

U.S. Nuclear Regulatory Commission Public Meeting Summary

February 5, 2024

Title: Proposed Rule: Regulatory Framework for Fusion Systems

Meeting Identifier: [20231416](#)

Date of Meeting: January 17, 2024

Location: Webinar (via Microsoft Teams)

Type of Meeting: Information Meeting with a Question-and-Answer Session

Purpose of Meeting:

The U.S. Nuclear Regulatory Commission (NRC) staff hosted a public meeting on the proposed rule that would establish the regulatory framework for fusion systems under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material." The purpose of this meeting was to share the staff's progress on the preliminary draft NUREG-1556, Volume 22 guidance and to receive feedback from external stakeholders on the proposed rule that would develop a regulatory framework under 10 CFR Part 30 for fusion systems. Stakeholders were invited to give presentations on their feedback on the development of the proposed rule and preliminary draft guidance, to which the staff received three stakeholder presentation.

General Details:

The NRC is proposing to amend its regulations in 10 CFR 30 to provide a regulatory framework for fusion energy systems.

As part of the proposed rule, the NRC staff also intends to issue, for public comment, the following supporting materials:

- draft guidance under a new volume (Volume 22) of NUREG-1556, "Consolidated Guidance About Materials Licenses"
- a draft regulatory analysis (cost analysis)
- an environmental assessment
- a supporting statement for any proposed information collections under the Paperwork Reduction Act

This January 17, 2024, meeting, as a follow-up to the previous three public meetings (October 11, 2023, November 1, 2023, and November 9, 2023), was focused on feedback from external stakeholders and sharing the latest preliminary draft guidance.

During this meeting, the staff also provided updates on the status of the rulemaking and discussed the latest preliminary draft guidance regarding emergency preparedness and waste management. The virtual meeting consisted of one NRC presentation and three external stakeholder presentations followed by a question-and-answer session where the public was provided an opportunity to pose any feedback and questions to the NRC. The meeting was well attended by 138 participants, including academia, Agreement

States, federal agencies, fusion industry, Fusion Industry Association, international stakeholders, non-government organizations, other members of the public, and NRC staff. The meeting was transcribed, and the transcription can be found in the Agencywide Documents Access and Management System (ADAMS), [ML23355A172](#).

Summary of Presentation:

Dennis Andrukat of the NRC opened the meeting, introducing himself as the rulemaking project manager for this rule and acting as the meeting's facilitator. He described the purpose of the meeting which was to provide specific topics of the preliminary proposed rule and guidance, and to listen to public feedback on what the rulemaking should accomplish. He then discussed the meeting logistics and advised participants on the features of the webinar platform. He noted the agenda in which the first half of the meeting included presentations by the NRC staff and three external stakeholders, while the remaining half of the public meeting consisted of an open question and answer session. Instructions were provided for how members of the public attending via Microsoft Teams or via the phone could ask questions or offer comments. He encouraged public participation during the meeting from all stakeholders but noted that the NRC will not provide any formal responses to the feedback and questions offered during the meeting. He noted that this meeting will be transcribed, and that speakers needed to identify themselves and their affiliation for the record. Additional meeting logistics were provided before introducing the speakers for this public meeting.

He then turned the meeting over to the NRC's Theresa Clark, Deputy Director for the Division of Materials Safety, Security, State, and Tribal Programs (MSST) in the Office of Nuclear Material Safety and Safeguards (NMSS). She welcomed everyone and gave the opening remarks before turning the meeting over to Duncan White. She communicated that these public meetings and the stakeholder feedback do help the NRC staff better understand stakeholder ideas and concerns related to the development of the proposed rule.

Duncan White, of the NRC (NMSS/MSST/State Liaison and Agreement Programs Branch (SLPB)), is the rulemaking's technical lead for the NRC and commenced with the presentations. He began his slide presentation by providing a recent change to the preliminary proposed definition under 10 CFR 20.2008. He went on to give a high-level status of the development of the preliminary draft guidance (NUREG-1556, Volume 22).

Afterwards, the following presenters give their presentations:

- Cindy Rosales-Cooper, NRC (Office of Nuclear Security and Incident Response (NSIR)/Division of Preparedness and Response (DPR)), presented on emergency preparedness updates.
- Dr. Christianne Ridge, NRC (NMSS/Division of Decommissioning, Uranium Recovery, and Waste Programs (DUWP)), presented on waste management.
- Andrew Holland, Fusion Industry Association, presented on FIA's latest feedback.
- Andrew Proffitt, Helion, presented on Helion's latest feedback.

- Mike O'Neil and Tyler Ellis, Commonwealth Fusion Systems (CFS), presented on CFS' latest feedback.

This concluded the presentation portion of the meeting.

Public Feedback and Questions:

Below is a summary of the feedback provided by the stakeholders for the NRC staff to consider as the NRC staff develops the draft proposed rule and guidance.

- In general, stakeholders continued to have no objection for the proposed use of a 10 CFR Part 30 byproduct material regulatory framework and appreciated hearing the staff's preliminary thoughts on the specific topics presented.
- The presentations resulted in several comments, questions, and suggestions for the NRC staff to consider including, guidance, definitions, and the topics discussed.
- A stakeholder asked how the NRC plans to handle or address the various fusion system designs to avoid having numerous exemptions (e.g., would the regulations contain specific exemptions already for various designs).
- A stakeholder asked about the choice of verbs used in the preliminary draft guidance – for example, Section 8.7.2 contains the verb “use[s]” as opposed to “handle[s]” like in other volumes of NUREG-1556.
- A stakeholder asked about the Environmental Review guidance in section 8.5.3 of the preliminary draft guidance, including why is there a need to have such guidance.
- A stakeholder asked about Security guidance in sections 8.10.12, and 8.10.13 of the preliminary draft guidance, including how will the NRC separate security from material control and accountability.
- A stakeholder suggested the NRC start to consider a regulatory framework for the mass production of fusion systems, giving the Federal Aviation Administration and airplane manufacturers as an example.
- A stakeholder commented that no additional operator training, other than that presented in the existing Volume 21 of NUREG-1556, is necessary for fusion systems.
- Numerous stakeholders presented feedback related to the definitions of “fusion systems,” “fusion machines,” and “particle accelerators,” including:
 - Several stakeholders (including the stakeholder presentations) had comments regarding that fusion systems (or fusion machines) should be part of the particle accelerator definition (and not its own definition). This feedback would align with the proposed Fusion Energy Act currently with Congress and provide regulatory clarity and certainty.
 - Several stakeholders suggested the scope and intent of the Commission's direction in SRM-SECY-23-0001 in deciding to a 10 CFR Part 30 by product material framework was for fusion systems/machines to be defined within the particle accelerator definition.
 - Several stakeholders had comments that all fusion devices are particle accelerators.

- A stakeholder asked wanted to better understand why the NRC was reluctant to place fusion systems/machines under the particle accelerator definition.
- A stakeholder noted that there did not seem to be any issue with the NRC's proposed use of a standalone fusion system definition other than looking into the future and any passing of the current draft Fusion Energy Act.
- A stakeholder asked what attributes of a fusion system/machine the NRC would consider such a design to not be a particle accelerator.
- A stakeholder had a comment that the NRC staff's current proposed definition change under 10 CFR 20.2008 could conflict with the waste provisions under the Energy Policy Act of 2005.
- Numerous stakeholders presented feedback related to emergency preparedness, including:
 - Several stakeholders (including stakeholder presentations) had comments regarding the NRC's November 9, 2023, public meeting Emergency Preparedness (EP) presentation, but appeared mostly satisfied after hearing today's EP presentation (i.e., that the NRC is proposing to follow the current EP requirements/framework for 10 CFR Part 30 licensees).
 - A stakeholder asked about the NRC's expectation for how a licensee/applicant would determine the maximum dose or whether the specifics would be up to each licensee/applicant.
- Numerous stakeholders presented feedback related to waste management, including:
 - A stakeholder asked if the NRC had plans to consider and/or address recycling and clearance limits for waste.
 - A stakeholder asked if NRC would be updating the current edition of NUREG-1640, "Radiological Assessments for Clearance of Materials from Nuclear Facilities," (2003 edition) to include alloys that may be used in fusion systems (in addition to the four currently listed). The stakeholder suggested updating to be similar to IAEA's guidance that lists over 20 alloys.
- In general, stakeholders appreciated the staff's progress and interaction opportunities.

Closing:

The NRC's Dennis Andrukat made brief closing remarks, including upcoming milestones and the potential upcoming public meeting for the full preliminary draft guidance. He then shared slides containing additional information and links regarding this rulemaking project including the rule's www.regulations.gov Docket ID number (NRC-2023-0071), the public repository for key documents related to the development of this rulemaking, as well as contact information and the NRC's public website for [Fusion Systems](#).

In concluding, he informed participants of the [public meeting feedback form](#) available on the [NRC Public Meeting Schedule website](#) and ended the meeting by thanking everyone

for their time and participation and that the NRC staff will be considering the feedback received during this public meeting.

The meeting ended at 4:43pm ET.

Action Items/Next Steps:

- The staff will review the public meeting's feedback for consideration in the drafting of the rule and guidance.
- Staff will finalize and schedule any follow-up public meeting regarding the full preliminary draft guidance (The staff will make efforts to make the handout available well in advance of the meeting date).
- Staff to consider whether to hold workshops in the Spring of 2024 (related to guidance development for emergency preparedness and waste management).
- Staff to consider adding a specific request for comment to the proposed rule's *Federal Register* notice related to the uncertainty and use of a stand-alone definition for fusion system compared to the placement of fusion systems under the existing particle accelerator definition.

Public Meeting Documents:

- [ML23355A140](#) – ADAMS PACKAGE: January 17, 2023 – Public Meeting -- Proposed Rule: Regulatory Framework for Fusion Systems
 - [ML24016A118](#) – 1/17/2024 – Notice of Public Meeting to Discuss the Proposed Rule: Regulatory Framework for Fusion Systems
 - [ML23355A144](#) – 1/17/2024 – Public Meeting Presentation – Proposed Rule: Regulatory Framework for Fusion Systems
 - [ML23355A143](#) – 1/17/2024 – Public Meeting Handout – Proposed Rule: Regulatory Framework for Fusion Systems
 - [ML23355A172](#) – 1/17/2024 – Public Meeting Transcript – Proposed Rule: Regulatory Framework for Fusion Systems
 - [ML23355A142](#) – 1/17/2024 – Public Meeting Summary -- Proposed Rule: Regulatory Framework for Fusion Systems

Information Referenced:

- [ML23258A182](#) – 11/9/2023 – Public Meeting Summary -- Proposed Rule: Regulatory Framework for Fusion Systems
- [ML23258A169](#) – 11/1/2023 – Public Meeting Summary -- Proposed Rule: Regulatory Framework for Fusion Systems
- [ML23258A146](#) – 10/11/2023 – Public Meeting Summary -- Proposed Rule: Regulatory Framework for Fusion Systems
- [ML23258A145](#) – Handout: Preliminary Proposed Rule Language – October 2023
- [ML22273A178](#) – SECY-23-0001, "Options for Licensing and Regulating Fusion Energy Systems," dated January 3, 2023
- [ML23103A449](#) – SRM-SECY-23-0001, "STAFF REQUIREMENTS – SECY-23-0001 – Options for Licensing and Regulating Fusion Energy Systems," dated April 13, 2023

- [ML23354A236](#) – Letter, Fusion Industry Association to NRC dated December 15, 2023
- [ML24005A181](#) – Letter, NRC response to Fusion Industry Association’s December 15, 2023, dated January 12, 2024
- NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants”
<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0654/index.html>
- NUREG-1556, "Consolidated Guidance About Materials Licenses"
<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/index.html>
- NUREG-1640, “Radiological Assessments for Clearance of Materials from Nuclear Facilities”
<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1640/index.html>
- NRC Public Website for Fusion Systems
<https://www.nrc.gov/materials/fusion-energy-systems.html>
- NRC’s Public Rulemaking Website - Regulatory Framework for Fusion Systems
<https://rulemaking.nrc.gov/Rules/Detail/2185>
- Regulations.gov Website for Docket ID: NRC-2023-0071
<https://www.regulations.gov/docket/NRC-2023-0071>
- NRC’s Agreement States Website
<https://www.nrc.gov/agreement-states.html>

LIST OF ATTENDEES*

January 17, 2024, PUBLIC MEETING – Proposed Rule: Regulatory Framework for Fusion Systems

NRC

Aaron Kwok
Allyce Bolger
Araceli Billoch Colon
Barry Miller
Binesh Tharakan
Boby Abu-Eid
Candace Spore
Caty Nolan
Caylee Kenny
Charles Murray
Christian Einberg
Christianne Ridge**
Cindy Bladey
Cindy Rosales-Cooper**
Dave McIntyre
David Brown
David Cullison
Dennis Andrukat**
Derek Widmayer
Don Johnson
Donald Palmrose
Duane White
Duncan White**
Ethan Licon
Francheska Colón González
Gary Purdy
Greg Bowman
Helen Chang
Isaac Johnston
Jessie Quintero
Jill Shepherd
Joey Rolland
Jonathan Fiske
Joseph Staudenmeier
Kenneth Mott
Krupskaya Castellon
Linda Howell
Lisa Dimmick
Lisa London
Louis Caponi
Marilyn Diaz Maldonado
Melissa Ralph
Michael Waters
Ossy Font
Patricia Cline-Thomas
Philip Benavides
Rob Krsek
Robert Tregoning
Ronald Raunikar
Sarah Spence
Shakur Walker
Sheldon Clark
Soly Soto Lugo
Suzanne Dennis
Tammy Bloomer
Theresa Clark**
Todd Smith
Tyler Hammock
Wendy Reed

EXTERNAL STAKEHOLDERS

Aina Lagor
Alyse Peterson
Andrew Holland**
Andrew Proffitt**
Bethany Colling
Bryan Werner
Cameron Hughes
Charlyne Smith
Chris Ajemian
Chris Faranetta
Corinne Mitchell
D.R.Demers
David Reindl
David Tiktinsky
Derek (Iowa)
Devin Mussell
Don Gregoire
Edwin Lyman
Eric Sezgen
Floyd DesChamps
Fred Beranek
Fred Hughes
Guinevere Shaw
Hawkins DeFrance
Ian Miner
Jana Bergman
Jane Hotchkiss
Jay Brister
Jeffrey Merrifield
Joseph McCarthy
Kaci Studer
Karen Gibson
Kinsey Boehl
Kyle Walton
Laila El-Guebaly
Leigh Lloveras
Lisa Davies
Mark Paulson
Martin O'Neill
Masashi Shimada
Matt Hendrickson
Matthew Cloutier
Matthew Lipka
Megan Shober
Michael Hua
Mike O'Neill**
Naomi Miller
Neil Herman
Pascal Dumont
Patrick White
Phillip Peterson
R. David Edelman
RD Edelman
Rich Hawryluk
RJ Roux
Robert Florian
Sachin Desai
Sai Zhang
Saira Hashmi

EXTERNAL STAKEHOLDERS

Sally Forbes
Sam Wurzel
Sara Castegini
SC Salem
Scott Hsu
Scott Landry
Sidney Fowler
Stefanie Blum
Steven Dolley
Susana Reyes
Tim Bohm
Trent Bauserman
Tyler Ellis**

* List does not contain attendees who participated via a phone line or who did not provide first and last names.

** Presenter