



Title: **10 CFR 70 Gap Analysis**
Subject: **Radiant Document**
Number: **DOC-0B1A**
Revision: **0.4**
Author: **Melinda Graham**
Approved By: **Chanson Yang**
Approval Date: **2024-04-24**

REVISION LOG

Rev.	Change Summary
0.4	Initial Release

CONTENTS

1	Purpose	3
2	Evaluation Criteria.....	3
3	General Summary	4
4	Gap Analysis	5
4.1	Subpart A, General Provisions	5
4.2	Subpart B, Exemptions.....	5
4.3	Subpart C, General Licenses.....	5
4.4	Subpart D, License Applications.....	5
4.5	Subpart E, Licenses.....	8
4.6	Subpart F, Acquisition, Use and Transfer of Special Nuclear Material, Creditors' Rights.....	9
4.7	Subpart G, Special Nuclear Material Control, Records, Reports and Inspections	10
4.8	Subpart H, Additional Requirements for Certain Licensees Authorized To Possess a Critical Mass of Special Nuclear Material	11
4.9	Subpart I, Modification and Revocation of Licenses.....	11
4.10	Subpart J, Enforcement.....	11
4.11	Appendix A, Reportable Safety Events.....	11

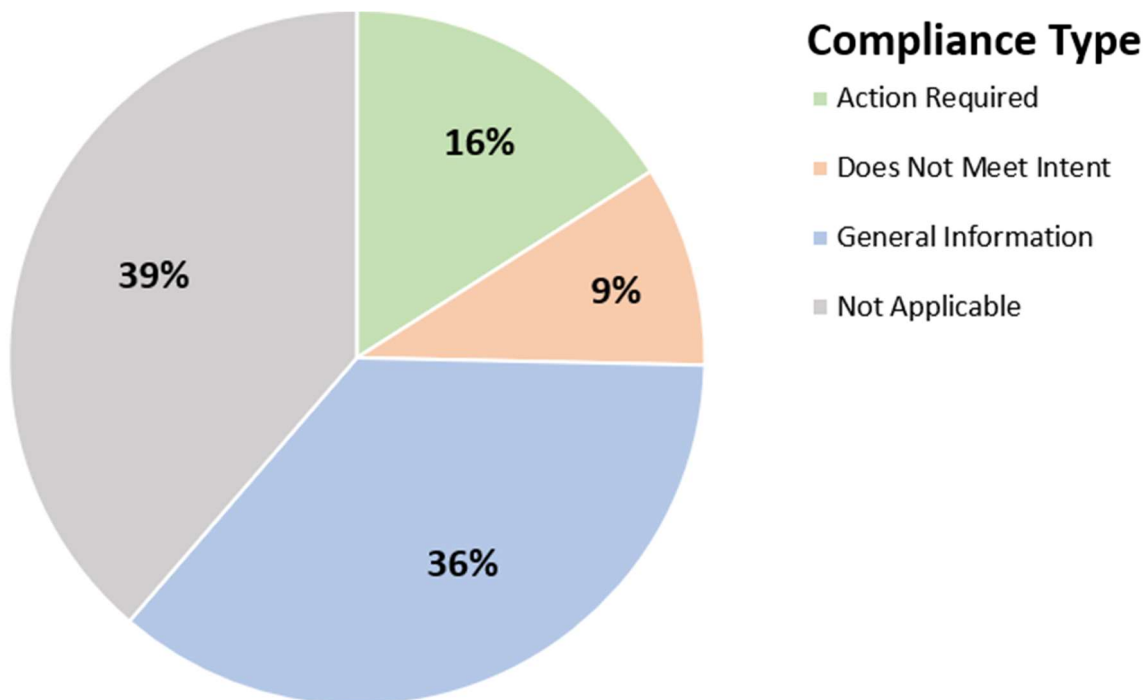
1 PURPOSE

This document is a gap analysis of 10 CFR 70, Domestic Licensing for Special Nuclear Material against the specific requirements necessary to license a manufacturing facility capable of online reactor testing for the Kaleidos reactor design. This gap analysis does not represent any specific commitment on Radiant's behalf; rather it is a document that will be used to inform the licensing framework necessary to license the Kaleidos reactor.

2 EVALUATION CRITERIA

The following evaluation criteria was utilized to categorize the sections and subsections of 10 CFR 70:

- **Action Required:** Items that need to be proven/verified/accounted for in the design and/or license application.
- **General Information:** Items associated with regulatory action or process, or represents general information that requires no specific action on Radiant's part.
- **Not Applicable:** Items that do not apply by nature of subpart or section applicability.
- **Does Not Meet Intent:** Items that may or may not apply, however is not supported by the code as written.



3 GENERAL SUMMARY

10 CFR 70 was evaluated with consideration for submittals and information provided in subsequent or simultaneous license application(s) consistent with 10 CFR 50 and/or 10 CFR 52. This gap analysis will support tracking identified requirements to implementation.

Information required for licensing a manufacturing facility and combined operating license may also be required to support a materials license application (e.g., Emergency Plan, Environmental Report). Items identified as “Not Applicable” throughout this gap analysis does not indicate that required information will not be provided; if information is required to support the regulatory framework established for licensing the Kaleidos reactor it will be supplied within some portion of the licensing process.

There were no items identified within 10 CFR 70 that require a specific exemption for licensing the Kaleidos manufacturing facility and/or reactor; this determination is subject to change and may be reflected in a revision to this document, or during submission of the eventual application.

There are a number of sections identified as not being required by nature of the reactor licensing process (“Does Not Meet Intent”). For these sections, an exemption for a reactor licensed under 10 CFR 50 was referenced, however it did not extend to reactors licensed under 10 CFR 52 with a combined operating license (COL). Per regulatory guide 1.206, Applications for Nuclear Power Plants, Section C.2.13, 10 CFR Parts 30, 40, and 70 Materials Licenses for Combined Licenses, it was recommended to submit an exemption request from the requirements in 70.22(b) and 70.32(c) that would allow the same regulations applied to nuclear power plants under 10 CFR 50 to be applied to those licensed as a COL under 10 CFR 52; “Prior COL applicants have requested and have been granted this type of exemption”. This same logic should follow for the exemptions referenced in 70.24.

The following sections of Part 70 were identified as falling into this category.

- 70.22, Contents of Applications
 - 70.22(b), Material Control and Accounting Program
- 70.24, Criticality Accident Requirements
 - 70.24(b)(1), Dose Identification
 - 70.24(b)(2), Decontamination Facilities
 - 70.24(c), Exemptions
- 70.32, Conditions of Licenses
 - 70.21(c)(1), Material Control and Accountability
 - Material Control Records

4 GAP ANALYSIS

4.1 Subpart A, General Provisions

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Subpart A, General Provisions	General Information	

4.2 Subpart B, Exemptions

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Subpart B, Exemptions	General Information	

4.3 Subpart C, General Licenses

Part 70 Subpart D		Compliance Type	Compliance Rationale
70.18	Types of Licenses	General Information	
70.19	General License for Calibration or Reference Sources	General Information	
70.20	General License to own Special Nuclear Material	General Information	
70.20(a)	General License to Possess Special Nuclear Material for Transport	Not Applicable	Will not possess formula quantities of strategic nuclear material.
70.20(b)	General License for Carriers of Transient Shipments...	Not Applicable	Will not possess "transient shipments" of SNM (refer to section 70.4 for definition of "transient shipment").

4.4 Subpart D, License Applications

Part 70 Subpart D	Compliance Type	Compliance Rationale
70.21 Filing	Action Required	
70.22 Contents of Applications		
(a) General Information	Action Required	
(b) Material Control and Accounting Program	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(c) Reserved	Not Applicable	
(d) Additional Statements	General Information	
(e) Complete and Accurate Disclosure	General Information	
(f) Plutonium Processing and Fuel Fabrication Plan	Not Applicable	Only applicable for plutonium processing and fuel fabrication facilities.
(g)(1) Transport Protection	Not Applicable	Transportation will be conducted by a licensed third party and is outside the scope of this license application.
(g)(2) Contents of Safeguards Contingency Plan	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(g)(3) Plan Retention	Not Applicable	Transportation will be conducted by a licensed third party and is outside the scope of this license application.
(h)(1) Physical Security Plan	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(h)(2) Physical Security Plan Retention	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(i)(1) Dose Consequence Evaluation or Emergency Plan	Action Required	
(i)(2) Dose Consequence Evaluation Factors	Not Applicable	Dose evaluation will not be submitted with the license application.
(i)(3) Content of Emergency Plans	Action Required	
(i)(4), Offsite Agency Review of Emergency Plans	Action Required	
(j)(1) Safeguards Contingency Plan	Not Applicable	Will not possess formula quantities of strategic special nuclear material.

Part 70 Subpart D	Compliance Type	Compliance Rationale
(j)(2) Content of Safeguards Contingency Plan	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(j)(3) Safeguards Contingency Plan Retention	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(k) Physical Security Plan	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(l) Protection of Safeguards Information (SGI)	Action Required	
(m) Theft Protection	Not Applicable	Only applicable for enrichment facilities.
(n) Liability Insurance	Not Applicable	Only applicable for enrichment facilities.
70.23 Requirements for Approval of Applications	General Information	
70.23a Hearing Required for Uranium Enrichment Facility	Not Applicable	
70.24 Criticality Accident Requirements		
(a) Criteria for Requiring a Criticality Alarm System	Action Required	
(a)(1) Monitoring System Requirements	Action Required	
(a)(2) Monitoring Systems Prior to 1974	Not Applicable	
(a)(3) Emergency Procedures	Action Required	
(b)(1) Dose Identification	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(b)(2) Decontamination Facilities	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(c) Exemptions	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.

Part 70 Subpart D	Compliance Type	Compliance Rationale
(d) Additional Exemptions	Not Applicable	Radiant will utilize 70.24; this section has no applicability.
70.25 Financial Assurance and Recordkeeping for Decommissioning	Not Applicable	Radiant will not utilize "unsealed" special nuclear material.

4.5 Subpart E, Licenses

Part 70 Subpart E	Compliance Type	Compliance Rationale
70.31 Issuance of Licenses	General Information	
70.32 Conditions of Licenses		
(a) Standard Conditions	General Information	
(b) Incorporations	General Information	
(c)(1) Material Control and Accountability	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(c)(2) Material Control Records	Does Not Meet Intent	Exemption for reactors licensed under Part 50, however is not inclusive of COL's licensed under Part 52 - Radiant should be exempted based on reactor licensing if pursuing a COL license.
(d) Changes to Transit Physical Protection Plan	Not Applicable	Transportation will be conducted by a licensed third party and is outside the scope of this license application.
(e) Changes to Security Plan	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(f) Reserved	Not Applicable	
(g) Safeguards Contingency Plan Procedures	Not Applicable	Will not possess formula quantities of strategic special nuclear material.
(h) Reserved	Not Applicable	
(i) Changes to Emergency Plan	Action Required	
(j) Protection of Safeguards Information	Action Required	

Part 70 Subpart E	Compliance Type	Compliance Rationale
(k) Uranium Enrichment Facility Inspection	Not Applicable	Only applicable for enrichment facilities.
70.33 Applications for Renewal of Licenses	General Information	
70.34 Amendment of Licenses	General Information	
70.35 Commission Action on Applications to Renew or Amend	General Information	
70.36 Inalienability of Licenses	General Information	
70.37 Disclaimer of Warranties	General Information	
70.38 Expiration and Termination of Licenses and Decommissioning of Sites and Separate Building or Outdoor Areas	General Information	
70.39 Specific Licenses for the Manufacture of Initial Transfer of Calibration or Reference Sources	Not Applicable	Not applicable for the Part 70 license application.
70.40 Ineligibility of Certain Applicants	General Information	

4.6 Subpart F, Acquisition, Use and Transfer of Special Nuclear Material, Creditors' Rights

Part 70 Subpart F	Compliance Type	Compliance Rationale
70.41 Authorized Use of Special Nuclear Material	General Information	
70.42 Transfer of Special Nuclear Material	General Information	
70.44 Creditor Regulations	Not Applicable	Per 70.59, this section is not required as it is not a processing, fuel fabrication, scrap recovery, conversion of uranium hexafluoride, or uranium enrichment facility.

4.7 Subpart G, Special Nuclear Material Control, Records, Reports and Inspections

Part 70 Subpart D	Compliance Type	Compliance Rationale
70.50 Reporting Requirements	Not Applicable	Per part 70.50(d), 70.50 does not apply if reporting under 50.72, which includes both Part 50 and Part 52 licensees (this should be the case); NOTE, an exemption may be required as 50.72 is specific to Part 50 licensees.
70.51 Records Requirements	General Information	
70.52 Reports of Accidental Criticality	General Information	
70.55 Inspections	General Information	
70.56 Tests	General Information	
70.59 Effluent Monitoring Reporting Requirements	General Information	

4.8 Subpart H, Additional Requirements for Certain Licensees Authorized To Possess a Critical Mass of Special Nuclear Material

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Subpart H, Additional Requirements for Certain Licensees Authorized To Possess a Critical Mass of Special Nuclear Material	Not Applicable	Per 70.60, section 70.61 through 70.76 (remainder of Subpart H) is not required unless the facility is engaged in enriched uranium processing, fabrication or uranium fuel or fuel assemblies, uranium enrichment, enriched uranium hexafluoride conversion, plutonium processing, fabrication of mixed-oxide fuel or fuel assemblies, scrap recovery, or any other activity the commission determines.

4.9 Subpart I, Modification and Revocation of Licenses

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Subpart I, Modification and Revocation of Licenses	General Information	

4.10 Subpart J, Enforcement

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Subpart J, Enforcement	General Information	

4.11 Appendix A, Reportable Safety Events

Part 70 Subpart/Section	Compliance Type	Compliance Rationale
Appendix A, Reportable Safety Events	Not Applicable	Per the applicability statement, this section only applies to licensees subject to the requirements in Subpart H.