U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

10 CFR 50 Appendix H Rulemaking Activities

Public Meeting

January 19, 2016

Public Meeting Goals

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Provide overview of rulemaking activities for 10 CFR 50, Appendix H, Reactor Vessel Material Surveillance Program Requirements
- Discuss current staff considerations on update of Appendix H requirements
- Discuss rulemaking schedule
- Solicit stakeholder feedback

Background and the Rulemaking Process

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- SECY-14-0027- Commission direction to bifurcate Appendix G and Appendix H rulemaking activities
- Draft regulatory basis: publish for comment (4/2016)
- Publish final regulatory basis (9/2017)
- Proposed rule: publish for comment (includes draft regulatory guide) (10/2017)
- Final rule (includes regulatory guide) (1/2019)

Staff Considerations for Revising Appendix H

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- Revise incorporation by reference
  - ASTM E-185-15
    - Design of a surveillance program
    - Only applies to new plants
  - ASTM E-2215-15
    - Conduct of a surveillance program
    - No intent to change existing requirements
- Incorporation of ASTM standards into 10 CFR 50.55a, “Codes and Standards”

Staff Considerations for Revising Appendix H

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- Eliminate “beltline” term to clarify the materials that need to be monitored

  Possible text:

  B. Reactor vessels that do not meet the conditions of paragraph III.A of this appendix must have all ferritic materials that are predicted to exceed a neutron fluence of 10^{17} n/cm^2 (E>1 MeV) during the license period monitored by a surveillance program that contains a subset of those materials and complies with ASTM E 185 and ASTM E 2215, as modified by this appendix.

Staff Considerations for Revising Appendix H

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- HAZ testing requirement changes
  - ASTM E 2215-15 makes testing HAZ specimens optional

- Use broken specimens to generate data without requiring prior authorization
  - Has there been need to request authorization?

Proposed Text: III.B…
After testing, use of broken specimens to generate additional embrittlement data (for example, by re-constitution or metallurgical analysis) is permitted.

Staff Considerations for Revising Appendix H

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- Lengthen reporting requirements from 12 months to 18 or 24 months
  - Interested in feedback on benefits or drawbacks to 18 versus 24
  - Implications for pressure-temperature limit impact and sharing data for integrated programs to be prompt
- Clarifications to ASTM standards to be addressed in Regulatory Guide
  - Use of Regulatory Guide 1.190 for fluence determination versus secondary references in ASTM Standards
    - Consistent with current practice
    - Others under consideration
- Secondary reference treatment being evaluated
  - e.g. ASTM E 900, ASTM E 853, ASTM E 693

Staff Considerations for Revising Appendix H

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- Section 9.8 of ASTM E 2215-15 creates a requirement for implementing a dosimetry program if all capsules have been withdrawn

  If no surveillance capsules remain in the reactor, the uncertainty in the fluence projections could become unacceptably large. Therefore, some method must be used to periodically make dosimetry measurements to monitor radiation conditions.

  – Potentially an increase in requirements
  – Uncertainty in fluence projections is assessed by dosimetry benchmarks
    - Not necessarily caused by dosimetry benchmarks

Staff Considerations for Revising Appendix H

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ASTM E 185-15 does not define the number of capsules to be withdrawn during the license period

TABLE 1 Recommended Withdrawal Schedule

Sequence	Target Fluence	Notes
First	¼ MDF	Testing Required
Second	½ MDF	Testing Required
Third	¾ MDF	Testing Required
Fourth	MDF	Testing Required
Standby	< 2 MDF	Testing Not Required

3.1.11 *maximum design fluence (MDF)*—the maximum projected fluence at the inside surface of the ferritic pressure vessel at the end of design life

Design life is not specified

For a 160 design life only one capsule would be withdrawn during the first 40 years

NRC considering specifying withdrawal of a minimum of three capsules during first 40 years

Staff Considerations for Revising Appendix H

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- Other potential changes
  - Change Section IV.C to refer to pressure-temperature limits report rather than technical specifications
  - Still evaluating whether to address license renewal in Appendix H or in a companion regulatory guide.

Staff Considerations for Revising Appendix H

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- Potential to revise integrated program requirements for simplification only

Original Text:

III.C.1.e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

III.C.2. No reduction in the requirements for number of materials to be irradiated, specimen types, or number of specimens per reactor is permitted.

Proposed: Delete III.C.1.e and III.C.2

Path Forward

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- Regulatory Basis Phase
  - Draft will go out for public comment (**April 2016)**
  - Public meeting during comment period
- Proposed Rule Phase
  - Proposed rule out for 75-day public comment period
  - Public Meeting during comment period
  - Draft regulatory guide out for comment with proposed rule **(October 2017)**
- Final Rule Phase
  - Regulatory guide issued with final rule

    (January 2019)

Stakeholder Feedback

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- Are the provisions being considered by NRC likely to increase cost or decrease costs? If so, how much?
- Are the provisions being considered by NRC likely to result in decrease or increase in the number of submittals to the NRC? Is so, what kind and approximately how many per reactor per ten years?
- Are the provisions being considered by NRC adequate to address surveillance programs for future reactors?
- Are there other considerations NRC should be aware of?

NRC Contacts:

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