50-116

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

December 7, 1978

Docket No. 50-116

Mr. George Burnet
Anson Marsten Distinguished Professor
and Head
Dept. of Chemical Engineering and Nuclear Engineering
Iowa State University
261 Sweeney Hall
Ames, Iowa 50010

Dear Mr. Burnet:

The Operating License (No. R-59) for your Argonaut-Type Model UTR-10, Training and Research Reactor expires October 12, 1979. To renew your license, an application is required that demonstrates that the reactor is capable of continued safe operation and that the reactor components and systems can withstand prolonged use over the term of the renewed license.

General requirements are provided in Title 10 Code of Federal Regulations (10 CFR) Parts 50, 51, 55 and 73. Attached are specific items that will be reviewed during the renewal process.

You are reminded that 10 CFR 2.109 requires that your application be filed in a timely manner and at least 30 days prior to expiration of your current license.

The foregoing is provided to assist you in the license renewal process. Please do not hesitate to contact Steve Ramos (301-492-7435) who has been assigned project manager for your facility.

Sincerely,

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Enclosure:
License Renewal Review Items

LICENSE RENEWAL REVIEW ITEMS

A. Contents of Application

1. General Information (10 CFR 50.33)

Provide applicable information delineated in the referent regulation. The following 10 CFR 50.33 paragraphs obtain:

(e) Include all licenses issued for use on the campus complex.

(f) Financial Considerations - The review process to satisfy 10 CFR 50.33(f) requires information that will show that the licensee possesses the funds necessary to cover estimated operating costs or that there is reasonable assurance of obtaining the funds for the period of the license renewal plus the estimated costs of permanently shutting down the facility and maintaining it in a safe condition. To facilitate reviewing the financial aspects, it is requested that the following information be provided in three signed and notarized originals and six additional copies:

(1) The most recent published annual statement of operations of the University. Indicate, or provide separately, that portion of the budget which clearly delineates the sources of funds to be utilized to cover costs of operation of your reactor facility.

(2) The estimated annual costs to operate the reactor for the additional license renewal period and a certification that amounts designated in your application for renewal of the facility will be included in future budgets.

(3) The estimated costs of permanently shutting down the reactor, a listing of what is included in these costs, the assumptions made in estimating the costs, the type of shutdown contemplated, and the source of funds to cover these costs.

(4) An estimate of the annual cost to maintain the shutdown facilities in a safe condition. Indicate what is included in this estimate, assumptions made in determining the cost, any interest rates assumed, and the source of funds to cover this in perpetuity.

a. The following is provided to assist in determining your estimated costs for permanently shutting down your reactor. Choose the option (see Regulatory Guide 1.86) you deem most appropriate. The following is an example for a TRIGA reactor using the mothballing option for decommissioning.

"It is assumed that dismantling of the core structure and other radioactive portions of the reactor system will be performed 3 to 5 years after complete removal of the fuel. The following provides estimated decommissioning costs (1976 $ value):

a.	Removal and disposal of fuel @ $2000.00/fuel element Approx. 150 x $2000.00	$ 300,000.00
b.	Removal and disposal of core structure	$ 20,000.00
c.	Removal and disposal of reactor tank, beamports, thermal column, etc.	$ 250,000.00
d.	Removal and disposal of reactor exposure room and biological concrete shield	$ 250,000.00
e.	Decontamination	$ 50,000.00
f.	Dismantling of reactor bridge and cooling system	$ 10,000.00
g.	Unexpected expenses	$ 120,000.00
	Total	$1,000,000.00

Three to five (3-5) years cooling period after complete removal of the fuel is necessary before dismantling of the core structure and other radioactive portions of the reactor assembly. During this period the room housing the reactor structure will be maintained as a restricted area under a NRC possession-only license.

It is recommended by Nuclear Regulatory Commission that the same security level be maintained during this period as described in the _____ Research Reactor security plan. Minimum monitoring systems will be such as to insure that the health and safety of the public is not endangered. A facility radiation survey, an environmental survey and an

administrative procedure will be established for the notification and reporting of reportable occurrences.

Estimated cost (1976 $ value) to maintain the shutdown facility in a safe condition:

Personnel

a. Radiological survey, maintenance and administration $ 26,200.00/yr.

b. Supervisory and to prepare and coordinate detailed plan for dismantling and disposal of structure $ 20,000.00

Total amount for a maximum period of 5 years

(5 x $26,200.00) + $20,000.00 $151,000.00"

The foregoing numbers, would of course, be different for your facility and also changed if you choose a different option. This has been provided because of several requests from licensees on what criteria should be considered.

2. Filing of Applications

Provide applicable information as delineated in 10 CFR 50.30 as follows:

(e) Exempt

(f) Environmental Considerations

Attached is a memorandum, "Environmental Considerations Regarding the Licensing of Research Reactors and Critical Facilities" dated January 28, 1974, from D. Muller to D. Skovholt, that provides the general environmental impact of research reactors and may be used as a reference in developing an Environmental Impact Appraisal (EIA). As a result of this memorandum, it was determined that an Environmental Impact Statement (EIS) is not required for research reactors authorized to operate at 2 MW(t) or less. However, an EIA is required and sufficient information must be provided to support and develop the EIA.

3. Technical Information (10 CFR 50.34)

(a) FSAR - (applicable portions) of 10 CFR 50.34(b)

A complete review of your Safety Hazards Report (SAR) will be conducted to ensure no significant safety hazard exists. Data should be included to update the SAR with regard to natural and unnatural phenomena. This information must use current analysis techniques and information. Further, a description and analysis of the structures, systems and components of the facility, with emphasis on the operational performance and the ability to function properly and safely for the term of the license. This is particularly important because the original license was evaluated for a specific term. As some parts have obviously worn and there is some deterioration of the structure, the ability of the facility to operate safely for the requested term is a safety question.

(b) 10 CFR 50.34(b)(6) - Applicable portions

The following pertains to specific items:

(v) Emergency Planning

The requirements for your emergency plan are in Section IV of Appendix E to 10 CFR Part 50. Attached are draft copies of ANS 15.16 "Standard for Emergency Planning for Research Reactors," and Regulatory Guide 2.XX, "Emergency Planning for Research Reactors."

Although in draft form they are being used by Staff reviewers to ensure compliance with Appendix E. You are requested to use these documents as guides in preparing the emergency plan portion of your application.

(vi) Proposed Technical Specifications (T.S.) in accordance with 10 CFR 50.36)

We are currently reviewing your revised Technical Specifications submitted January 17, 1977. As these will meet current format and content, you are not required to resubmit T.S. as part of your renewal application.

(c) Operator Licenses and Requalification Training Program (10 CFR Part 55)

(10 CFR 50.34 (b)(7) and (8).

(d) Physical Security Plan (10 CFR 50.34(c))

Your physical security plan will be reviewed in accordance with guidance provided June 1974 (copy attached) and 10 CFR Part 73 changes published since then. If required, submit six copies of your revised physical security plan (PSP) with your renewal application. As your PSP will become part of the license and referenced as such in the renewed license documentation, it is further requested that the plan be reconciled into a single document. To facilitate further revisions made in accordance with 10 CFR 50.54(p) and amendments submitted for approval, it is requested that the PSP be in loose-leaf format. The following is an example of a license amendment making the PSP part of the license:

"The licensee shall maintain in effect and fully implement all provisions of the NRC Staff-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of documents withheld from public disclosure pursuant to 10 CFR 2.790, collectively titled, "State University of New York Security Plan," as follows:

Original, submitted with letter dated May 31, 1973
Revision 1, submitted with letter dated November 26, 1973
Revision 2, submitted with letter dated January 14, 1974
Revision 3, submitted with letter dated March 11, 1974"

This, of course, is only an example and does not reflect your actual PSP.

Attached is a copy of proposed Regulatory Guide 5.XX. It contains a format to ensure compliance with the regulations. Although not yet issued, it does provide the essential format and guidance to be followed; therefore, it is requested you use this guide in developing your license renewal application.

DOE and State Department have instituted a program to implement the Nonproliferation Act of March 10, 1978, by reducing the enrichment of fuels in nonpower reactors. Concomitant to this, the proposed Regulation § 73.47 is designed to implement the US/IAEA Agreement when approved by the Senate. Both of these actions are keyed to the enrichment of fuel and other SNM; therefore, your license, which authorizes certain possession limits of SNM will be changed to reflect the percent enrichment of U^{235}, the total amount of SNM exempt and how exempt (i.e., 10 CFR 73.6(b)), the total amount of SNM (including Plutonium and U^{235}) authorized. Whatever maximum amount in the foregoing categories you select as non exempt will establish the level of protection of your physical security plan.

In September 1975, a letter was sent to all licensees authorized to possess SNM in excess of 10 CFR 73.1(b) quantities requesting that they review their requirements and provide justification for the "lowest acceptable quantity" necessary to sustain current operations and those projected for the ensuing twelve months. There are still a number of licensees that are authorized to possess quantities in excess of 73.1(b) quantities.

In view of the foregoing, you are requested to review your requirements of maximum SNM possession limits and what level of protection you intend for your physical security plan. Include in your application the maximum amounts of SNM, enrichments, and maximum amounts exempt and nonexempt you need to be included in your license.

B. Standards and Regulatory Guides

For your information, concomitant to the review of items in A above, all documents will include a persual to ensure you have included references and use of applicable ANS/ANSI standards and NRC Regulatory Guides (2.1-2.5) for research reactors.

*Note: 1. All items from referenced 10 CFR articles not listed above are self-explanatory.

2. Above subparagraphs are keyed to 10 CFR paragraphs.

Attachments:
1. Muller/Skovholt Memo dtd. 1/28/74
2. Draft Copy ANS 15.16 - Emergency Planning
3. Draft Copy Reg. Guide 2.XX - Emergency Planning
4. NRC Regulatory Guides 2.1-2.5
5. Draft Copy ANS 15.18
6. NRC Guidance for Administrative Controls
7. Proposed Regulatory Guide 5.XX - Guidance for Physical Security Plans
8. Interim Guidance for Physical Security Plans