

Rulemaking: Regulatory Framework for Fusion Systems

NRC Public Meeting
March 18, 2024

Agenda

Time	Topic	Speaker
1:00 pm	Welcome & Meeting Logistics	Dennis Andrukat
	Opening Remarks	Theresa Clark
	NRC Presentation: - Status of Preliminary Proposed Rulemaking and Guidance - Changes to Preliminary Proposed Rule Language	Duncan White
	Questions & Answer Session / Public Feedback	All
4:50 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



Theresa Clark, Deputy Director
Division of Materials Safety, Security, State, and Tribal Programs
Office of Nuclear Material Safety and Safeguards
US NRC



Changes to Preliminary Proposed Rule Language

Duncan White

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

Office of Nuclear Material Safety and Safeguards

US NRC


Preliminary Proposed Rule Language:

Revised Definitions

Revisions:

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. For purposes of this definition, accelerator is an equivalent term. **Particle accelerators that induce plasma fusion to produce byproduct material are included in fusion systems as defined in this section. [10 CFR Parts 20, 30, 110]**

Fusion system means a system that, through use of byproduct material or to produce byproduct material, induces **plasma fusion** ~~reactions~~. **The term fusion system includes particle accelerators that induce plasma fusion.** **The term fusion system also and** includes any **associated** radiation, radioactive material, and supporting structures, systems, and components that are used to contain, process, or control radiation and radioactive materials **used in or resulting from plasma fusion. [10 CFR Parts 20, 30]**



Preliminary Draft Licensing Guidance for Fusion Systems

Duncan White

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

Office of Nuclear Material Safety and Safeguards

US NRC

Status of Fusion Licensing Guidance Development

NUREG-1556, Volume 22

- Preliminary draft version completed and shared with stakeholders
- Additional changes to the preliminary draft guidance may be identified during NRC internal and Agreement State reviews
- Draft will be published for formal comment in the *Federal Register* along with the proposed rule

Preliminary Draft NUREG-1556 Volume 22*

Consistent with
NUREG-1556
Series format

Volumes 6, 7,
12, 21

Fusion design
neutral

Preliminary
Draft Guidance
ML24067A227

*Appendix A not included in this preliminary version. However, Appendix A will be part of the draft guidance document that will be published with the proposed rule for official commenting.

Contents of an Application

- 8.1 Item 1: License Action Type
- 8.2 Item 2: Name and Mailing Address of Applicant
 - 8.2.1 Notification of Bankruptcy Proceedings
 - 8.2.2 Timely Notification of Transfers of Control
- 8.3 Item 3: Address(es) Where Licensed Material Will Be Used or Possessed
- 8.4 Item 4: Person To Be Contacted About This Application
- 8.5 Item 5: Radioactive Material
 - 8.5.1 Unsealed and Sealed Byproduct Material
 - 8.5.2 Financial Assurance and Recordkeeping for Decommissioning
 - 8.5.3 Environmental Review

Contents of an Application

8.6 Item 6: Purpose(s) for Which Licensed Material Will Be Used

8.7 Item 7: Individual(s) Responsible for Radiation Safety Program and Their Training and Experience

8.7.1 Radiation Safety Officer

8.7.2 Individuals Authorized To Handle Licensed Material

8.8 Item 8: Training for Individuals Working in or Frequenting Restricted Areas

Contents of an Application

8.9 Item 9: Facilities and Equipment

8.9.1 General Description of Facility and Site

8.9.2 Access Control

8.9.3 Shielding

8.9.4 Fire Protection

8.9.5 Radiation Monitors

8.9.6 Tritium Handling System

8.9.7 Breeding Blankets

8.9.8 Heat Exchange Systems

8.9.9 Power Failures

Contents of an Application

8.10 Item 10: Radiation Safety Program

8.10.1 Audit Program

8.10.2 Radiation Monitoring Instruments

8.10.3 Material Control and Accountability

8.10.4 Occupational Dose

8.10.4.1 Dosimetry

8.10.4.2 Bioassay Program

8.10.4.3 ALARA

8.10.4.4 Minimization of Contamination

8.10.5 Public Dose

Contents of an Application

8.10 Item 10: Radiation Safety Program (Continued)

8.10.6 Safe Operating and Emergency Procedures

8.10.6.1 Operating Procedures

8.10.6.2 Maintenance

8.10.6.3 Emergency Procedures

8.10.7 Surveys and Leak Tests

8.10.8 Transportation

8.10.9 Evaluation to Determine Need for Offsite Emergency Plan

8.10.10 Environmental Surveillance

8.10.11 Security Program

Contents of an Application

8.11 Item 11: Waste Management

8.12 Item 12: License Fees

8.13 Item 13: Certification

Appendices

Appendix A Suggested Format for Providing Information Requested in Items 5 Through 11 of NRC Form 313 for a Possession License

Appendix B Checklist for Requests to Withhold Proprietary Information from Public Disclosure (Under 10 CFR 2.390)

Appendix C Commencement of Construction at Existing and Proposed Byproduct, Source, and Special Nuclear Material Facilities

Appendix D Typical Duties and Responsibilities of the Radiation Safety Officer

Appendix E Radiation Safety Training

Appendix F Facilities and Equipment Considerations

Appendix G Sample Audit Program

Appendix H Radiation-monitoring, Instrument Specifications, and Model Survey Instrument and Air-sampler Calibration Program

Appendices

Appendix I Material Receipt and Accountability

Appendix J Guidance for Demonstrating that Unmonitored Individuals are Not Likely to Exceed 10 Percent of the Allowable Occupational Dose Limits

Appendix K Methodology for Determining Public Dose

Appendix L Typical Notification And Reporting Requirements

Appendix M General Topics for Safe Use of Radionuclides and Model Emergency Procedures

Appendix N Radiation Safety Survey Topics

Appendix O Model Leak Test Program and Procedures

Appendix P Applicable U.S. Department of Transportation Regulations

Appendix Q Model Waste Management Procedures

Question & Answer Session

We encourage questions and feedback from all stakeholders during this meeting on the development of the proposed rule and preliminary draft guidance. We are not officially accepting comments today and will not provide any formal responses to any feedback provided during this meeting.



Upcoming Events/Milestones

Proposed Rule Schedule

- Proposed rule and draft guidance to Commission by September 2024

Additional Information

Public Meeting Information

- *January 17, 2024: Meeting summary (ADAMS Accession No. ML23355A142)*
- *October 11, 2023: Meeting summary (ADAMS Accession No. ML23258A146)*
- *November 1, 2023: Meeting summary (ADAMS Accession No. ML23258A169)*
- *November 9, 2023: Meeting summary (ADAMS Accession No. ML23258A182)*
- Meeting Notice / Feedback Form:
<https://www.nrc.gov/pmns/mtg?do=details&Code=20240278>

Public Information

- NRC Public Website: <https://www.nrc.gov/materials/fusion-energy-systems.html>
- Rulemaking Docket ID: [NRC-2023-0071 \(www.regulations.gov\)](https://www.regulations.gov)

Thank You!

Contacts

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