



THE UNIVERSITY OF TEXAS  
COLLEGE OF ENGINEERING  
AUSTIN, TEXAS 78712

Department of Mechanical Engineering  
Nuclear Engineering Program  
512-471-5136

January 3, 1980

Mr. Donald J. Skovholt  
Assistant Director for  
Reactor Operations  
Division of Reactor Licensing  
U.S.N.R.C.  
Washington, D.C. 20555

ATTN: License Renewal  
Reference: Docket No. 50-192  
Subject: Renewal of Facility License

Dear Mr. Skovholt:

Pursuant to Section 50.33 of 10 CFR Part 50; application is hereby made for renewal of Facility License R-92 (Class 104) which expires at midnight February 12, 1980.

A. Utilization and Duration of License

The U.T. Triga Mark I nuclear reactor covered in the above facility license has become an integral part of The University of Texas at Austin teaching and research programs, and it is foreseen that the need for reactor operations in the future will continue. Future operations will be carried out in compliance with regulations and limitations currently in effect with Facility License R-92 and SNM-180.

Based on the total amount of fuel available at this facility and on our annual burnup rate, it is estimated that this facility can be operated for a period of twenty years before refueling would be necessary. Renewal of the Facility License R-92 is requested for a period of ten (10) years.

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B. Operational and Shutdown Costs

1. Nuclear Reactor Laboratory Budget

The funding for the nuclear reactor laboratory presently comes through the Department of Mechanical Engineering. Salaries for the administrative secretary (\$10,836 for 1979-80), for an electronic technician (\$17,280 for 1979-80), for a radiochemist (one half-time \$10,920 for 1979-80) and for maintenance and operation (\$15,000 for 1979-80) are included in the general mechanical engineering budget. Other faculty and staff salaries for 1979-80 include the following:

Line 59	Director of Nuclear Reactor Teaching Laboratory	\$ 3,250
Line 60	Nuclear Reactor Supervisor	\$13,405
Line 61	Nuclear Technical Specialist II	\$15,108

This level of funding is expected to be maintained throughout the license renewal period.

2. Shutdown Costs

It is assumed that the U.T. Nuclear Reactor would be completely shutdown utilizing the mothball option. Fuel pins would be removed and the remaining core structure, control rods and tank (6061 Aluminum t1/2 ~ 3 min) buried under high density concrete. The laboratory complex would be left intact as a restricted area under a possession only license and routine radiation and smear surveys would be made by the University Radiation Safety officer requiring no additional manpower or costs. Estimated Shutdown Costs are:

a. Removal and disp. of fuel @ \$2,000/element	\$184,000.00
b. 57 yd <sup>3</sup> high density concrete	<u>2,000.00</u>
Total	\$186,000.00

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C. Environmental Effects of Operation

The environmental effects of the production of radioactive gases and the Design Basis Accident are discussed in the "Technical Information and Hazards Summary Report for a Training Research and Isotope-Production 250Kw, Pulsing Nuclear Reactor at the University of Texas" (see attachment).

The storage or reprocessing of spent fuel elements is not a major concern at the U.T. Nuclear Reactor Laboratory because our typical annual  $U^{235}$  burn-up is approximately 3 grams. During the course of activation analysis experiments and isotope production runs, the Reactor Laboratory generates an average of  $0.3 \text{ m}^3$  of low-level radioactive waste annually. The main constituents of this waste are short-lived isotopes such as  $Na^{24}$ ,  $Al^{28}$ ,  $Cl^{38}$ ,  $Mn^{56}$ ,  $La^{140}$ ,  $Eu^{152}$ ,  $Eu^{154}$ ,  $Dy^{165}$ ,  $Au^{198}$ . These wastes are shipped to authorized disposal sites in approved containers by the Radiation Safety Office.

D. Environmental Effects of Accidents

Accidents ranging from failure of experiments to the largest core damage and fission product release considered possible result in doses of only a small fraction of 10 CFR Part 100 guidelines and are considered negligible with respect to the environment.

E. Unavoidable Effects of Facility Construction and Operation

The unavoidable effects of construction and operation involves the materials used in construction that cannot be recovered and the fissionable material used in the reactor. No adverse impact on the environment is expected from either of the unavoidable effects.

F. Alternatives to Construction and Operation of the Facility

There are no suitable or more economical alternatives which can accomplish both the educational and the research objectives of this facility. These objectives include the training of students in the operation of nuclear reactors, the production of radioisotopes, its use as a source of neutrons for neutron activation analysis, and also its use as a demonstration tool to familiarize the general public with nuclear reactor operations.

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G. Long-Term Effects of Facility Construction and Operation

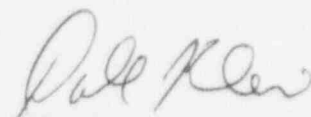
The long-term effects of a research facility such as the U.T. Nuclear Reactor Laboratory are considered to be beneficial as a result of the contribution to scientific knowledge and training. This is especially true in view of the relatively low capital costs involved and the minimal impact on the environment associated with a facility such as the U.T. Nuclear Reactor Laboratory.

H. Costs and Benefits of Facility and Alternatives

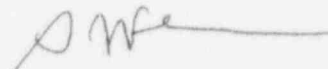
The cost for a facility such as the U.T. Nuclear Reactor Laboratory is on the order of \$1 million with very little environmental impact. The benefits include, but are not limited to: training of operating personnel, conduction of activation analyses, production of short-lived radioisotopes, and education of students and public. Some of these activities could be conducted using particle accelerators or radioactive sources, but these alternatives are at once more costly and less efficient. There is no reasonable alternative to a nuclear research reactor of the types presently used at the U.T. Nuclear Reactor Laboratory for conducting the broad spectrum of activities previously mentioned.

If additional information is needed, please contact Dale Klein (512/471-5136).

Sincerely,

  
Dale E. Klein, Director  
Nuclear Reactor Laboratory

DK:mgm  
Attachment

  
G. J. Fonken  
Vice President for Research

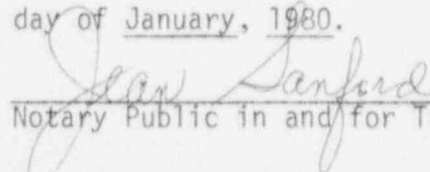
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THE STATE OF TEXAS  
COUNTY OF TRAVIS

Before me, a Notary Public, on this day personally appeared Dale E. Klein and G. J. Fonken known to me to be the persons whose names are subscribed to the foregoing instrument and acknowledged to me that they executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 4th day of January, 1980.

My commission expires 3/31/81

  
Notary Public in and for Travis County