

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 50 and 52

[NRC-2022-0215]

Interim Staff Guidance: Material Compatibility for non-Light Water Reactors

AGENCY: Nuclear Regulatory Commission.

ACTION: Final guidance; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing Interim Staff Guidance (ISG) DANU-ISG-2023-01 “Material Compatibility for non-Light Water Reactors.” The purpose of this ISG is to assist the NRC staff in reviewing certain applications for construction and operation of non-light water reactor designs, including power and non-power reactors.

DATES: This guidance is effective on February 6, 2024.

ADDRESSES: Please refer to Docket ID **NRC-2022-0215** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2022-0215**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individuals listed in the “For Further Information Contact” section of this document.

- **NRC’s Agencywide Documents Access and Management System**

(ADAMS): You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the

search, select “Begin Web-based ADAMS Search.” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to PDR.Resource@nrc.gov. The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

- **NRC’s PDR:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Meg Audrain, telephone: 301-415-2133; email: Margaret.Audrain@nrc.gov and Rebecca Ober, telephone: 301-287-9299; email: Rebecca.Ober@nrc.gov. Both are staff of the Office of Nuclear Reactor Regulation at the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

I. Background

As part of its review of non-light-water reactor applications, the NRC determines whether materials proposed to be used will allow components to fulfill design requirements for the design life, or that adequate surveillance and monitoring programs are in place. The NRC regulations in part 50 and part 52 of title 10 of the *Code of Federal Regulations* (10 CFR) include requirements for material qualification and performance monitoring. The NRC endorsed American Society of Mechanical Engineers (ASME) Code Section III, Division 5, “High Temperature Reactors” (Section III-5), with conditions, in Revision 2 of Regulatory Guide 1.87, “Acceptability of ASME Code,

Section III, Division 5, ‘High Temperature Reactors,’” (ADAMS Accession No. ML22101A263).

II. Discussion

The purpose of this ISG, “Material Compatibility for non-Light Water Reactors, DANU-ISG-2023-01” (ADAMS Accession No. ML23188A178), is to aid the NRC staff reviewing non-light-water reactor applications for a construction permit or operating license under 10 CFR part 50 or for a design certification, combined license, standard design approval, or manufacturing license under 10 CFR part 52 that propose to use materials allowed under Section III-5. Section III-5 specifies the mechanical properties and allowable stresses to be used for design of components in high temperature reactors. Because Section III-5 states that it does not provide methods to evaluate deterioration that may occur in service as a result of corrosion, mass transfer phenomena, radiation effects, or other material instabilities, this ISG identifies information that the NRC staff should consider as part of its review of a non-light-water reactor application to review applicable design requirements, including qualification and monitoring programs for safety-significant structures, systems, and components.

III. Additional Information

Draft DANU-ISG-2023-01 “Material Compatibility for non-Light Water Reactors” was published in the *Federal Register* for public comment on March 7, 2023, (88 FR 14186) with a 60-day comment period. The NRC received fifteen public comments from private citizens and industry organizations. The NRC staff’s evaluation and resolution of the public comments are documented in Appendix A to the ISG in ADAMS under Accession No. ML23188A178.

IV. Congressional Review Act

DANU-ISG-2023-01 “Material Compatibility for non-Light Water Reactors” is a

rule as defined in the Congressional Review Act (5 U.S.C. 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

Dated: January 31, 2024.

For the Nuclear Regulatory Commission.

/RA/

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