



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

February 17, 2022

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

**SUBJECT: PRELIMINARY RULE LANGUAGE FOR 10 CFR PART 53, SUBPART F,
"REQUIREMENTS FOR OPERATIONS," INTERIM REPORT**

Dear Chairman Hanson:

During the 692nd meeting of the Advisory Committee on Reactor Safeguards (ACRS), February 2-4, 2022, we completed our review of the staff's preliminary rule language for the new Title 10 of the *Code of Federal Regulations* (10 CFR) Part 53, "Licensing and Regulation of Advanced Nuclear Reactors," Subpart F, "Requirements for Operations." Our Future Plant Designs Subcommittee also discussed this matter during meetings on January 14, 2021, November 18, 2021, and December 16, 2021. During these meetings, we had the benefit of the referenced documents, discussions with the NRC staff and input from other stakeholders.

CONCLUSIONS AND RECOMMENDATIONS

1. The staff is methodically working through the delicate balance of flexibility and predictability in regulations for operator staffing.
2. The staff should consider the suggestions identified in this letter to ensure the 10 CFR Part 53 approach yields equivalent safety to current regulatory approaches.
3. The staff should approach the concept of not having a Shift Technical Advisor (STA) by having the applicant justify why the STA is not needed rather than a blanket elimination of this position. This is particularly important for the expected wide application of first-of-a-kind technologies that may be licensed under this rule.
4. The concept of non-licensed, certified operators should not be pursued. Staff should focus on adapting the existing approach to the NRC operator licensing process to produce training, qualification, and licensing requirements based on the degree of safety reliance attributed to operator actions for the specific plant design. This should take advantage of inherent and passive safety features of the nuclear power plant.
5. Staff should develop guidance for judging the acceptability of limited scope simulators.

BACKGROUND

The NRC staff continues to prepare for regulating a new generation of advanced reactors. The efforts of the staff have now progressed to developing proposed rulemaking for licensing advanced reactors using a technology-inclusive, risk-informed, performance-based approach. The staff is presenting proposed draft language for 10 CFR Part 53 in sections and plans to transition to topical areas for clarity and focus. We have issued two previous reports (October 21, 2020, and May 30, 2021) on the progress of the 10 CFR Part 53 rulemaking. This interim letter report focuses on the sections of Subpart F detailing the staffing and training of operations personnel.

DISCUSSION

The draft rule language for Subpart F is maturing in its concepts and language. Several innovative regulatory concepts are being proposed to complement the broader risk-informed approach underlying 10 CFR Part 53 for new and advanced reactors. In this letter, we provide suggestions related to guidance the staff is developing to support Subpart F implementation. In addition, we discuss concerns related to the absence of the STA position, the use of non-licensed certified operators, and allowance for limited scope simulators.

There is value in the staff proposal for having an operations staffing plan submitted and approved during the application review. As staff proceeds in efforts to develop guidance and rule language, we offer the following suggestions regarding staffing plans:

- Develop staffing guidance to assure safe operation of a first-of-a-kind nuclear power plant (e.g., augmented staff for reactors with novel coolant, materials, or fuel).
- Consider the important organizational interfaces and training for support personnel, such as maintenance, security, and emergency preparedness.
- Require one NRC senior licensed management position with authority over the licensed operating staff to ensure there is an ultimate decision-maker for reactor operations and special nuclear material decisions under normal and adverse conditions.

The draft rule language is silent on the STA (or STA-type) position resulting in essentially a blanket elimination of the position. There may be a wide breadth of technological applications, some without any prior operating experience. Being silent on STA-level support on-shift is not prudent. Instead, we recommend that the burden be on the prospective applicant to establish, as part of its NRC approved staffing plan, justification (through performance-based and risk informed analysis, including demonstration with simulators) that proposed staffing is adequately qualified to fulfill the requisite technical functions for the specific nuclear technology used in the plant. Such analysis would need to demonstrate that staff numbers, education, and training requirements would be equivalent to having an STA on-shift.

A licensed reactor operator is an important element of defense-in-depth because the operator's competence and proficiency are independently verified by the NRC. Current operator training practices are performance-based and have evolved over many years of experience, both with inspection and in the long-accepted and highly effective process of training program accreditation through the Institute of Nuclear Power Operations' (INPO) National Academy for Nuclear Training.

The preliminary language has two separate regulatory paths for the development of an operations staff. One path provides for licensed operators and largely follows the requirements of 10 CFR Part 55. The second path proposes the use of a certified operator (CO) in lieu of an NRC licensed reactor operator (RO) or senior reactor operator (SRO). To be eligible for the proposed CO path, the applicant must justify that there are no operator actions required to maintain safety of the plant. The CO program assumes equivalently trained and proficient non-licensed operators at sites where, essentially, no operator action is credited to mitigate licensing basis events, including defense-in-depth actions. The provision for COs and RO/SROs is to be either/or, not both at the same site. The option for COs is a discrete path through the regulation separate from the licensed operator path. The CO language has the applicant propose, for staff approval, a qualification program, topical content, and requalification periodicity. The licensee then runs the entire CO program with no NRC formal involvement beyond the initial program approval and routine inspection oversight. This could produce a lack of consistency in training across licensees and a degradation in the proficiency and competence of the operating staff, leading to an adverse impact on nuclear plant safety.

We agree that the criteria used for justifying a CO in lieu of a licensed operator may be met by some new nuclear technologies. However, the minimum requirement that the NRC be the sole operator license-authority is sound and beneficial to ensure highly trained, accountable operating staff, especially for first-of-a-kind advanced reactor technologies. Rather than pursuing a CO program, the staff should focus their efforts on modifying the current performance-based licensing process to recognize the relevant inherent and passive safety features of the specific reactor plant design. For example, a performance-based approach would apply both staff and licensee training resources only on the most important aspects of operator training and examination. Attributes that may be deemed excessive or unnecessary for a certain reactor technology can be addressed through a graded licensing process as well. Importantly, unlike a CO, NRC-licensed operators of a commercial nuclear reactor power plant are explicitly free from conflicts of interest with their own companies regarding safety decisions.

The preliminary Subpart F language does not require a full scope simulator; however, it specifies the simulation facility must be adequate to conduct human factors engineering assessments and support operator training. This simulation facility must be approved by the NRC, ensuring it will have sufficient fidelity for its intended purpose. Staff should develop guidance for judging the acceptability of limited scope simulators.

In addition to the development of proposed rulemaking for Subpart F, the staff recognizes the need to update documents, such as NUREG-1220, "Training Review Criteria and Procedures," and Inspection Procedure 41500, "Training and Qualification Effectiveness." The staff indicated a working group has been formed to update these documents. To assist in this effort, we recommend staff explore the possibility of getting assistance from INPO to ensure these updates consider lessons learned through the National Academy for Nuclear Training accrediting experience.

SUMMARY

Although the preliminary language for operator and personnel qualifications has some innovative concepts that will enhance the advanced reactor licensing process, we have concerns about some of the proposed changes. Recommendations in this letter should help ensure proposed changes in operator training and qualification do not degrade nuclear power plant safety.

Sincerely,



Signed by Rempe, Joy
on 02/17/22

Joy L. Rempe
Chairman

REFERENCES

1. Advisory Committee on Reactor Safeguards, Letter to Chairman Svinicki, U.S. Nuclear Regulatory Commission, "10 CFR Part 53, Licensing and Regulation of Advanced Nuclear Reactors," October 21, 2020. (ML20295A647)
2. U.S. Nuclear Regulatory Commission, "Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors," SECY-19-0117, December 2, 2019. (ML18311A264)
3. U.S. Nuclear Regulatory Commission, "Staff Requirements – SECY-19-0117 – Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light- Water Reactors," SRM–SECY-19-0117, May 26, 2020. (ML20147A504)
4. U.S. Nuclear Regulatory Commission, "Rulemaking Plan on Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors," SECY-20-0032, April 13, 2020. (ML19340A056)
5. U.S. Nuclear Regulatory Commission, "Staff Requirements - Rulemaking Plan on Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors," SRM- SECY-20-0032, October 2, 2020. (ML20276A293)
6. U.S. Nuclear Regulatory Commission, "Preliminary Rule Language 10 CFR Part 53, 'Licensing and Regulation of Advanced Nuclear Reactors': Subpart B – 'Technology-Inclusive Safety Requirements,' and Subpart F, 'Facility Safety Operations,'" December 18, 2020. (ML20337A432)
7. U.S. Nuclear Regulatory Commission, "10 CFR Part 53 Subpart F Preliminary Proposed Rule Language Discussion Table," December 2020. (ML20349A267)
8. U.S. Nuclear Regulatory Commission, "10 CFR Part 53 Subpart F Preliminary Proposed Rule Language Discussion Table," October 2021. (ML21288A403)

9. Nuclear Energy Institute, Letter to NRC, Subject: "Industry's Concerns about NRC Proposed Approaches to Part 53, and Alternative Discussion Draft for the NRC's Rulemaking on Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors," February 11, 2021. (ML21042B889)
10. U.S. Nuclear Industry Council, comment 14 submitted to the rulemaking docket NRC-2019-0062 entitled, "U.S. Nuclear Industry Council (USNIC) suggested update to Part 53 NRC Preliminary Language, with Discussion," February 3, 2021. (ML21035A003)
11. American Nuclear Society, Letter to NRC, Subject: "American Nuclear Society (ANS) Comments on the Nuclear Regulatory Commission (NRC) Rulemaking for a Risk-Informed, Performance-Based, and Technology-Inclusive Regulatory Framework for Advanced Reactors (10 CFR Part 53)," March 3, 2021. (ML21063A107)
12. Framatome, Inc., Letter to NRC, Subject: "Endorsement of NEI Comments on NRC Proposed Approaches to Part 53, and Alternative Discussion Draft for the NRC's Rulemaking on, Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors," February 15, 2021. (ML21064A325)
13. Nuclear Energy Institute, "Comprehensive Industry Comments on the NRC's Rulemaking on, Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors," November 5, 2021 (ML21309A578)
14. U.S. Nuclear Regulatory Commission, "Training Review Criteria and Procedures," NUREG-1220, Revision 1, January 1993. (ML102571869)
15. U.S. Nuclear Regulatory Commission, "Training and Qualification Effectiveness," NRC Inspection Manual, Inspection Procedure 41500, June 1995.

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