

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Inspection Report: 50-602/92-02  
50-192/9202

Operating Licenses: R-129  
R-92

Licensee: Nuclear Engineering Teaching Laboratory  
10100 Burnet Road  
The University of Texas at Austin  
Austin, Texas 78712

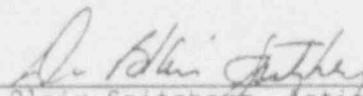
Facility Name: Nuclear Engineering Teaching Laboratory

Inspection At: Taylor Hall and Balcones Research Center  
Austin, Texas

Inspection Conducted: December 7-11, 1992

Inspector: L. T. Ricketson, P.E., Senior Radiation Specialist  
Facilities Inspection Programs Section

Approved:

  
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D. Blair Spitzberg, Acting Chief  
Facilities Inspection Programs Section

1-4-93  
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of decommissioning program, organization and staffing, procedures, operator requalification training, experiments, health physics program, committee audits and reviews, emergency planning, physical security, material control, and accounting.

Results:

- The licensee was complying with the Decommissioning Plan for Taylor Hall and was performing its final surveys.
- There had been no organizational or personnel changes, and the licensee met the Technical Specification staffing requirement.

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- Controlled copies of the licensee's procedures were current and the procedures provided suitable guidance.
- Reactor operators were properly qualified.
- Experiments were properly reviewed and approved.
- The health physics program conformed to the requirements of 10 CFR Part 20.
- There have been no design changes to the facility.
- The Nuclear Reactor Committee met at the required frequency and performed its review function in accordance with Technical Specification requirements.
- Emergency drills were conducted in accordance with the licensee's emergency plan.
- Radioactive materials were prepared properly for transportation and shipments were made without incident.

Summary of Inspection Findings:

- Open Item 602/8904-10 was closed (Section 5).

Attachments

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Physical Security Program Inspection  
(PROPRIETARY INFORMATION)

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## DETAILS

### 1 REACTOR STATUS

#### 1.1 TRIGA - MARK I

The licensee had completed Items 1 - 7 as shown in Section 1.1.6 of the Commissioning Plan. Completed actions included the removal of an activated portion of the reactor tank and the activated portion of the reactor pit. Berms around the reactor pit were used to reduce groundwater intrusion into the pit. Water pumped from the pit was collected in barrels and sampled to ensure compliance with regulatory release requirements. Some contaminated materials and radioactive wastes were still on site at the time of the inspection but were packaged and ready for shipment. Some components and equipment were decontaminated and moved to the Nuclear Engineering Teaching Laboratory for possible future use. The cobalt-60 irradiator was also relocated to the Balcones Research site.

The licensee was in the process of performing final surveys. The inspector performed random surveys on the flooring around the reactor pit and the results agreed closely with those of the licensee. NRC will conduct additional surveys after the licensee has completed its review.

#### 1.2 TRIGA - MARK II

The licensee operated the reactor in the Nuclear Engineering Teaching Laboratory about once per week or the equivalent of approximately 35 megawatt hours since initial criticality on March 12, 1992.

### 2 CLASS II NON-POWER REACTORS (40750)

#### 2.1 Organization and Staffing

The inspector reviewed the licensee's organization and staffing to determine compliance with Technical Specifications 6.1.

There had been no organizational or personnel changes since the previous inspection.

The licensee had two senior reactor operators and met the requirements of Technical Specification 6.1.3. Thus far, the licensee has operated on a single shift.

#### 2.2 Procedures

The inspector reviewed selected operating procedures to determine compliance with Technical Specification 6.3.

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The licensee maintained three sets of controlled copies of procedures. All were current except for one minor exception. Procedure Admin-6, "Authorization of Experiments," had been revised to include the health physicist on the attachment which listed individuals who had reviewed and approved proposed experiments. The latest revision of the procedure which included the revised attachment sheet had not been filed in the controlled copies. The inspector confirmed that the licensee had made very few changes to the procedures since they were reviewed during the previous inspection. The inspector reviewed the health physics procedures and noted that they provided sufficient guidance. These procedures included:

- HP-1 - "Radiation Monitoring - Personnel"
- HP-2 - "Radiation Monitoring - Facility"
- HP-3 - "ETL ALARA Program"
- HP-4 - "Radiation Protection Training"
- HP-5 - "Portable Monitoring Equipment"
- HP-6 - "Radioactive Material Control"
- HP-7 - "Radiation Work Permit"

The inspector noted that HP-5 had been revised to account for neutron scattering which occurred during the calibration of neutron survey instruments.

The licensee had not implemented a procedure which used gas to calibrate the argon-41 monitor. The procedure in effect used a sealed source.

### 2.3 Requalification Training

The inspector reviewed the licensee's requalification program to determine compliance with the requirements of 10 CFR 55.59 and the operator requalification program.

Records of requalification confirmed that the licensee had completed lectures covering the required topics. The reactor supervisor was exempt from testing requirements, but the inspector reviewed the test results of the other senior reactor operator and noted excellent performance.

### 2.4 Experiments

The inspector reviewed the licensee's experiment review and approval process to determine compliance with Technical Specification 6.4.

The number of experiments performed was low. The inspector reviewed minutes of safety review committee meetings and determined that the licensee had approved three categories of experiments. Reviews of the individual experiments were thorough. Reactivity worths had been evaluated, and the inspector did not identify unreviewed safety questions.

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## 2.5 Health Physics

The inspector reviewed the licensee's health physics program to determine compliance with 10 CFR Part 20.

The inspector reviewed personnel monitoring records for 1992 and noted that all radiation exposures were within regulatory limits. Personnel monitoring devices were supplied by a vendor. Selected personnel used extremity monitoring. All personnel wore pocket ion chambers.

The inspector reviewed selected examples of radiation surveys, including startup surveys, and noted that they were performed properly and that records included the information required. The licensee performed radiation measurements at 50, 300, 600, and 1000 kilowatts. No radiation streaming or shielding voids were identified. A routine survey schedule for the facility was established, and the survey program was clearly defined in Procedure HP-2.

Calibration of portable radiation survey instrumentation, except for neutron survey instruments, was performed by the campus radiation safety office. The inspector randomly verified that calibrated instruments were used to perform surveys.

Calibration for the neutron survey instruments were performed using a moderated californium-252 source housed at the Nuclear Engineering Teaching Laboratory. Since the previous inspection, the licensee had evaluated the effects of scattering neutrons in the specific room where calibrations were performed and had formulated correction factors to be applied to the instruments. Procedure HP-5 had been revised to include the new information.

It was noted in the previous inspection report that the argon-41 monitoring system was calibrated using sealed sources rather than gas. Using the same method, the licensee performed an additional calibration of the system in September 1992. Licensee representatives reiterated that they plan to use argon-41 for calibrations during the first operating year; however, they were continuing to trend the performance of the argon monitoring system and to evaluate its efficiency prior to implementing the new methodology. Radioactive gaseous effluents were within Technical Specification limits.

Chapter 9 of the Safety Analysis Report addressed the storing, sampling, and releasing of liquid radioactive wastes; however, licensee representatives stated that there have been no liquid radioactive releases and that the facility was designed so that there should be no releases from the reactor area.

The inspector toured the facility and observed that notices to workers were posted in accordance with the requirements of 10 CFR 19.11 and that areas of the facility were posted in accordance with 10 CFR 20.203 where appropriate.

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Radiation work permits were used in areas in which it was deemed necessary to provide additional guidance to workers. The inspector reviewed selected examples of the radiation work permits and determined that they provided sufficient guidance.

The inspector reviewed the licensee's radiation safety training program and determined that it satisfied the requirements of 10 CFR 19.12. The inspector also verified that selected persons had received the required training. The training program used lectures and films to present topics. The licensee will begin testing individuals who have completed radiation safety training in February 1993.

## 2.6 Design Changes

There have been no design changes which would require a review in accordance with 10 CFR 50.59.

## 2.7 Committee, Audits, and Reviews

The inspector reviewed the activities of the Nuclear Reactor Committee to determine compliance with Technical Specification 6.2.

The inspector determined that the Nuclear Reactor Committee met the requirements for meeting frequency. The committee performed review functions as required by Technical Specification 6.2.3 but had not yet performed the audit functions required by Technical Specification 6.2.4. (The reactor has not yet been in operation for a full year.)

## 2.8 Emergency Planning

The inspector reviewed the licensee's actions to determine compliance with the Emergency Response Plan, Revision 1.

The inspector observed that emergency procedures were current and available to users. Emergency drills were conducted as required with the latest having been conducted on October 30, 1992. The Austin Fire Department and the Austin Emergency Medical Service participated in the drill. Critiques from offsite organizations were reviewed and maintained for future reference.

Current letters of agreement were on file from offsite organizations, such as the county hospital and city fire department. The inspector noted that providing training in radiation safety to members of offsite organizations was not a requirement of the Emergency Plan; however, the licensee was evaluating such training. The inspector spoke to representatives of the offsite organizations who stated that they would be receptive to the training, if their schedule of duties permitted.

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## 2.9 Conclusions

There had been no changes to the licensee's organization or staffing since the previous inspection. The licensee complied with the minimum staffing level required by Technical Specifications.

Appropriate procedures were maintained and reactor operators maintained their knowledge and skill level through a suitable requalification program.

Although few in number at this time, the experiments were reviewed thoroughly and approved by the Nuclear Reactor Committee.

Elements of the health physics program, including personnel exposure control, radiation level monitoring, and radioactive effluent monitoring and control, conformed to the requirements of 10 CFR Part 20.

There were no design changes to the facility.

The Nuclear Reactor Committee performed its required, review function. The reactor had not operated for an entire year; therefore, audits by the committee were not yet required to be completed.

The licensee had conducted an emergency drill within the previous year. The drill included the participation of offsite response organizations.

### 3 FIXED SITE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF LOW STRATEGIC SIGNIFICANCE AND MATERIAL CONTROL AND ACCOUNTING (81401, 81431, and 85102)

The inspector reviewed the implementation of the Physical Security Plan to determine compliance with the requirements of Section 2.C(3) of the Facility Operating License and the requirements of 10 CFR Part 50.54(p).

In accordance with 10 CFR Part 2.790(d), the material concerning the Physical Security Plan is exempt from disclosure. Therefore, this material is discussed in the Attachment 2 to this Appendix and will not be placed in the Public Document Room.

### 4 TRANSPORTATION ACTIVITIES (86740)

The licensee's program was inspected to determine compliance with the requirements of 10 CFR Part 71 and Department of Transportation Regulations 49 CFR 171 through 178.

The inspector reviewed shipping records documenting the transfer of cobalt-60 sources from Taylor Hall to the Nuclear Engineering Teaching Laboratory and noted that the shipments were properly surveyed and the surveys documented. Shipping papers were properly completed and emergency information was provided. Procedures for the transfer were available, and they provided

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sufficient guidance for the workers. The licensee maintained a copy of the certification for the shipping container. The shipment was completed without incident.

#### 5 FOLLOWUP ON PREVIOUS INSPECTION FINDINGS

(Closed) Open Item 602/8904-10: Transfer of Irradiated Reactor Fuel and cobalt-60 Irradiator. Details related to the development of procedures for fuel shipment and training of personnel participating in the transfer were discussed in NRC Inspection Report 50-602/92-01; 50-192/92-01. During this inspection, the inspector reviewed procedures used for the cobalt transfer and found them to be satisfactory. The inspector also determined that individuals involved in the transfer had been adequately trained in the procedures and the potential hazards associated with the operation.

## ATTACHMENT 1

### 1 PERSONS CONTACTED

#### 1.1 Licensee Personnel

##### 1.1.1 Nuclear Engineering Teaching Laboratory

- \*T. L. Bauer, Assistant Director
- \*M. G. Krause, Manager of Operations and Maintenance
- \*B. W. Wehring, Director
- \*J. C. White, Health Physicist

##### 1.1.2 Other University of Texas Organizations

- J. G. Sanchez, Radiation Safety Inspector, Campus Radiation Safety Office
- W. G. Tisdale, Officer, University Police

#### 1.2 Others

- C. Dittman, Regional Inspector, Texas Department of Health, Bureau of Radiation Control
- K. Poisson, Assistant Administrator, Brackenridge Hospital
- C. Wren, Training Coordinator, City of Austin Fire Department

\*Denotes personnel that attended the exit meeting. In addition to the personnel listed, the inspector contacted other personnel during this inspection period.

### 2 EXIT MEETING

An exit meeting was conducted on December 11, 1992. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did identify as proprietary information provided to and reviewed by the inspector which is described in Attachment 2.

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