

October 4, 2000

Mr. Paul M. Whaley, Manager
KSU Nuclear Reactor Facility
Department of Mechanical and
Nuclear Engineering
112 Ward Hall
Kansas State University
Manhattan, KS 66506-5204

SUBJECT: NRC ROUTINE, ANNOUNCED INSPECTION REPORT NO. 50-188/2000-201

Dear Mr. Whaley:

This letter refers to the inspection conducted on August 28-31, 2000, at your Nuclear Reactor Facility. The enclosed report presents the results of that inspection.

Various aspects of your reactor operation and security programs were inspected, including selective examinations of procedures and representative records, interviews with personnel, and observations of the facility.

Based on the results of this inspection, no safety concern or noncompliance with 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. Stephen Holmes at 301-415-8583.

Sincerely,

/RA/

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. 50-188
License No. R-88

Enclosure: NRC Inspection Report No. 50-188/2000-201
cc w/enclosure: See next page

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/RA by Marvin M. Mendonca Acting for/
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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-188

License No: R-88

Report No: 50-188/2000-201

Licensee: Kansas State University

Facility: TRIGA MK-II

Location: Manhattan, Kansas

Dates: August 28-31, 2000

Inspector: Stephen W. Holmes

Approved by: Ledyard B. Marsh, Director
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 organizational structure and functions program, operations program, review and audit program, experimental program, fuel handling program, operator requalification program, surveillance program, maintenance program, design control program, procedural control 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.

ORGANIZATIONAL STRUCTURE AND FUNCTIONS

The organizational structure and functions were consistent with Technical Specification(TS) requirements.

OPERATIONS

The operations program satisfied TS requirements.

REVIEW AND AUDIT

The review and audit program satisfied TS requirements.

EXPERIMENTS

Control and performance of experiments met TS and procedural requirements.

FUEL HANDLING

The fuel handling program satisfied licensee TS and procedural requirements. One Non-Cited Violation was closed.

OPERATOR REQUALIFICATION

The Requalification program was being acceptably implemented. TS and NRC-approved Requalification plan requirements were met.

SURVEILLANCE

The surveillance program satisfied TS requirements. One Inspector Follow-up Item regarding limiting conditions for operations (LCO) verifications was opened.

MAINTENANCE

Maintenance logs, records, performance, and reviews satisfied TS and procedure requirements.

DESIGN CHANGES

The licensee's design change procedures were in place and were implemented as required.

PROCEDURES

The procedural control and implementation program satisfied TS requirements.

SECURITY

Security activities and systems satisfied 10 CFR 73.67 requirements.

Report Details

Summary of Plant Status

Since the last inspection the reactor was operated intermittently to support experiments, education, operator training, surveillance, and service work.

1. **ORGANIZATIONAL STRUCTURE AND FUNCTION**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- Operations organization and staffing
- qualifications
- management responsibilities
- administrative controls

b. Observations and Findings

The organizational structure has not changed since the last inspection. The Reactor Manager (RM) position has been filled and the Mechanical and Nuclear Engineering Department is searching for a replacement for the recently vacated Reactor Supervisor (RS) position. The facility has one licensed senior reactor operator (SRO) remaining on staff and three part time reactor operators (RO) available for operations.

Operation logs and records confirmed that shift staffing met the duty and on-call personnel requirements. Review of records verified that management responsibilities were administered as required by TS and applicable procedures.

Although the staffing meets the minimum requirements, with only one SRO, the Acting RS operations are restricted to when the RS is on site. Additionally, with the ROs being only volunteer or part time, further reductions in staffing could halt operations.

Licensee representatives stated that the RM is scheduled to take an instant SRO license exam by the beginning of next year and that a reactor operations class was to be started this semester.

c. Conclusions

The organizational structure and functions were consistent with TS requirements.

2. **OPERATIONS PROGRAM**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- operational logs and records
- staffing for operations
- selected operational, startup, or shutdown activities

b. Observations and Findings

Reactor operations were carried out following written procedures and TS. Observations by the inspector confirmed information on operational status of the facility was recorded in log books and checklists as required by procedures and TS. The operating logs and records were clear and provided an indication of licensed activities. Significant problems and events noted in the operations log were reported and quickly resolved as required by TS and administrative procedures. Logs and records also showed that operational conditions and parameters were consistent with license and TS requirements.

Unanticipated shutdowns were identified in the logs and records, and reported and resolved

c. Conclusions

The operations program satisfied TS requirements.

3. **REVIEW AND AUDIT**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- Reactor Safety Committee (RSC) minutes
- safety review records
- audit records
- responses to safety reviews and audits
- review and audit personnel qualifications

b. Observations and Findings

Records showed that the safety reviews were conducted at the TS required frequency. Topics of these reviews were also consistent with TS requirements to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor.

The audit records showed that audits had been completed in those areas outlined in the TS and at the required frequency.

The inspector noted that the safety reviews and audits and the associated findings were acceptably detailed and that the licensee responded and took corrective actions as needed.

The RSC reviewed and approved experiments, procedures, facility changes, and changes to them as required by TS and facility procedures. Records reviewed by the inspector confirmed the committee was actively involved in reviewing events and operations of the reactor.

c. Conclusions

The review and audit program satisfied TS requirements.

4. **EXPERIMENTS**

a. Scope (69001)

The inspector reviewed selected aspects of:

- experimental program requirements
- procedures
- logs and records
- experimental administrative controls and precautions

b. Observations and Findings

The experiments at the facility were routine procedures that have been in place for several years. No new or unknown-type experiments had been initiated, reviewed, or approved since the last inspection. The experiments were completed with the cognizance of the Reactor Supervisor and a Senior Reactor Operator and in accordance with TS requirements. Review of recent experimental operations confirmed that experiments were installed, performed, and removed as outlined in the experiment authorization and procedures. The results of the experiments were documented in appropriate experimental logs, data sheets, or records. Engineering and radiation protection controls were implemented as required to limit exposure to radiation.

c. Conclusions

Control and performance of experiments met TS and procedural requirements.

5. **FUEL HANDLING**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- fuel handling procedures
- fuel handling equipment and instrumentation
- fuel handling and examination records

b. Observations and Findings

Collectively, several related procedures provided a method to move and handle fuel consistent with the provision of the TS and the licensee safety analyses. Fuel movement and fuel examination records showed that the fuel was moved and examined as required. Records also show that fuel-handling and monitoring equipment and instrumentation was verified operable prior to use. Personnel were knowledgeable of the procedural and equipment requirements for criticality control and assurance of fuel integrity. Radiological and security precautions were also met in accordance with applicable procedures.

Initially the inspector could not verify from these records that the required minimum staffing was present during the latest fuel movement. Fuel movement requires a minimum of three persons, an SRO on the reactor bridge, a second person on the bridge trained in fuel movement, and an RO or SRO on console. Further interviews with staff and review of additional records provided reasonable assurance that fuel handling staffing had been met during fuel movements.

The RM stated that they would ensure appropriate documentation is on hand to verify that fuel handling personnel requirements are met. This will be reviewed during a future inspection as an Inspector Follow-up Item (IFI 50-188/2000-201-01).

During the recent fuel movements the " LeDo " tube was moved from its in-core position, and subsequent power operations performed in this allowed configuration. However, procedures require that all movement of fuel and other items into and out of the core be recorded in the reactor log. This was not done in this case. The RS identified this omission, reported it to management, and the RSC. The tube was reinstalled in the core, the reactor log was updated, and training was given to the SRO, ROs, and other staff on required recording of movement in the core. The RSC reviewed and approved the incident and corrective actions. This minor and licensee corrected violation is being treated as a Non-Cited Violation consistent with Section VII.B.1 of the NRC Enforcement Policy. (NCV 50-188/2000-201-01)

c. Conclusions

The fuel handling program satisfied licensee TS and procedural requirements.

6. **OPERATOR REQUALIFICATION**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator training records
- operator physical examination records
- operator examination records
- operator active duty status

b. Observations and Findings

The Requalification Program was maintained up-to-date. All currently licensed operators and senior operators were successfully completing the emergency procedure and abnormal events training, reactivity manipulations, and participating in the ongoing training as required by the NRC-approved Requalification plan. Training was provided to the reactor operators on maintenance operations and 10 CFR 50.59 design changes and evaluations. Annual written and operational exams were given and documented as required. Biennial medical exams had been performed as required. Logs showed that operators maintained active duty status as required.

c. Conclusions

The Requalification program was being acceptably implemented. TS and NRC-approved Requalification plan requirements were met.

7. **SURVEILLANCE**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- surveillance and calibration procedures
- surveillance, calibration, and test data sheets and records
- reactor operations, checks, tests, verifications and a TS surveillance were observed.

b. Observations and Findings

Daily and other periodic checks, tests, calibrations, and verifications for TS required LCO were completed as required. All surveillance and LCO verifications were completed on schedule as required by TS and in accordance with licensee procedures. All were within prescribed TS and procedure parameters and in close agreement with the previous surveillance results. The records and logs reviewed were complete and were being maintained as required.

Some of the daily and periodic checks of equipment operability included recording system parameters such as temperature, pressure, and flow. All values checked by the inspector satisfied the limits/parameters listed in the procedure or checklist.

The TS prescribes surveillances to verify some, but not all LCO. The RM stated they would evaluate how LCO verifications would be maintained for those where no TS surveillance requirement exists. This will be reviewed during a future inspection as an Inspector Follow-up Item (IFI 50-188/2000-201-02).

c. Conclusions

The surveillance program satisfied TS requirements.

8. **MAINTENANCE**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- maintenance procedures
- equipment maintenance records
- physical condition of facility

b. Observations and Findings

Logs indicated that corrective maintenance activities and problems were addressed as required by procedure. Records showed that routine maintenance activities were

conducted at the required frequency and in accordance with the TS, applicable procedure or equipment manual. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements. Further, maintenance activities were consistent with the requirements of 10 CFR 50.59.

c. Conclusions

Maintenance logs, records, performance, and reviews satisfied TS and procedure requirements.

9. **DESIGN CHANGES**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- facility design changes and records
- facility configuration
- RSC minutes
- facility configuration

b. Observations and Findings

Records and observations showed that changes at the facility were acceptably reviewed in accordance with 10 CFR 50.59 and applicable licensee administrative controls. None of the changes constituted an unreviewed safety question or required a change to the TS.

The ventilation modification #9 was reviewed. The evaluation was acceptable with supporting documentation and information. RSC involvement was also comprehensive. Post installation verification testing of the systems was performed. Procedure and drawing changes were included and were consistent with the observations by the inspector.

Documentation of the changes was kept in the RSC notebook along with pertinent correspondence.

c. Conclusions

The licensee's design change procedures were in place and were implemented as required.

10. **PROCEDURES**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- administrative controls
- records for changes and temporary changes
- procedural implementation
- logs and records

b. Observations and Findings

Written procedures required by the TS were available and used by the staff. The inspector observed procedures used during operations. Implementation of and adherence to the procedures was acceptable. Administrative control of changes and temporary changes to procedures, and associated review and approval processes were as required. Review of procedures verified that changes had been evaluated and approved as required.

Training of personnel on procedures and changes was acceptable.

c. Conclusions

The procedural control and implementation program satisfied TS requirements.

11. **SECURITY**

a. Scope (Inspection Procedure 81401/81431)

The inspector reviewed selected aspects of:

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

b. Observations and Findings

The Physical Protection Plan was removed from the license with TS Amendment No. 11. Amendment No. 11 to the Facility Operating License No. R-88 deleted the requirement that a Physical Protection Plan be maintained. However security in accordance with the provisions of 10 CFR 73.67(f), "Fixed site requirements for special nuclear material of low strategic significance," must continue to be maintained. Physical protection systems (barriers and alarms), equipment and instrumentation were in place. Access control was as required. Implementing procedures were consistent with the licensee's requirements. Acceptable security response and training was demonstrated through alarm response and drill response in accordance with procedures.

c. Conclusions

Security activities and systems satisfied 10 CFR 73.67 requirements.

12. **MEETING SUMMARY**

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on August 31, 2000. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

Partial List of Persons Contacted

*T. Etzel	Reactor Supervisor
*R. Hagler	Reactor Operator
*M Ohmes	Reactor Operator
*J. Thompson	MNE Department Head and RSC Chair
*P. Whaley	Reactor Manager

* Attended out briefing 8/31/2000

Inspection Procedures Used

IP 69001	Class II Non-Power Reactors
IP 81401	Plans, Procedures, and Reviews
IP 81431	Fixed Site Physical Protection of LSNM

Items Opened and Closed

Open

IFI 50-188/2000-201-01	Licensee to ensure appropriate documentation is on hand to verify fuel handling personnel requirements are met.
IFI 50-188/2000-201-02	The licensee to evaluate how LCO verifications would be maintained for those where no TS surveillance requirement exists.

Closed

NCV 50-188/2000-201-01	LeDo tube core movement not documented in reactor log.
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List of Acronyms Used

LCO	Limiting Conditions for Operations
NRC	Nuclear Regulatory Commission
RM	Reactor Manager
RO	Reactor Operator
RS	Reactor Supervisor
RSC	Reactor Safety Committee
SRO	Senior Reactor Operator
TS	Technical Specifications