

RHODE ISLAND ATOMIC ENERGY COMMISSION
RESEARCH REACTOR
LICENSE NO. R-95
DOCKET NO. 50-193

RESPONSES TO NRC STAFF REQUEST FOR
ADDITIONAL INFORMATION
FOR LICENSE RENEWAL REVIEW

REDACTED VERSION*

SECURITY-RELATED INFORMATION REMOVED

*REDACTED TEXT AND FIGURES BLACKED OUT OR DENOTED BY BRACKETS



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RHODE ISLAND ATOMIC ENERGY COMMISSION

Rhode Island Nuclear Science Center
16 Reactor Road
Narragansett, RI 02882-1165

Mr. William B. Kennedy, Project Manager
Research and Test Reactors Branch A
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

December 14, 2010

Re: Renewal of License No. R-95
Docket No. 50-193

Dear Mr. Kennedy:

We are responding to your requests for additional information (RAIs) regarding certain of our proposed technical specifications. We will first repeat the RAI and follow that with our response. The RAIs addressed in this letter are RAI NRC Numbers 4.1, 9.4, 13.6, 14.1, 14.65, 14.91, 14.102, and 14.125 from your letter dated April 13, 2010.

4.1 Figures 4-5, 4-6, 4-7, and 4-8 were omitted from the SAR. Provide these figures.

Response: The figures of Chapter 4, "Reactor Description", were incorrectly referenced throughout the chapter. The following table shows each reference, which page it is found on, the figure it references and the page they can be found, the corrected reference in an updated version of the SAR, and a description of the figure.

Original Text	Page	Original Figure	Page	Current Figure	Page	Description
4-1	4-3	4-1	4-25	4-1	4-4	14 Element Core
4-1	4-3	-	-	4-2	4-5	Core Assembly
5-3	4-6	5-3	5-11	4-3	4-9	Cutaway View of Flow Channels
4-1	4-7	4-4	4-28	4-4	4-11	Start-up to Equilibrium Cores
4-6	4-7	4-4	4-28	4-4	4-11	Start-up to Equilibrium Cores
4-6	4-8	4-4	4-28	4-4	4-11	Start-up to Equilibrium Cores
4-7	4-14	-	-			Hot Channel Fuel Surface Graph
4-8	4-16	-	-			LEU core Flow vs DP Graph
4-1	4-21	4-2	4-26	4-5	4-26	17 Element Core
4	4-21	4-1, 4-2	4-25, 4-26	4-1, 4-5	4-4, 4-26	14, 17 Element Cores
4-5	4-5	4-3	4-27	4-6	4-27	Power Peaking Factors in Thermal Hydraulic Calculations

AD20

The “Hot Channel Fuel Surface Graph” and “LEU Core Flow vs DP Graph” figures are part of the new analysis being performed by Argonne National Labs. See the updated analysis for this data. The “Power Peaking Factors in Thermal Hydraulic Calculations” figure is also outdated.

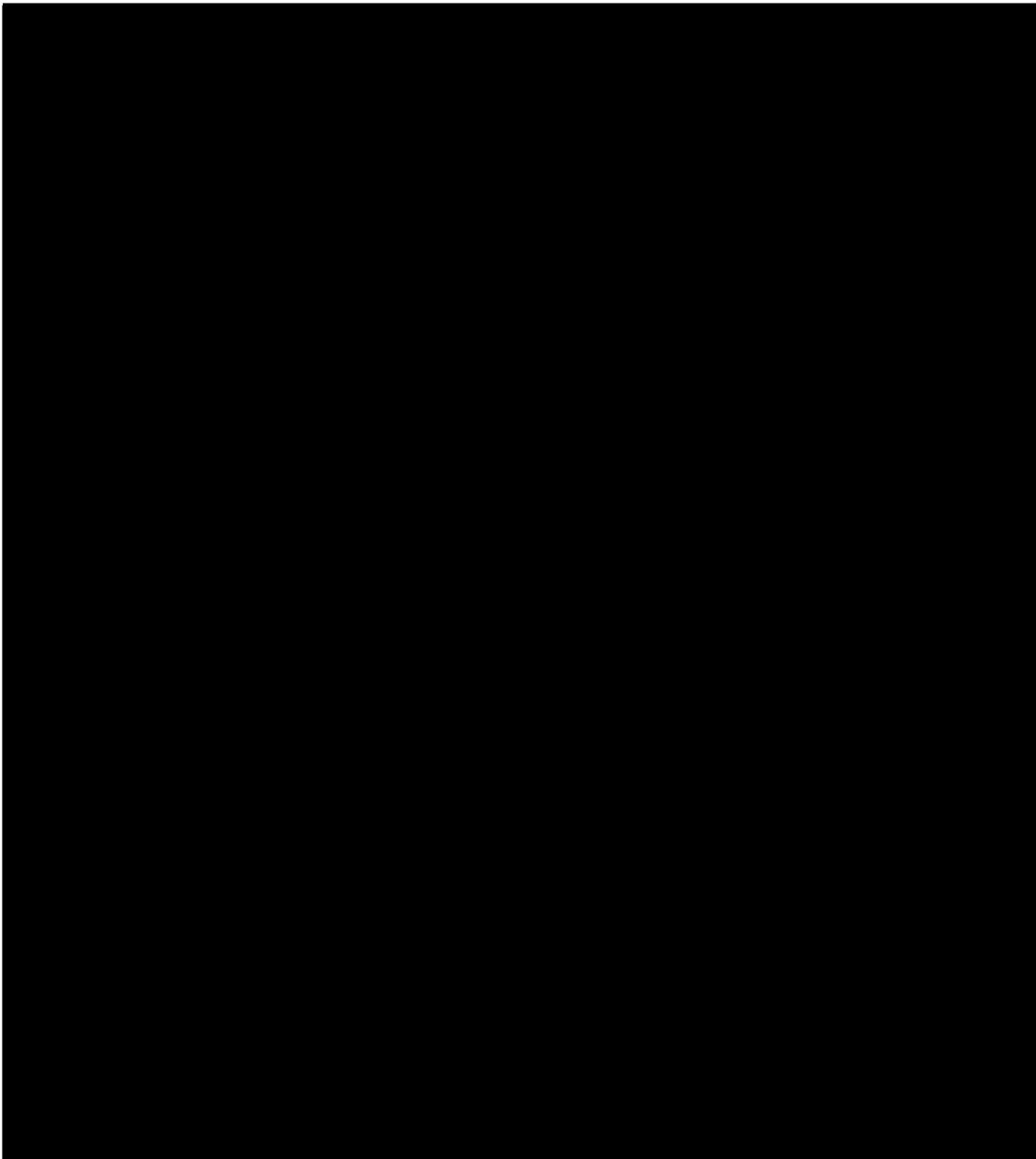


Figure 4-1

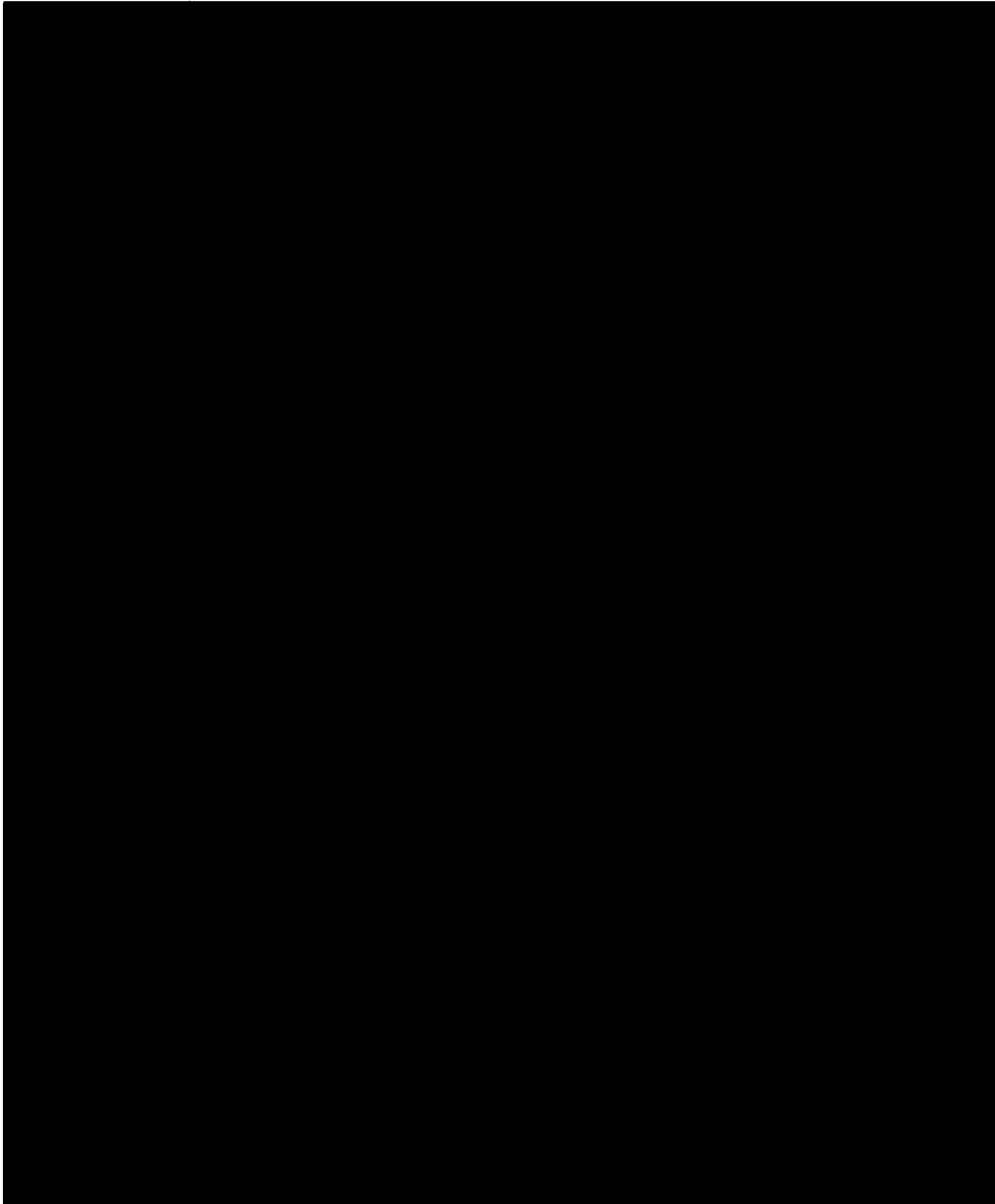


Figure 4-2

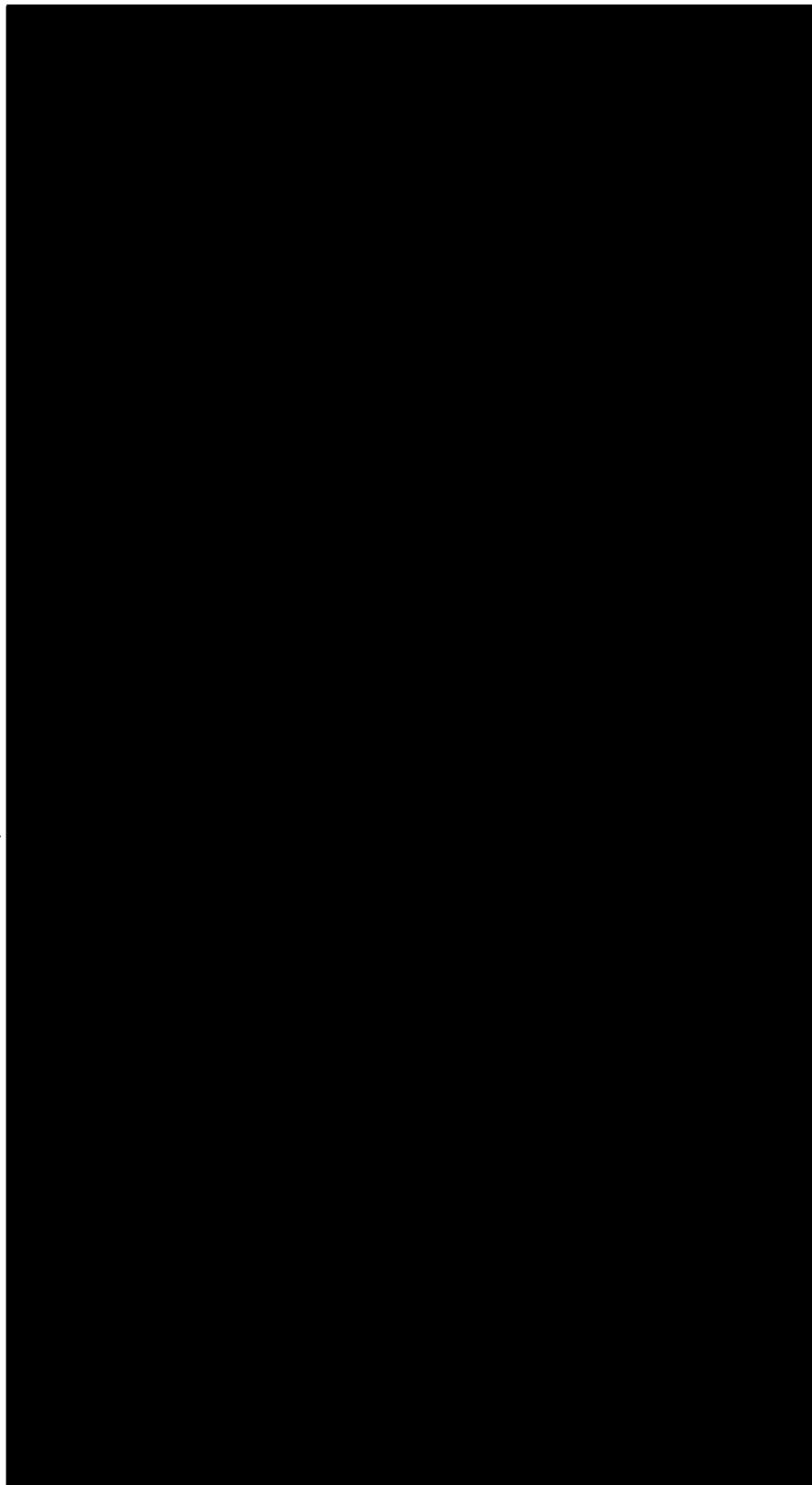


Figure 4-3

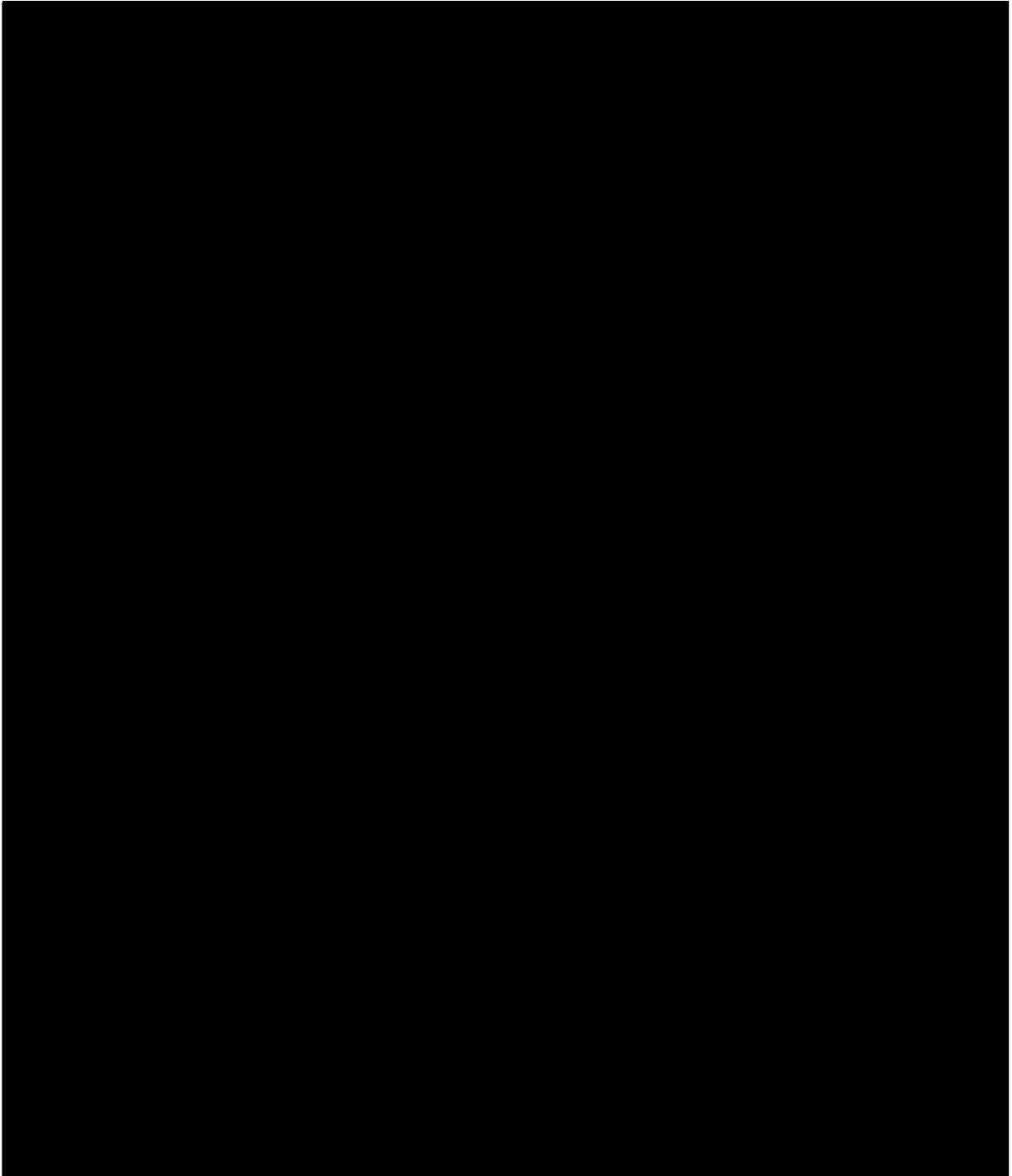


Figure 4-4

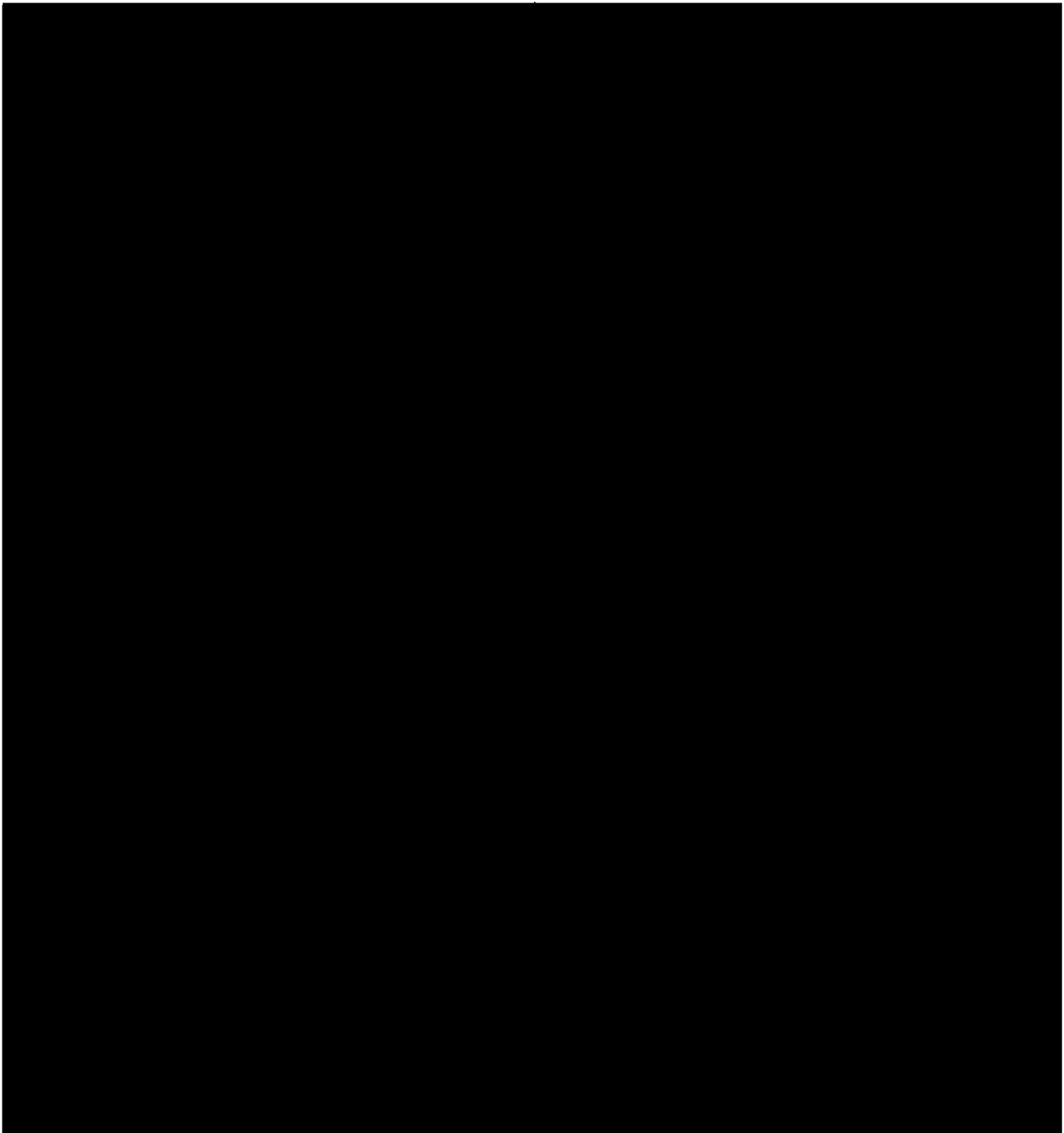


Figure 4-5

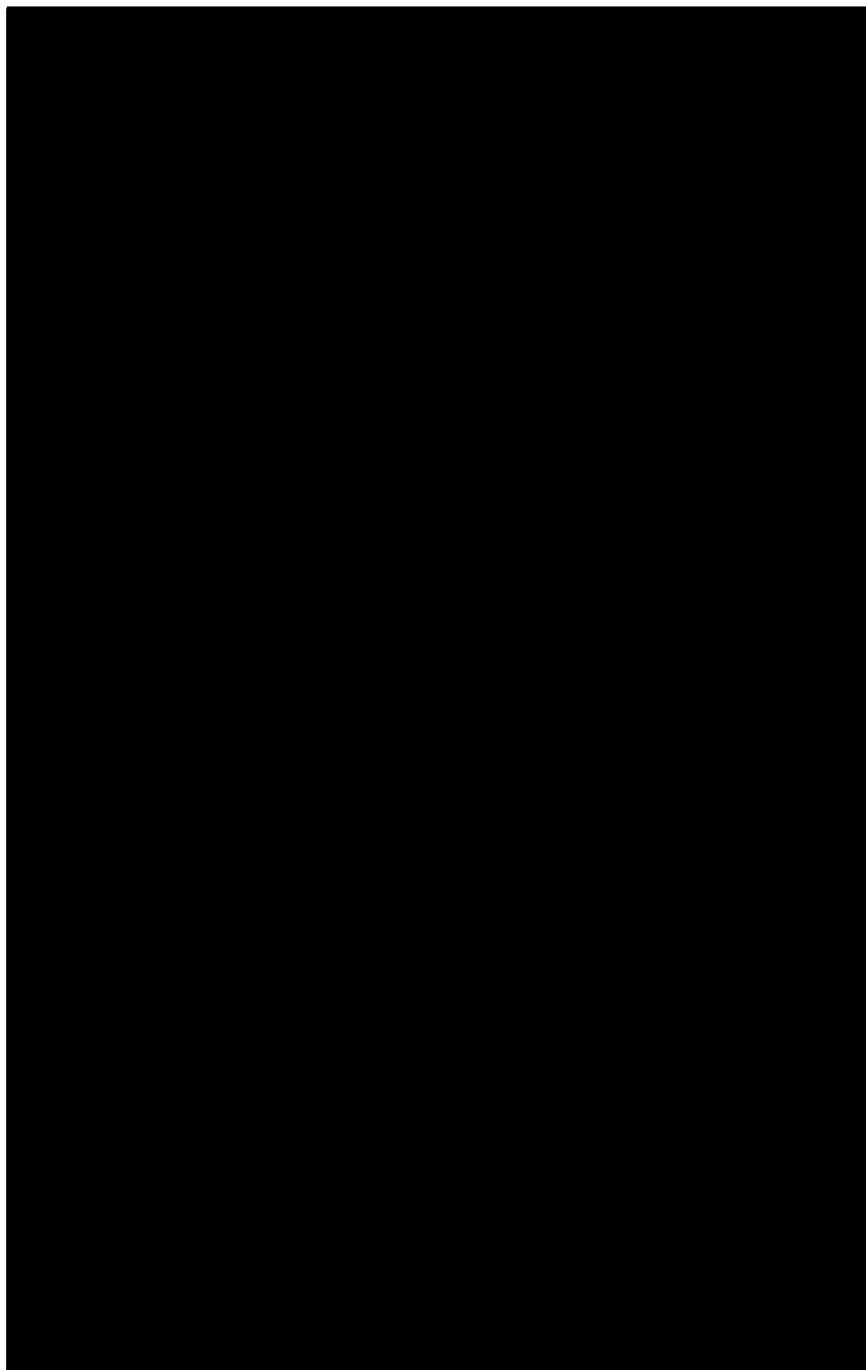


Figure 4-6

9.4 Provide a legible copy of Figure 9-7.

Response: Figure 9-7 was a schematic of the Bay Campus Water System. The original drawing is somewhat illegible. Consequently this figure will be removed from the SAR. We will reference the original drawing as needed.

- 13.6 Section 13.2.2 of the SAR references Figure 13.1, but the figure does not appear in the SAR. Provide a copy of this figure.

Response: ANL generated a new analysis for a 0.6 % dk/k reactivity insertion accident since total experiment worth is limited to this much excess reactivity. This section of the SAR will be re-written based on this analysis. See the response to RAI question 13.7. Figure 13.1 of the SAR references a graph of the core power and peak cladding temperature with time. This figure was not re-generated for the new analysis.

- 14.1 The proposed TS contain numerous references to a version of the SAR that is different than the version of the SAR submitted with the license renewal application (e.g., TS 4.2.6 references "SAR (Part A, Section V)"). Such references are included in TS 4.1.1.b, 4.2.6, 4.2.7, 4.2.8, 5.3, 5.5, and in the bases for TS 2.1.1, 2.2.1, 3.1, 3.2, 3.9.a, 4.9.a, and 4.9.b. Revise the proposed TS to refer to the SAR submitted with the license renewal application, as amended.

Response: The Rhode Island Nuclear Science Center Technical Specifications contain numerous referencing errors due to discrepancies between document versions. Below is a table of the sections in which these errors can be found, their page numbers as can be found in Chapter 14 of the SAR, the current reference, and the corrected referenced section. The Corrected SAR Reference column indicates where the information should have been located. In some cases, these sections of the SAR have been revised. Any information that has been moved or omitted will be addressed in the future.

TS Section	Page	Reference	Corrected SAR Reference
2.1.1	14-12	Part B	Sections 4.6-4.8
2.2.1	14-14	Part B	Section 13.2.3
2.2.1	14-14	Part A, Section XI	Section 13.2.5
2.2.1	14-14	Part A, Section IX and Part B Section X and Appendix D	Section 13.2.3
3.1	14-17	Part A, Section V	Section 4.5
3.2	14-18	Section XI	Section 4.5
3.9a	14-30	Part A Section VIII	Section 4.2.3
4.1.1b	14-32	Part A, Section V	Section 4.5
4.2.6	14-33	Part A, Section V	Section 4.5
4.2.7	14-34	Part A, Section V	Section 4.5
4.2.8	14-34	Part A, Section V	Section 4.5
4.9a	14-39	Part A, Section VIII	Section 4.2.3
4.9b	14-40	Part A, Section VI	Section 4.5
5.3	14-41	Figure 4, Revision 1, Section V, Dec. 1992	Figure 4-1, Chapter 4
5.5	14-42	Part A, Section XII	Section 9.2.3

- 14.2 The "Specification" section of several proposed TS contain references to portions of the SAR. Any portion of the SAR referenced in the "Specification" section of a proposed TS will become part of the TS and license. Unless it is intended that portions of the SAR become requirements of the TS and license, revise the "Specification" sections of the proposed TS to eliminate references to the SAR.

Response: This is a general comment. Specifications that contain references to portions of the SAR will be revised accordingly on a case by case basis.

- 14.65 TS 3.1.7 states, "Experiments which could increase reactivity by flooding, shall not remain in or adjacent to the core unless the shutdown margin required in Specification 3.1.1 would be satisfied after flooding." Explain why experiments that could reduce the shutdown margin below 1.0 %Ak/k by flooding would ever be allowed in or adjacent to the core, and revise the proposed TS as appropriate. (See RAI 4.14)

Response: Technical Specification 1.16 takes into consideration credible malfunction in the definition of the reactivity worth of experiments. See the answer to RAI question 14.17. Technical Specification 3.1.7 makes clear that flooding is a credible malfunction.

As discussed in the answer to RAI question 14.137, in order to determine the reactivity worth of a new experiment for which there is no data based on similar experiments, the only way to determine the reactivity worth of the experiment is to perform an approach to critical with the experiment loaded in the core. In that case, it is possible that an experiment could be found to have enough positive reactivity that if additional positive reactivity were added due to flooding, the shutdown margin would be less than 1.0 % dK/K. In that event, Technical Specification 3.1.7 requires that the experiment be removed immediately.

- 14.91 The "Applicability" section of TS 3.3.b includes cycles of chloride and resistivity. TS 3.3.b does not contain any specifications related to these parameters. Explain this apparent inconsistency, and revise the proposed TS as appropriate.

Response: The specification refers to secondary coolant water. There is no need for a technical specification dealing with either chlorides or resistivity in the secondary coolant water. SAR Section 5.1, "Summary Description," starting at line 7 states: "The RINSC reactor is an open pool type reactor that uses de-mineralized water for primary coolant, shielding, and reactor moderator; and city water for secondary coolant. SAR Section 5.3.2, "Secondary Coolant System Operation," states: "City water is used as secondary coolant for both loops." SAR Section 5.5.2, "Secondary Makeup Water System," states "City water supplies the makeup water to the secondary coolant system." Starting at line 32 of SAR Section 5.5.2, the description states: "Historically the blow-down interval has been set such that the pH of the secondary water has been maintained between 5.5 and 9.0, which has kept mineral buildup and corrosion to a minimum." Since city water is being used, the applicability section of the technical specification should be reworded to say: "This specification applies to limiting conditions for secondary coolant pH and

radioactivity.” Please remove the words, “cycles of chloride,” and “resistivity” from TS 3.3.b

14.102 The “Applicability” section of TS 3.7.1 mentions fuel movement and handling of radioactive materials in the reactor building, but the specification only specifies requirements for reactor operation. Explain why there are no requirements for radiation monitoring systems during fuel movement and handling of radioactive materials in the reactor building, and revise the proposed TS as appropriate.

Response: The facility radiation monitoring system is described in SAR Section 7.2.15 and summarized in Table 3.2 of the technical specifications. The radiation monitoring system is powered and “on” all of the time. Thus, it is unnecessary to have separate requirements for fuel movement or handling radioactive materials.

14.125 The third paragraph of TS 3.8.10 states, “Limits for maximum permissible concentrations are specified in the appropriate section of 10 CFR 20.” Revise the proposed TS to use current 10 CFR Part 20 terminology and to be more specific about the section of 10 CFR Part 20 that applies to TS 3.8.10.

Response: Please change the wording in TS 3.8.10 to read: “Limits for derived air concentrations for occupational exposure may be found in 10 CFR Part 20, Appendix B, Table 1, Column 3 and limits for derived air concentrations for airborne effluent releases may be found in 10 CFR Part 20, Appendix B, Table 2, Column 1.”

If you have questions regarding this letter, please address them to the undersigned.

Very truly yours,

Terrence Tehan Ph.D., Director
Rhode Island Atomic Energy Commission

I certify under penalty of perjury that the representations made above are true and correct.

Executed on: 12/14/2010

By: 