 pm	Welcome & Meeting Logistics	Dennis Andrukat
1:10 pm	Opening Remarks	Kevin Williams
1:15 pm	NRC Presentation: Changes Specific to Fusion in the ADVANCE ACT of 2024	Duncan White
1:30 pm	Questions & Answer Session	All
1:50 pm	Closing Remarks & Adjourn	Dennis Andrukat

Topic times are estimated and, depending on the participation level, the meeting could adjourn earlier than scheduled. If there are concerns with a potential early meeting adjournment, please inform the point of contact for this meeting.




Opening Remarks

Kevin Williams, Director

Division of Materials Safety, Security, State, and Tribal Programs

Office of Nuclear Material Safety and Safeguards

U.S. NRC



Changes Specific to Fusion in the ADVANCE Act of 2024

Duncan White

Division of Materials Safety, Security, State, and Tribal Programs

Office of Nuclear Material Safety and Safeguards

U.S. NRC



ADVANCE Act of 2024

The Accelerating Deployment of Versatile, Advance Nuclear for Clean Energy (ADVANCE) Act was signed into law on July 9, 2024

Adds a new definition of “fusion machine” to the Atomic Energy Act of 1954, as amended (AEA)

Incorporates “fusion machine” into the definition of “byproduct material” in Section 11e(3)(B) of the AEA

Made conforming changes to the Nuclear Energy Innovation and Modernization Act (NEIMA) to replace the term “fusion reactor” with “fusion machine”

Tasked the Commission with performing a study on mass-production of fusion machines and submitting a report to Congress on the results *(this is separate from this rulemaking effort)*

Preliminary Proposed Rule Language: Revised Definitions

Byproduct material

any material that—(A) has been made radioactive by use of a particle accelerator, including by use of a fusion machine; and (B) if made radioactive by use of a particle accelerator that is not a fusion machine, is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity;

[10 CFR Parts 20, 30, 37, 50, 72, 110, 150, 170, and 171]

Fusion machine [replaces definition of “fusion system”]

a machine that is capable of—(1) transforming atomic nuclei, through fusion processes, into different elements, isotopes, or other particles; and (2) directly capturing and using the resultant products, including particles, heat, or other electromagnetic radiation.

[10 CFR Parts 20 and 30]

Preliminary Proposed Rule Language: Revised Definition

Particle accelerator

means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 megaelectron volt. For purposes of this definition, accelerator is an equivalent term. For the purposes of this part, the term particle accelerator does not include fusion machines.

[10 CFR Parts 20, 30, and 110]

Proposed Revision to 10 CFR 20.2008

- (a) Licensed material as defined in paragraphs (3) and (4) of the definition of *Byproduct material* set forth in §20.1003 may be disposed of in accordance with part 61 of this chapter, even though it is not defined as low-level radioactive waste, except that waste resulting from fusion machines that differs significantly from the waste types and radionuclide concentrations considered during the development of 10 CFR part 61 must be disposed of in a disposal facility that has completed a site-specific intrusion assessment that demonstrates the projected dose to an individual who inadvertently intrudes into the waste at the facility will be less than 0.5 rem (5 (mSv)) per year. Therefore, any licensed byproduct material being disposed of at a facility, or transferred for ultimate disposal at a facility licensed under part 61 of this chapter, must meet the requirements of §20.2006.

Note: “Fusion machine” will be licensed material pursuant to paragraph (3) of the definition of “Byproduct material” in §20.1003.

Fusion Machine v. Particle Accelerator



Particle accelerator requirements already exist in 10 CFR 30.32(j)

Need to distinguish new fusion machine requirements from existing particle accelerator requirements to provide regulatory clarity since these two technologies could have different hazard profiles

The definition of particle accelerator in 10 CFR Parts 20, 30, & 110 would be amended and a separate definition of fusion machine in 10 CFR Parts 20 & 30 to make this regulatory distinction

Question & Answer Session

We encourage questions from all stakeholders during this meeting regarding the presented preliminary changes resulting from the ADVANCE Act. We are not officially accepting comments today and will not provide any formal responses to any feedback provided during this meeting.



Upcoming Milestones



Additional Information

Public Meeting Information

- *March 18, 2024: Meeting summary (ADAMS Accession No. ML24067A237)*
- *January 17, 2024: Meeting summary (ADAMS Accession No. ML23355A142)*
- *November 9, 2023: Meeting summary (ADAMS Accession No. ML23258A182)*
- *November 1, 2023: Meeting summary (ADAMS Accession No. ML23258A169)*
- *October 11, 2023: Meeting summary (ADAMS Accession No. ML23258A146)*
- *July 12, 2023: Meeting summary (ADAMS Accession No. ML23258A146)*

- *Future Public Meeting: To Be Held During Public Comment Period*

Rule Information

- NRC Public Website: [Fusion Machines](#)
- Rulemaking Docket ID: [NRC-2023-0071](#) (www.regulations.gov)

Thank You!

Contacts

Dennis Andrukat, *Rulemaking Project Manager*

Dennis.Andrukat@nrc.gov

Duncan White, *Technical Lead*

Duncan.White@nrc.gov

Meeting Notice / Feedback Form: <https://www.nrc.gov/pmns/mtg?do=details&Code=20240964>