

July 5, 2007

Mr. Andrew Kauffman  
The Ohio State University  
Nuclear Reactor Laboratory  
1298 Kinnear Road  
Columbus, OH 43212-1154

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE OHIO STATE  
UNIVERSITY RESEARCH REACTOR APPLICATION FOR RE-LICENSING  
(TAC NO. MA7724)

Dear Mr. Kauffman:

We are continuing our review of your application for re-licensing of The Ohio State University research reactor dated December 15, 1999, as supplemented on August 21, 2002; August 18, 2005; July 26, 2006; May 15, 2007; and May 31, 2007. During our review of your application, as supplemented, we have determined that additional information is needed. Please provide responses to the enclosed request for additional information no later than 30 days from the date of this letter. Your timely response is needed to support completion of the review. In accordance with 10 CFR 50.30(b), your response must be executed in a signed original under oath or affirmation.

If you have any questions, please contact William B. Kennedy at 301-415-2784, or me at 301-415-1631.

Sincerely,

/RA/

Daniel E. Hughes, Project Manager  
Research and Test Reactors Branch A  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-150  
Enclosure: As stated  
cc w/enclosure: See next page

Ohio State University

Docket No. 50-150

cc:

Robert Owen, Chief  
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Ohio Department of Health  
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Test, Research, and Training  
Reactor Newsletter  
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REQUEST FOR ADDITIONAL INFORMATION  
OHIO STATE UNIVERSITY RESEARCH REACTOR  
DOCKET NO. 50-150

**Safety Analysis Report, Chapter 8**

Attachment B to the supplement to your application submitted August 21, 2002, provides an estimate of the direct radiation dose outside the reactor building following the maximum hypothetical accident (MHA). The calculated dose, based on a number of very conservative assumptions, exceeds the limits specified in Title 10, Code of Federal Regulations, Chapter 1 (10 CFR), Part 20 for members of the general public. It appears that your assumptions may be in error or overly conservative. If possible, refine your assumptions for the MHA such that the accident remains hypothetical but that the bounding maximum dose to a member of the general public meets the limits specified in 10 CFR Part 20. All assumptions should be justified in the revised analysis.

**Technical Specifications**

In accordance with 10 CFR 50.36, provide proposed Technical Specifications (TSs). The proposed TSs should be in conformance with ANSI/ANS-15.1-1990, "American National Standard for The Development of Technical Specifications for Research Reactors," as appropriate. The standard provides valuable guidance in the development of the TSs such that they meet the requirements of 10 CFR 50.36. Each individual change in the proposed TSs from the current TSs incorporated in Facility License No. R-75 (current TSs) should be cited.

Pursuant to 10 CFR 50.36(b), the technical specifications will be derived from the analyses and evaluation included in the safety analysis report (SAR). This may be accomplished by providing replacement SAR pages that contain the bases for the TSs or by providing, as part of your response, a separate analysis, discussion, and/or reference to applicable standards as basis justification of each substantive change. In the latter case, the staff will incorporate that response in the Safety Evaluation Report by reference. You may provide replacement pages for your SAR at a later time. In addition, each TS editorial change should be described in your response. Change citations and the accompanying justifications and descriptions should not appear in the proposed TSs. The proposed TSs shall be reviewed and approved by the Reactor Operations Committee in accordance with the Administrative Controls required by the current TSs.

Pursuant to 10 CFR 50.36(a), summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the proposed specifications, but shall not become part of the technical specifications.

Pursuant to 10 CFR 50.36(b), the Commission may include such additional TS as the Commission finds appropriate, and the approved TSs and any additional TSs will be incorporated into the renewed license.

The following is a list of specific sections of the proposed TSs submitted with your application December 15, 1999, that require clarification or additional information.

Enclosure

### **Section 1.3 Definitions**

- A. Only those definitions that are relevant to other sections of the proposed TSs or critical to analyses contained in the Safety Analysis Report (SAR) should be included in this section.
- B. Incorporate the relevant portions of the supplement to your application submitted August 21, 2002.
- C. Exclusion Area: The referenced regulation, 10 CFR 100.3, is only applicable to stationary power or testing reactors. Update or change the definition and reference to be applicable to a research reactor (e.g., *Controlled Area*, 10 CFR 20.1003).

### **Section 2.2 Limiting Safety System Settings**

- A. In accordance with 10 CFR 50.36(c)(1)(ii)(A), this proposed TS should contain settings for automatic protective devices. These settings should be supported by relevant analyses found in the SAR. The Bases for this proposed TS should reference these analyses.

#### **Section 3.1.1 Reactivity**

- A. (4) Clarify the type of fuel element that is referred to by “control fuel element,” as this is not defined in Section 1.3 of the proposed TSs.
- B. (5) Clarify the range of temperatures referred to by the phrase “all normal operating temperatures.”

#### **Section 3.2.1 Reactor Control and Safety System**

- A. Incorporate the relevant portions of the supplement to your application submitted August 21, 2002. Specifically, update the reference to the SAR found in the Bases for this proposed TS, and ensure consistency with Section 1.3 of the proposed TSs.

#### **Section 3.2.3 Minimum Number of Scram Channels**

- A. Incorporate the relevant portions of the supplement to your application submitted August 21, 2002. Specifically, ensure that scram terminology is consistent with Section 1.3 and other relevant sections of the proposed TSs.
- B. 4. Clarify which coolant system pumps are included in the “Function” portion of this proposed TS.
- C. 7.b. The proposed TS contains the switch “Effluent Monitor in counter in ‘Count’,” whereas the current TS contains the switch “Startup Cal-Use in ‘Use’.” Provide justification for this change.

- D. 11. The proposed TS contains a value of "4" under the heading "Minimum Required," whereas only 3 components are listed under the heading "Reactor Safety System Component." Provide clarification that there are only 3 components, or include the missing component and its function in this proposed TS.
- E. 11.c. The current TS contains the component "Linear Level" and the function "Servo deviation  $\leq$  Set point (nominal 10%)." The proposed TS contains a different component and function. Provide justification for this change.
- F. Bases, 11. The current TS contain the sentence, "Assures shutdown if servo operation varies too greatly." This sentence does not appear in the Bases for the proposed TS. Provide justification for this change.

### **Section 3.4 Confinement Isolation**

- A. Incorporate the relevant portions of the supplement to your application submitted August 21, 2002. Specifically, update the reference in the Bases for this proposed TS.

### **Section 3.6.2 Radioactive Effluents**

- A. (2) The proposed TS should use terminology consistent with 10 CFR 20, Appendix B, Table 2, or the term "Annual Average Concentration" should be defined in Section 1.3 of the proposed TSs. Update Objective (2) of this proposed TS accordingly.

### **Section 5.2.2 Secondary and Tertiary Coolant Loops**

- A. The current TS contains the sentence, "If the outside air temperature is  $\leq 78^{\circ}\text{F}$  then an outside fan-forced drycooler is sufficient to remove all heat generated at 500 kw." This sentence does not appear in the proposed TS. Provide justification for this change.

### **Section 5.2.3 Reactor Core and Fuel**

- A. The proposed TS increases the approximate number of standard fuel elements that may be utilized to achieve the proper excess reactivity from the current TS number. Provide justification for this change from the current TS.

### **Section 5.4 Fuel Storage**

- A. The current TS contains specifications (a), (b), and (c) regarding the fuel storage racks in the Bulk Shielding Facility storage pool. The proposed TS does not contain these specifications. Provide justification for this change.

### **Section 6.1.1 Structure**

- A. Incorporate the relevant portions of Amendment No. 18 to Facility License No. R-75, issued December 22, 2005, into Figure 6.1.

### **Section 6.1.3 Staffing**

- A. The proposed TS does not assure compliance with the requirement of 10 CFR 50.54(m)(1) that a senior operator licensed pursuant to 10 CFR Part 55 shall be present at the facility or readily available on call at all times during reactor operation. Provide justification for not satisfying the above requirement in the proposed TS or revise the proposed TS to assure compliance with the above requirement.

### **Section 6.2.4 ROC Review and Approval Function**

- A. (4) Revise this proposed TS to bring it into conformance with the language of 10 CFR 50.59. As noticed in the *Federal Register* (64 FR 53613, October 4, 1999), the NRC views this change as editorial in nature.
- B. (7) Incorporate the relevant portions of the supplement to your application submitted August 21, 2002. Specifically, update the reference to the proposed TS.

### **Section 6.2.5 ROC Audit Function**

- A. (4) Revise this proposed TS to reflect Amendment No. 16 to Facility License No. R-75, issued December 4, 1995, that removed license condition 3.F, "Physical Security Plan." The proposed TS should be consistent with the requirements of 10 CFR 73.67(f).

### **Section 6.3.1 Reactor Operating Procedures**

- A. (7) Revise this proposed TS to reflect Amendment No. 16 to Facility License No. R-75, issued December 4, 1995, that removed license condition 3.F, "Physical Security Plan." The proposed TS should be consistent with the requirements of 10 CFR 73.67(f).

### **Section 6.6.1 Operating Reports**

- A. Revise this proposed TS to be in accordance with 10 CFR 50.4(b)(1).

### **Section 6.6.2 Special Reports**

- A. (2) Revise this proposed TS to be in accordance with 10 CFR 50.4(b)(1).
- B. (3) Revise this proposed TS to be in accordance with 10 CFR 50.4(b)(1).
- C. (4) Revise this proposed TS to be in accordance with 10 CFR 50.4(b)(1).