



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 17, 2018

COMSECY-18-0016

MEMORANDUM TO:

Chairman Svinicki
Commissioner Baran
Commissioner Burns
Commissioner Caputo
Commissioner Wright

PLEASE RESPOND BY:
September 5, 2018

FROM:

Margaret M. Doane
Executive Director for Operations

A handwritten signature in blue ink that reads "Margaret M. Doane".

SUBJECT:

REQUEST COMMISSION APPROVAL TO USE THE DIRECT
FINAL RULE PROCESS TO REVISE THE TESTING AND
REPORTING REQUIREMENTS IN 10 CFR PART 50,
APPENDIX H, REACTOR VESSEL MATERIAL SURVEILLANCE
PROGRAM REQUIREMENTS (RIN 3150-AK07)

PURPOSE:

To request Commission approval for the U.S. Nuclear Regulatory Commission (NRC) staff to use the direct final rule process to revise the testing and reporting requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix H, "Reactor Vessel Material Surveillance Program Requirements," (Appendix H). The NRC staff has determined that the use of the direct final rule process is the most efficient approach to conduct this rulemaking because it reduces unnecessary regulatory burden and is cost-beneficial. In addition the rulemaking involves a non-safety-significant issue. This abbreviated process would minimize the use of agency resources and potentially allow the revised requirements to become effective sooner, thus providing licensees the benefit of the rule change sooner. Furthermore, this is a non-controversial rulemaking because it does not involve any significant policy or legal issues. Existing regulatory guidance would not be revised nor would new guidance be developed as part of this activity, because the existing guidance is sufficient. For these reasons, the NRC staff does not expect to receive significant adverse public comments that could result in withdrawal of the direct final rule. The regulatory basis would be made publicly available.

CONTACTS: On H. Yee, NRR/DMLR
301-415-1905

Stewart Schneider, NMSS/DRM
301-415-4123

BACKGROUND:

Appendix H to 10 CFR Part 50 requires light-water nuclear power reactor licensees to have a reactor vessel (RV) material surveillance program to monitor changes in the fracture toughness properties of the RV materials adjacent to the reactor core. Unless it can be shown that the end of design life neutron fluence is below certain criteria, the NRC requires licensees to implement a materials surveillance program that periodically tests irradiated material specimens that are located in test capsules in their RVs. The program evaluates changes in material fracture toughness and thereby assesses the integrity of the RV. For each capsule withdrawal, the test procedures and reporting requirements must meet the requirements of the American Society for Testing and Materials (ASTM) E 185-82, "Standard Recommended Practice for Conducting Surveillance Tests for Light-Water Cooled Reactor Vessels," to the extent practicable for the configuration of the specimens in the capsule. The design of the surveillance program and the withdrawal schedule must meet the requirements of the ASTM E 185 that is current on the issue date of the American Society of Mechanical Engineers Code to which the reactor vessel was purchased. Later editions of ASTM E 185, up to and including those editions through 1982, may be used. In sum, the surveillance program must comply with ASTM E 185, as modified by Appendix H to 10 CFR Part 50. The number, design, and location of these surveillance capsules within the RV are established during the design of the program before initial plant operation. Some reactor licensees have already completed the withdrawal and testing of their surveillance capsules to account for plant operation through 60 years.

Appendix H to 10 CFR Part 50 also specifies that the test results of each capsule withdrawn must be the subject of a summary technical report to be submitted within 1 year of the date of capsule withdrawal, unless an extension is granted by the Director, Office of Nuclear Reactor Regulation. The NRC uses the results from the surveillance program to assess licensee submittals related to pressure-temperature limits in accordance with 10 CFR Part 50, Appendix G, "Fracture Toughness Requirements," and to assess pressurized water reactor licensee's compliance with 10 CFR 50.61, "Fracture toughness requirements for protection against pressurized thermal shock events," or 10 CFR 50.61a, "Alternate fracture toughness requirements for protection against pressurized thermal shock events."

In COMSECY-14-0027, "Rulemaking to Revise Title 10, *Code of Federal Regulations*, Part 50, Appendix H, "Reactor Vessel Materials Surveillance Program Requirements," dated June 25, 2014 (NRC's Agencywide Documents Access and Management System (ADAMS) Accession No. ML14077A472), the NRC staff requested permission to initiate rulemaking to revise Appendix H to 10 CFR Part 50 to incorporate the latest ASTM standards. The NRC staff also proposed to reduce the regulatory burden on reactor licensees by: (1) eliminating the testing requirement on specimens that do not provide meaningful information to assess RV integrity, (2) changing the withdrawal schedule for the design of new surveillance programs, and (3) relaxing the reporting requirements for submitting test results to the NRC. Furthermore, the NRC staff proposed to address adjusting the existing program withdrawal schedules to accommodate license renewal periods by revising Appendix H to 10 CFR Part 50 or NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 2, issued December 2010. In the staff requirements memorandum (SRM) to COMSECY-14-0027, dated August 8, 2015 (ADAMS Accession No. ML14220A184), the Commission approved the staff's recommendations for revising Appendix H to 10 CFR Part 50 and directed the staff to proceed with the rulemaking.

DISCUSSION:

The development of a regulatory basis allows the NRC staff to evaluate the options to address the regulatory problem before the staff expends significant resources on the rulemaking process. The NRC staff has prepared the regulatory basis (ADAMS Accession No. ML18057A005; Enclosure 1) for the Appendix H to 10 CFR Part 50 rulemaking and presents the conclusions below for Commission consideration.

Incorporate the Latest American Society for Testing and Materials Standards

Consistent with COMSECY-14-0027, the NRC staff explored the possibility of incorporating by reference the latest editions of the ASTM standards (i.e., the 2016 editions) into Appendix H of 10 CFR Part 50. The NRC staff reviewed the requirements established in the ASTM standards and determined that they go beyond the current Appendix H to 10 CFR Part 50 requirements. Furthermore, the burden associated with implementing these ASTM standards would be significant without a corresponding benefit to public health and safety and the environment. For example, the ASTM standards require the inclusion and testing of additional surveillance capsules, RV materials from the beltline, and fracture toughness specimens from the limiting RV materials. These requirements exceed the NRC's current approved methodologies to adequately assess RV integrity. A minimum of 13 possible conditions on the use of these ASTM standards would have been necessary to offset this burden. Thus, the NRC staff is proposing that it is more effective and efficient to maintain the current ASTM standard while only revising the testing and reporting requirements, as discussed below. Also as discussed below, the NRC staff conducted a public meeting at which external stakeholders agreed with the staff's approach.

Testing Requirements

Appendix H to 10 CFR Part 50 requires RV surveillance programs to include Charpy impact specimens from welds, base metal, and the weld heat-affected zone materials and tensile specimens from welds and base metal materials. The NRC staff proposes to reduce the testing of some specimens and eliminate the testing of other specimens that do not provide meaningful information to assess RV integrity. This decision is based on substantial material data, knowledge, and experience attained through the many years of RV surveillance program implementation. Specifically, the requirements to test weld heat-affected zone specimens and examine thermal monitors would be eliminated. Also, the NRC staff proposes to reduce the number of tensile specimens that require testing and specify that testing correlation monitor material is optional. The proposed changes would reduce the burden to licensees for specimen testing, without having an adverse effect on public health and safety and the environment.

Withdrawal Schedule for New Surveillance Programs

In COMSECY-14-0027, the NRC staff proposed to evaluate changing the capsule withdrawal schedule for the design of surveillance programs in new plants with RVs that have not yet been procured. The NRC staff has further evaluated this issue and is proposing to no longer pursue this change, because the withdrawal schedule in ASTM E 185-82 is a recommendation. Therefore, applicants and licensees have the flexibility to propose an alternative withdrawal schedule under the current regulatory framework.

Reporting Requirements

Appendix H to 10 CFR Part 50 requires licensees to submit test results to the NRC no later than 1 year after capsule withdrawal. As stated in the 1983 rulemaking (48 FR 24008; May 27, 1983), the primary purposes of the requirement are timely reporting of test results and notification of any problems. At the time of the 1983 rulemaking, there was a limited amount of data from irradiated materials from which to estimate embrittlement trends of RVs at nuclear power plants; thus, making it crucial for timely reporting of test results. An extensive amount of embrittlement data now exists, and embrittlement mechanisms are well understood. The 1 year reporting requirement has become a hardship for some licensees because of the implementation of integrated surveillance programs (which require significant coordination among multiple licensees and hot-cell laboratories) and because capsules with higher neutron fluence levels may need longer periods of radioactive decay before capsule shipping and testing can be performed. As a result, licensees have been requesting an additional 6 months to submit reports. To reduce unnecessary regulatory burden on licensees to prepare these extension requests and for the NRC to review and approve these requests, the NRC staff is proposing to increase the reporting period from 1 year to 18 months. This change would not have an adverse effect on public health and safety and the environment.

License Renewal

In COMSECY-14-0027, the NRC staff proposed to address adjusting existing program withdrawal schedules to accommodate license renewal periods by revising Appendix H to 10 CFR Part 50 or NUREG-1801, Revision 2. The NRC staff assessed this issue and determined that NUREG-1801 and NUREG-2191, Volume 2, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report," issued July 2017, provided sufficient guidance and recommendations to licensees to obtain the necessary surveillance test data for assessing RV integrity for plant operation beyond the initial 40-year operating license. Based on this assessment, the NRC staff is proposing not to pursue revising Appendix H to 10 CFR Part 50 to cover the periods of initial license renewal or subsequent license renewals.

Public Engagement

Over the past 3 years, the NRC staff has engaged external stakeholders in a variety of public forums on the issues related to revising Appendix H to 10 CFR Part 50. The NRC staff held the most recent public meeting on June 1, 2017, to exchange information on the rulemaking scope, options for revising Appendix H to 10 CFR Part 50, and preliminary cost-benefit data. Stakeholders agreed with the NRC staff's preferred option to: (1) retain the ASTM E 185-82 requirements and (2) make limited revisions to Appendix H to 10 CFR Part 50 by eliminating certain testing requirements and extending the reporting period. They believed that this option is relatively simple and would maximize unnecessary regulatory burden reduction. A summary of this meeting is available in ADAMS (ADAMS Accession No. ML17173A081). Access to information pertaining to other public meetings is listed in the enclosed regulatory basis. The NRC staff considered the feedback provided at all of the public meetings as it developed the regulatory basis.

Rulemaking Process

In developing the regulatory basis, the NRC staff prepared an analysis that assessed the costs and benefits of the rulemaking options to revise the regulations addressed above in Appendix H

to 10 CFR Part 50. The NRC staff assessed two options: (1) a standard notice-and-comment rule process and (2) a direct final rule process.

Standard Notice-and-Comment Rule Process. The analysis showed that this process would be slightly cost-beneficial because the cost to conduct rulemaking is approximately equal to the benefits afforded to the NRC and licensees because it would eliminate certain tests and extend the reporting period. Across the operating fleet, approximately 31 surveillance capsules remain to be withdrawn for testing, which accounts for plant operation to 60-years. During the rulemaking process, licensees would continue to withdraw and test capsules from the RV. Thus, the longer it would take to complete the rulemaking process, the associated costs would increase and the number of capsules already withdrawn would increase, which would further reduce the benefit provided from this rulemaking effort for a non-safety-significant issue.

Direct Final Rule Process. The analysis showed that this process would result in a rulemaking that has a greater net benefit to the NRC and licensees. The reason for this is two-fold: (1) the NRC would use fewer resources to conduct a direct final rule, because the time to complete the rulemaking is shorter than the standard notice-and-comment rule process; and, as a result, (2) once the rule is effective, there would be more averted testing costs, which gives licensees the greatest benefit.

For this rulemaking, the NRC would not impose any backfits, revise any existing regulatory guidance, or develop any new guidance. The guidance needed to implement the requirements in Appendix H to 10 CFR Part 50 is provided in ASTM E 185-82; NUREG-1801; and NUREG-2191, Volume 2. Furthermore, because this is a non-controversial rulemaking that does not involve any significant policy or legal issues and recent public feedback is supportive of the NRC staff's position, the staff does not expect to receive any significant adverse public comments that would result in withdrawing the direct final rule. Consequently, the NRC staff is proposing that the direct final rule process is the most efficient approach to revise Appendix H to 10 CFR Part 50.

Cost-Benefit Evaluation

The estimated undiscounted savings of proceeding with this rulemaking by the standard notice-and-comment rule process is \$465,419. The net present value translates to a cost of \$41,188 for a 7-percent discount rate and \$234,341 at a 3-percent discount rate. Alternatively, for the direct final rule process, the undiscounted savings is \$725,299, and the net present value translates to a savings of \$256,288 for a 7-percent discount rate and \$473,779 at a 3-percent discount rate. Both the standard notice-and-comment rule process and direct final rule process options reduce the burden on industry. The industry and NRC benefits estimated for the direct final rule process are greater than those for the standard notice-and-comment rule. This is partially because the direct final rule would become effective in 2020, two years sooner than for the standard notice-and-comment rule. The direct final rule process is preferred because the difference in benefits (undiscounted) between the direct final rule process and standard notice-and-comment rule process is a savings of \$259,881.

CONCLUSION:

The NRC staff concludes that the desired outcome of the regulatory basis, i.e., providing a persuasive argument for going forward with the rulemaking, has been achieved without the need to expend additional time and staff resources to issue the regulatory basis for public comment and conduct a standard notice-and-comment rule. Although staff does not anticipate

receiving any public comments that are significant and adverse, the NRC's rulemaking process for this action will provide the public an opportunity to comment on the direct final rule. In reaching this conclusion, the NRC staff considered recent stakeholder feedback and the implementation of process improvements to minimize resources to conduct a rulemaking. Secondly, for the reasons presented above, the NRC staff also proposes to reduce the regulatory burden on reactor licensees by using the direct final rule process to revise the testing and reporting requirements in Appendix H to 10 CFR Part 50. Lastly, the NRC staff intends to hold a public meeting to inform external stakeholders of the change in the rulemaking process, if the Commission approves going forward with a direct final rule.

RECOMMENDATIONS:

The NRC staff requests that the Commission approve the following:

- Use the direct final rule process to revise the testing and reporting requirements in Appendix H to 10 CFR Part 50, as proposed above.
- Publish the *Federal Register* notice in Enclosure 2, which makes the regulatory basis publicly available without an opportunity for public comment.
- Close the following tickets:
 - SRM-CMSY14-0027-1, "Issue [final] Regulatory Basis Document for the Rulemaking for 10 CFR Part 50, Appendix H, 'Reactor Vessel Material Surveillance Program Requirements.'" The regulatory basis is provided as Enclosure 1.
 - SRM-CMSY14-0027-2, "Provide CA Note to the Commission Regarding the Regulatory Basis Document for the Rulemaking for 10 CFR Part 50, Appendix H, 'Reactor Vessel Material Surveillance Program Requirements.'" This COMSECY supersedes the need for the Commissioner Assistant's note.
 - SRM-CMSY14-0027-4, "Issue Draft Regulatory Guidance for 10 CFR Part 50, Appendix H, 'Reactor Vessel Material Surveillance Program Requirements.'" The revision or development of regulatory guidance is not necessary, as the existing guidance remains sufficient.
 - SRM-CMSY14-0027-6, "Issue Final Regulatory Guidance for 10 CFR Part 50, Appendix H, 'Reactor Vessel Material Surveillance Program Requirements.'" The revision or development of regulatory guidance is not necessary, as the existing guidance remains sufficient.
- Close the following tickets for the proposed and final rule if the Commission approves the NRC staff's proposal, and then open a new ticket for the direct final rule.
 - SRM-CMSY14-0027-3, "Provide Proposed Rule for Part 50, Appendix H, Reactor Vessel Material Surveillance Program Requirements."
 - SRM-CMSY14-0027-5, "Provide Final Rule for Part 50, Appendix H, Reactor Vessel Material Surveillance Program Requirements."

RESOURCES:

This rulemaking is designated as a medium-priority rulemaking with Commission direction in accordance with the Common Prioritization of Rulemaking (CPR). Resources for the proposed and final rule are currently budgeted in the Operating Reactors business line for fiscal year (FY) 2018 and FY 2019. Resources beyond FY 2019 will be addressed through the planning, budget, and performance management process. The NRC staff will prioritize these activities in a manner consistent with the current CPR process and other priorities in the Operating Reactors business line.

COORDINATION:

The Office of the General Counsel has reviewed this memorandum and has no legal objections. The Office of the Chief Financial Officer has reviewed this memorandum for resource implications and has no objection.

SECY, please track.

Enclosures:

1. Regulatory Basis
2. *Federal Register* Notice

cc: SECY
OGC
OCA
OPA
CFO

**FRN: REACTOR VESSEL MATERIAL SURVEILLANCE PROGRAM
DATED:**

DISTRIBUTION:

PUBLIC	RidsNmssOd	MKhanna, NMSS
RidsEdoMailCenter	GWilson, NRR	GLappert, NMSS
RidsOgcMailCenter	MGavrilas, NRR	SSchneider, NMSS
RidsNrrOd	BThomas, RES	JShepherd, NMSS
RidsResOd	MMitchell, NRO	FSchofer, NMSS
RidsNroOd	MKirk, RES	AGomez, NMSS
RidsResDe	DRudland, NRR	IBerrios, NMSS
RidsNrrDss	OYee, NRR	TBarczy, OGC
RidsNrrDmlr	CFairbanks, NRR	DRoth, OGC
RidsNroDeia	AHiser, NRR	TCampbell, OGC
RidsResDe	SKrepel, NRR	DWidrevitz, NRO

ADAMS Accession Numbers: PKG: ML18057A000; COMSECY: ML18057A002; Regulatory Basis: ML18057A005; FRN: ML18057A003. WITS: SRM-CMSY140027-1 * via e-mail

OFFICE	NMSS/DRM/RRPB/PM	NMSS/DRM/RRPB/RS	NMSS/DRM/RASB/TL*	NMSS/DRM/RRPB/BC
NAME	SSchneider	GLappert	JShepherd	MKhanna
DATE	02/22/2018	02/28/2018	03/13/2018	03/20/2018
OFFICE	NMSS/DRM/D	RES/DE/D	NRR/DSS/D*	NRR/DMLR/D*
NAME	PHolahan	BThomas	MGavrilas (VCusumano for)	GWilson
DATE	04/18/18	05/01/2018	05/04/2018	04/30/2018
OFFICE	NRO/DEI/D*	RES/D*	NRO/D*	OGC – NLO* Contingent on rectification of "legal" comments
NAME	FAkstulewicz	MWeber (BThomas for)	FBrown	TBarczy
DATE	04/27/2018	05/16/2018	05/10/2018	06/01/2018
OFFICE	NMSS/DRM/RASB/BC *	NRR/D	EDO <i>Max Gut Down</i>	
NAME	CBladey (JShepherd- Vladimir for)	BHolian <i>Soft Meets</i>	VMcCree <i>8/17/18</i>	
DATE	05/07/2018	<i>6/22/18</i>		

OFFICIAL RECORD COPY