

November 9, 2000

Mr. Richard L. Holm, Reactor Administrator  
University of Illinois at Urbana-Champaign  
Department of Nuclear Engineering  
Radiation Science Laboratory  
214 Nuclear Engineering Laboratory  
103 South Goodwin Avenue  
Urbana, IL 61801-2984

SUBJECT: NRC ROUTINE, ANNOUNCED INSPECTION REPORT NO. 50-151/2000201

Dear Mr. Holm:

This refers to the inspection conducted on September 26-28, 2000, at the Illinois Advanced TRIGA Reactor. The enclosed report presents the results of that inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, no safety concern or noncompliance to NRC requirements was identified. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

***/RA by M. M. Mendonca Acting For/***

Ledyard B. Marsh, Chief  
Events Assessment, Generic Communications  
and Non-Power Reactors Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No. 50-151  
License No. R-115  
Enclosure: NRC Inspection Report No. 50-151/2000201

cc w/enclosure:  
Please see next page

University of Illinois

Docket No. 50-151

cc:

The Honorable Tod Satterthwaite  
Mayor the City of Urbana  
P.O. Box 219  
Urbana, IL 61803

Illinois Department of Nuclear Safety  
Manager, Office of Nuclear Facility Safety  
1035 Outer Park Drive  
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103 South Goodwin Avenue  
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Test, Research, and Training  
Reactor Newsletter  
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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-151

License No: R-115

Report No: 50-151/2000201

Licensee: University of Illinois

Facility: Illinois Advanced TRIGA Reactor

Location: Urbana, Illinois

Dates: September 26-28, 2000

Inspector: Thomas F. Dragoun

Approved by: Ledyard B. Marsh, Chief  
Events Assessment, Generic Communications and  
Non-Power Reactors Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of selected aspects of the SAFESTOR program for the reactor including: staffing and audit program, radiation protection program, environmental protection program, operator requalification program, surveillance program, emergency preparedness program, safeguards program, and security program since the last NRC inspection of this program.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

### STAFFING AND AUDIT

The organizational structure and audit functions were consistent with Technical Specification requirements.

### RADIATION PROTECTION

The radiation protection program satisfied NRC requirements.

### ENVIRONMENTAL PROTECTION

The environmental protection program satisfied NRC requirements.

### OPERATOR REQUALIFICATION

Operator requalification was conducted as required by the Requalification Program.

### SURVEILLANCE

The surveillance program satisfied Technical Specification requirements.

### EMERGENCY PREPAREDNESS

The emergency preparedness program was conducted in accordance with the Emergency Plan.

### SAFEGUARDS

Special Nuclear Materials were acceptably controlled and inventoried.

### SECURITY

Security activities and systems satisfied Physical Protection Plan requirements.

## Report Details

### Summary of Plant Status

Since the last inspection, reactor operations were permanently ceased on August 9, 1998. On September 22, 1999, the NRC approved the SAFSTOR decommissioning plan for the facility. Prior to this inspection the reactor core had been off-loaded and the fuel stored in the bulk shield tank. The reactor building was unoccupied but accessed frequently by the Reactor Administrator and the Reactor Health Physicist and periodically checked by University Police. Systems required to maintain SAFESTOR conditions were operable.

#### 1. STAFFING AND AUDIT

##### a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- organization and staffing
- management responsibilities
- audits

##### b. Observations and Findings

Staffing consists of two part time personnel, the Reactor Administrator and the Reactor Health Physicist. Both have primary duties in other departments but indicated that University management fully supports and gives priority to reactor related work. The organization was as described in TS 6.1.1 and 6.1.2. Labor was also available from the campus operations and maintenance group.

The membership, meeting frequencies, audit functions and oversight provided by the Reactor Committee were as required by the Technical Specifications.

##### c. Conclusions

The organizational structure and audit functions were consistent with Technical Specification requirements.

#### 2. RADIATION PROTECTION

##### a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- radiation protection program
- radiological signs and posting
- routine surveys and monitoring
- dosimetry records

b. Observations and Findings

Documentation of the radiation protection program is distributed in various documents such as health physics procedures, a campus manual, and laboratory procedures. There is no consolidated policy manual. The Reactor Committee reviews elements of the program during its regular meetings. This satisfies the 10 CFR 20.1101(c) requirement for an annual review of program content and implementation.

Warning signs and postings were appropriate for the radiological conditions. NRC Form 3, "Notice to Employees," was posted in accordance with 10 CFR 19.11. Radiation worker training was satisfactory.

The SAFESTOR plan contained a proposed schedule for routine radiation surveys and monitoring commensurate with the change in status of the facility. This schedule was last revised on June 16, 2000. Records indicate that the scheduled activities were performed.

Use of dosimeters were in accordance with radiation protection requirements. The licensee used a National Voluntary Laboratory Accreditation Program (NVLAP)-accredited vendor to process dosimetry. Radiological exposure records showed that occupational doses were within 10 CFR Part 20 limitations.

The licensee did not require a respiratory protection program or planned special exposure program.

c. Conclusions

The radiation protection program satisfied NRC requirements.

3. ENVIRONMENTAL PROTECTION

a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- control of radioactive effluents
- annual reports
- release records
- counting and analysis program

b. Observations and Findings

Samples of liquid effluents were collected, prepared, and analyzed consistent with generally accepted practices. Laboratory equipment was maintained and calibrated acceptably. Liquid effluent concentrations were below NRC criteria.

Calculations indicated that gaseous effluents to the exhaust stack were within NRC limits. Use of the EPA computer program COMPLY demonstrated that the 10 millirem per year constraint limit was satisfied for airborne effluents.

TLD dosimeters at the facility boundary indicated that exposures to the public from direct shine were well below NRC criteria.

Monitoring results were acceptably documented in the Annual Report. Observation of the facility found no new potential release paths.

c. Conclusions

The environmental protection program satisfied NRC requirements.

4. OPERATOR REQUALIFICATION

a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator training records
- operator physical examination records
- operator examination records

b. Observations and Findings

The Requalification Program was revised in August 1998 due to the proposed SAFESTOR condition of the reactor. Program requirements were tailored to reflect the status of the reactor and facility activities. Records indicated that both licensed operators satisfied the revised program requirements and that their licenses remained active.

c. Conclusions

Operator requalification was conducted as required by the Requalification Program.

5. SURVEILLANCE

a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- surveillance procedures,
- surveillance data sheets and records

b. Observations and Findings

Surveillances were completed on schedule and in accordance with licensee procedures. All the recorded results were within the TS and procedurally prescribed parameters.

c. Conclusions

The surveillance program satisfied Technical Specification requirements.

6. EMERGENCY PREPAREDNESS

a. Scope (IP 40755)

The inspector reviewed selected aspects of:

- the Emergency Plan
- implementing procedures
- training records
- offsite support
- emergency drills and exercises

b. Observations and Findings

The Emergency Plan (E-Plan) was revised in June 1997 to incorporate improvements and submitted to the NRC in accordance with 10 CFR 50.54(q). The E-Plan was biennially reviewed by the Reactor Committee as required. Implementing procedures were reviewed and revised as needed to employ the E-Plan effectively.

The agreement with the outside response organization, Champaign County Emergency Services and Disaster Agency (ESDA), needed to be updated in accordance with the licensee's procedures. However, drill critiques indicated the ESDA was an active participant in the recent drills.

Communications capabilities were acceptable and had been tested as stipulated in the E-Plan. Emergency drills had been conducted as required by the E-Plan. Critiques were held following the drills to discuss the strengths and weaknesses identified during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented and filed.

Emergency preparedness and response training was being completed as required. The critique of a recent drill determined that the ambulance crews misunderstood the policies regarding handling of injured personnel contaminated with hazardous materials. Due to the various hazmats in laboratories on campus, training of the ambulance crews was expanded to include these other conditions on campus. This effort demonstrated a program strength.

c. Conclusions

The emergency preparedness program was conducted in accordance with the Emergency Plan.

7. SAFEGUARDS

a. Scope (IP 85102)

The inspector reviewed selected aspects of:

- nuclear material inventory
- accountability records

b. Observations and Findings

The material control and accountability program tracked locations and content of fuel and fission detectors under the research reactor license. The material control and accountability forms (DOE/NRC Forms 741 and 742) were prepared and transmitted as required.

The radium-beryllium start-up source was controlled under the facility general license.

c. Conclusions

Special Nuclear Materials were acceptably controlled and inventoried.

8. SECURITY

a. Scope (IP 81431)

The inspector reviewed selected aspects of:

- the Physical Protection Plan
- security systems and equipment
- implementation of the Physical Protection Plan

b. Observations and Findings

The Physical Protection Plan was reviewed and amended in June 2000. The NRC was notified of the changes in a timely manner as required by 10 CFR 50.54(p). Physical protection systems (barriers and alarms), equipment and key control were as required by the Physical Protection Plan. Access control was as required. Security response and training were acceptable.

c. Conclusions

Security activities and systems satisfied Physical Protection Plan requirements.

9. EXIT INTERVIEW

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on September 28, 2000. The licensee acknowledged the findings presented.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

R. Holm, Reactor Administrator  
M. Kaczor, Reactor Health Physicist  
M. Kushner, Associate Dean, Administrative Affairs and Head, Experiment Station  
J. Stubbins, Department Head, Nuclear, Plasma, and Radiological Engineering

### State of Illinois

A. Cecil Settles, Illinois Department of Nuclear Safety

## INSPECTION PROCEDURES USED

IP 40755	CLASS III NON-POWER REACTORS
IP 81431	FIXED SITE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF LOW STRATEGIC SIGNIFICANCE
IP 85102	MATERIAL CONTROL AND ACCOUNTING

## ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED: None

CLOSED: None

## LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
ESDA	Emergency Services and Disaster Agency
hazmats	hazardous materials
IP	Inspection Procedure
TLD	ThermoLuminescent Dosimetry
TS	Technical Specifications