



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

October 4, 2024

Mr. Chanson Yang
Radiant Industries, Inc.
1921 Maple St.
El Segundo, CA 90245

SUBJECT: RADIANT INDUSTRIES, INC. - U.S. NUCLEAR REGULATORY
COMMISSION'S FEEDBACK REGARDING TITLE 10 OF THE *CODE OF
FEDERAL REGULATIONS* PART 70, "DOMESTIC LICENSING OF SPECIAL
NUCLEAR MATERIAL" GAP ANALYSIS WHITE PAPER
(EPID NO. L-2024-LRO0026/CAC 000431)

Dear Mr. Yang:

By submission dated April 4, 2024 (Agencywide Documents Access and Management System Accession No. ML24115A321), Radiant Industries, Inc. (Radiant), submitted for the U.S. Nuclear Regulatory Commission (NRC) staff's review, white paper DOC-0B1A, "10 CFR 70 Gap Analysis." This white paper describes a gap analysis of Title 10 of the *Code of Federal Regulation* (10 CFR) part 70, "Domestic Licensing of Special Nuclear Material" against the specific requirements necessary to license a manufacturing facility capable of constructing and testing Radiant's Kaleidos reactor design. The NRC staff was asked to perform a review of this paper and provide feedback regarding the gap analysis. The NRC staff completed its review of the submittal and is generally aligned with its overall approach. However, the NRC staff noted that Radiant may want to reconsider its approach to a few sections. The enclosure to this letter provides the NRC staff's detailed observations for Radiant to consider.

If you have questions regarding this matter, please contact Kevin Roche at (301) 415-1554 or via email at Kevin.Roche@nrc.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen Philpott", is located above the typed name.

Signed by Philpott, Stephen
on 10/04/24

Stephen S. Philpott, Chief (Acting)
Advanced Reactor Licensing Branch 2
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Project No.: 99902106

Enclosure:
As stated

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**RADIANT INDUSTRIES, INC. - U.S. NUCLEAR REGULATORY COMMISSION'S FEEDBACK
REGARDING RADIANT WHITE PAPER: "10 CFR 70 GAP ANALYSIS WHITE PAPER,"
(L-2024-LRO-0026/CAC 000431)**

SPONSOR INFORMATION

Sponsor: Mr. Chanson Yang

Sponsor Address: Radiant Industries, Inc.
1921 Maple St.
El Segundo, CA 90245

Docket /Project No(s): 99902106/L-2024-LRO-0026/CAC 000431

DOCUMENT INFORMATION

Submittal Date: April 24, 2024

Submittal Agencywide Documents Access and Management System (ADAMS) Accession No.: ML24115A321

Purpose of the White Paper: Radiant Industries, Inc., (Radiant) stated that the purpose of this white paper is to document its gap analysis of Title 10 of the *Code of Federal Regulations* (10 CFR), part 70, "Domestic Licensing of Special Nuclear Material," against the requirements necessary to license a manufacturing facility that can perform online testing of its Kaleidos reactor.

Action Requested: Radiant requested the U.S. Nuclear Regulatory Commission (NRC) staff's feedback and observations regarding the information discussed in "10 CFR 70 Gap Analysis."

FEEDBACK AND OBSERVATIONS

The feedback and observations regarding this white paper are preliminary and subject to change. The feedback and observations are not regulatory findings regarding any specific licensing matter and are not official agency positions.

General NRC Staff Observations

The NRC staff has reviewed the above referenced document and notes the following observations, organized by document section and specific provision from 10 CFR part 70.

Enclosure

Section 4.4 - 10 CFR Part 70, Subpart D, "License Applications"

Regulation 10 CFR 70.22(b), "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." NRC Regulatory Guide (RG) 1.206, "Applications for Nuclear Power Plants," Revision 1 (<https://www.nrc.gov/docs/ML1813/ML18131A181.pdf>), pages 92-93, discusses that an applicant for a combined operating license (COL) may find it appropriate to request an exemption from the requirements in 10 CFR 70.22(b). Radiant would need to request an exemption from that specific regulatory requirement, if it determines an exemption would be appropriate.

Regulation 10 CFR 70.22(g)(1) - "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." Additional consideration may be needed for: (i) a description of the plan for physical protection of special nuclear material in transit; and (ii) a licensee safeguards contingency plan or response procedures, as appropriate. The NRC staff has the authority to inspect shipments to verify that the holder of a 10 CFR part 70 license complies with conditions in its license covering the transportation of special nuclear material (SNM). For example, if shipping is authorized to occur from a facility licensed under 10 CFR part 70, that NRC license includes a condition that references a specific document (either the physical security/protection plan or transportation security plan) and contains commitments for transportation security. In accordance with 10 CFR 70.42, "Transfer of special nuclear material," the 10 CFR part 70 licensee in possession of the SNM is responsible for its transfer. The NRC staff has the authority to inspect a 10 CFR part 70 licensee's compliance with its license condition and therefore may inspect the shipment, regardless of the carrier, to verify that the 10 CFR part 70 licensee fulfills its commitments related to transportation security, as well as the regulatory requirements for packaging and transportation in 10 CFR part 71, "Packaging and Transportation of Radioactive Material." The regulations in 10 CFR 70.32(b) state, "[t]he Commission may incorporate in any license such additional conditions and requirements with respect to the licensee's ownership, receipt, possession, use, and transfer of special nuclear material as it deems appropriate or necessary...." This provides the NRC staff with the authority to add conditions in a 10 CFR part 70 license that authorizes the transport of fuel loaded in a manufactured reactor that the NRC staff finds necessary for the specific case of transportation of a fueled reactor. In accordance with 10 CFR 70.32(b)(5), this could include conditions necessary to "[r]equire such reports and the keeping of such records, and to provide for such inspections, of activities under the license as may be necessary or appropriate to effectuate the purposes of the act and regulations thereunder."

Regulation 10 CFR 70.22(g)(3) - "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." Given the potential applicability of 10 CFR 70.22(g)(1), additional consideration should be given to the retention of the referenced plans and/or procedures, as appropriate.

Regulation 10 CFR 70.22(i)(2) - "Compliance Rationale" may be better captured by citing the provisions of 10 CFR 70.22(i)(2)(ii), as applicable.

Regulation 10 CFR 70.22(k) - "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." A COL application in accordance with 10 CFR part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," does not explicitly meet the exception provided for the operation of a nuclear power reactor licensed pursuant to 10 CFR part 50, "Domestic Licensing of Production and Utilization Facilities." Radiant would need to request an exemption from the specific regulatory

requirement, if it determines that an exemption would be appropriate.

Regulation 10 CFR 70.24(b)(1) and (2) - "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." A COL application in accordance with 10 CFR part 52 does not explicitly meet the exceptions provided for the operation of a nuclear power reactor licensed pursuant to 10 CFR part 50. Radiant would need to request an exemption from the specific regulatory requirements, if it determines that an exemption would be appropriate.

Regulation 10 CFR 70.24(c) - "Compliance Type" may be better captured as "General Information" and further consideration may be needed for the "Compliance Rationale." A COL application in accordance with 10 CFR part 52 does not explicitly meet the exceptions provided for the operation of a nuclear power reactor licensed pursuant to 10 CFR part 50.

Section 4.5 - 10 CFR Part 70, Subpart E, "Licenses"

Regulation 10 CFR 70.32(c)(1) and (2) - "Compliance Type" may be better captured as "Action Required" and further consideration may be needed for the "Compliance Rationale." NRC Regulatory Guide 1.206, "Applications for Nuclear Power Plants" (pages 92-93) discusses that an applicant for a COL may find it appropriate to request an exemption from the requirements in 10 CFR 70.32(c). Radiant would need to request an exemption from that specific regulatory requirement, if it determines that an exemption would be appropriate.

Regulation 10 CFR 70.32(d) - "Compliance Type" may be better captured as "General Information" and further consideration may be needed for the "Compliance Rationale." See the observations provided by the NRC staff in section 4.4, "License Applications," for 10 CFR 70.22(g)(1).

Regulation 10 CFR 70.32(e) - "Compliance Type" may be better captured as "General Information," and further consideration may be needed for the "Compliance Rationale." The provisions of 10 CFR 70.22(k) are applicable to the possession of more than 10 kilograms (kg) of SNM and a COL application in accordance with 10 CFR part 52 does not explicitly meet the exception provided for the operation of a nuclear power reactor licensed pursuant to 10 CFR part 50.

Section 4.6 - 10 CFR Part 70, Subpart D, "Acquisition, Use and Transfer of Special Nuclear Material, Creditors' Rights"

Regulation 10 CFR 70.41, "Authorized use of special nuclear material" - "Compliance Rationale" should consider the requirement to "confine his possession and use of special nuclear material to the locations and purposes authorized in his license" and whether an amendment of the COL would be necessary prior to deployment.

Regulation 10 CFR 70.44 "Creditor regulations" - "Compliance Type" may be better captured as "General Information" and further consideration may be needed for the "Compliance Rationale." The relevance of the reference in the Radiant document to 10 CFR 70.59, "Effluent monitoring reporting requirements," is unclear to the NRC staff. The provisions regarding "Creditor regulations" should be considered.

Principal Contributor(s): James Downs, NMSS