November 22, 2011

Dr. Dennis O'Neil, Deputy Director
Texas Engineering Experiment Station
Texas A&M University
203 Jack E Brown Bldg., MS 3122
College Station, TX 77843-3122

SUBJECT: TEXAS ENGINEERING EXPERIMENT STATION, NRC ROUTINE INSPECTION REPORT NO. 50-128/2011-201

Dear Dr. O'Neil:

On October 31 to November 3, 2011, the U. S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at your Nuclear Science Center TRIGA Research Reactor Facility. The enclosed report documents the inspection results, which were discussed on November 3, 2011, with Dr. W. D. Reece, Director of the Nuclear Science Center, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390 "Public inspections, exemptions and requests for withholding" a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (Agencywide Documents Access and Management System (ADAMS)). Adams is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Mike Morlang at (301) 415-4092 or by electronic mail at Gary.Morlang@nrc.gov.

Sincerely,

/RA/
Johnny H. Eads Jr., Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-128
License No. R-83

Enclosure: NRC Inspection Report No. 50-128/2011-201

cc w/encl: Please see next page

cc:
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P.O. Box Drawer 9960
College Station, TX 77840-3575

Governor's Budget and
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Austin, TX 78711

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Test, Research and Training
Reactor Newsletter
202 Nuclear Sciences Building
University of Florida
Gainesville, FL 32611

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ACCESSION NO.: ML113250004 *** via e-mail** **TEMPLATE #: NRC-002**

OFFICE	PROB	PROB:LA	PROB:BC
NAME	GMorlang	GLappert	JEads
DATE	11/17/2011	11/21/2011	11/22/2011

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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No:	50-128
License No:	R-83
Report No:	50-128/2011-201
Licensee:	Texas A&M University
Facility:	Nuclear Science Center Reactor
Location:	College Station, TX
Dates:	October 31 - November 3, 2011
Inspectors:	Mike Morlang Ossy Font (Trainee)
Approved by:	Johnny H. Eads Jr., Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Texas A&M University
Nuclear Science Center Reactor
Inspection Report No. 50-128/2011-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the Texas A & M University (the licensee's) Class II research and test reactor safety programs including: organization and staffing, operations logs and records, requalification training, surveillance and limiting conditions for operation, emergency preparedness, maintenance logs and records, and fuel handling and movement,.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with U. S. Nuclear Regulatory Commission (NRC) requirements.

Organization and Staffing

- The licensee's organization and staffing and assignment of responsibilities remained in compliance with the requirements specified in Technical Specification Section 6.

Operations Logs and Records

- Operational activities were consistent with applicable Technical Specification and procedural requirements.

Requalification Training

- The Requalification Program was generally being completed as required and records were being maintained.

Surveillance and Limiting Conditions for Operation

- The program for Surveillance and Limiting Conditions for Operations was implemented in accordance with Technical Specifications Sections 3.0 and 4.0 requirements.

Emergency Preparedness

- Emergency preparedness training for staff personnel was being completed as required.
- Annual drills were being conducted as required by the Emergency Plan.
- Off-site support was available and acceptable.
- Emergency responders were knowledgeable of proper actions to take in case of an emergency.

- Emergency response facilities and equipment were being maintained as required.

- The Emergency Plan and Implementing Procedures were being reviewed annually as required and updated as needed.

Maintenance Logs and Records

- Maintenance was being completed as required.

Fuel Handling and Movement

- The fuel handling activities and documentation were conducted in accordance with the facility Technical Specifications.

REPORT DETAILS

Summary of Plant Status

The Texas A&M University (the licensee's) TRIGA research reactor, licensed to operate at a maximum steady-state thermal power of one megawatt (MW), continues to be operated in support of operator training, surveillance, research, and utilization involving isotope production. During the inspection the reactor was operated each day at full power to conduct sample irradiations.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69001)

To verify that the licensee's organization and staffing were as stated in Section 6.1 of the Technical Specifications (TS) for the Texas Engineering Experimental Station (TEES), Texas A&M University (TAMU) System Nuclear Science Center Reactor (NSCR) Facility, Amendment No 17, dated July 22, 2009, the inspectors reviewed:

- Organization and staffing for the TAMU Nuclear Science Center (NSC)
- Administrative controls and management responsibilities specified in the NSC TS Section 6
- Annual Report for the Texas A&M University Nuclear Science Center for 2009, dated March 30, 2010
- Annual Report for the Texas A&M University Nuclear Science Center for 2010, dated March 30, 2011
- NSC Standard Operating Procedure (SOP), Section I, Procedure C, "Administration," Revision (Rev.) 0, dated March 6, 1990
- Radiation Safety Board Meeting Minutes for April 8, 2009
- Radiation Safety Board Meeting Minutes for May 13, 2010
- Radiation Safety Board Meeting Minutes for September 15, 2010
- Radiation Safety Board Meeting Minutes for May 26, 2011

b. Observations and Findings

The structure and functions of the licensee's organization at the TEES, NSCR Facility had not functionally changed since the last NRC inspection (refer to NRC Inspection Report No. 50-128/2009-201). Although various individuals who had previously worked at the facility had found other employment, the licensee's current organizational structure and assignment of responsibilities, as reported in the Annual Reports, were consistent with those specified in the TS Section 6.1.1. All positions reviewed were filled with qualified personnel. Review of records verified that management responsibilities were generally administered as required by TS Section 6.1.2 and applicable procedures.

The Radiation Safety Board (RSB) held meetings at a frequency required by TS (minimum one per year). Quorum and a minimum of voting members were present.

c. Conclusion

The licensee's organization and staffing were in compliance with the requirements specified in TS Section 6.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS Sections 2, 3, and 6 and the applicable procedures:

- Scram Log
- Staffing for operations as recorded on the reactor log sheets
- NSCR Operations Log Books Numbers 207-216, dated from July 24, 2009 to October 12, 2011
- Selected entries on the following facility forms:
  - NSC Form 531, entitled "Morning Facility Checklist - Daily," latest revision dated November 14, 2008, from January 2010 to September 2011
  - NSC Form 532, entitled "TRIGA Reactor Pre-startup Checklist," latest revision dated July 27, 2011, from January 2010 to September 2011
  - NSC Form 533, entitled "Reactor Operations Facility Checklist - Daily Surveillance," latest revision dated November 14, 2008, from January 2010 to September 2011
  - NSC Form 534, entitled "Facility Security Shutdown Checklist - Daily Surveillance," latest revision dated April 4, 2011, from January 2010 to September 2011
  - NSC Form 573, entitled "Irradiation Cell Entry Log," latest revision dated August 2, 2001
  - NSC Form 574, entitled "Irradiation Cell Operations Checklist," latest revision dated September 14, 2006
  - NSC Form 590, entitled "Unscheduled Scram Recovery Checklist," latest revision dated October 5, 2004
- Selected TAMU NSC Daily SRO Checklists for 2010 and 2011
- NSC SOP, Chapter II, "Reactor Operations," Section II-A, "General Organization and Responsibilities," Rev. 1, dated February 9, 2000
- NSC SOP, Chapter II, "Reactor Operations," Section II-B, "Operations Records," Rev. 3, dated February 9, 2000
- NSC SOP, Chapter II, "Reactor Operations," Section II-C, "Reactor Startup," Rev. 5, dated August 19, 2003
- NSC SOP, Chapter II, "Reactor Operations," Section II-D, "Steady State Mode Operation," Rev. 1, dated September 3, 1999

- NSC SOP, Chapter II, "Reactor Operations," Section II-F, "Reactor Shutdown," Rev. 0, dated December 15, 1993
- NSC SOP, Chapter II, "Reactor Operations," Section II-G, "Movement of Reactor Bridge," Rev. 1, dated March 17, 1997
- NSC SOP, Chapter II, "Reactor Operations," Section II-M, "Response to Alarms," Rev. 1, dated February 9, 2000
- NSC SOP, Chapter II, "Reactor Operations," Section II-E, "Pulsing Operations," Rev. 3, dated September 3, 1999
- Memorandum from W. D. Reece, Director, to M. Spellman, Associate Director, "Change to Minimum Staff Requirements for Reactor Start-Up (SOP II-C)," dated April 24, 2003

b. Observations and Findings

Reactor operations were carried out following written procedures and TS requirements. Information on the operational status of the facility was recorded in log books and on checklists as required by procedure. Use of maintenance and repair logs satisfied procedural requirements. Operational problems and events noted in the appropriate logs were reported, reviewed, and resolved as required. The inspectors verified that required items were logged and cross referenced with other logs and forms, as required, and that TS Sections 2 and 3 operational limits had not been exceeded. Operations logs and records also documented that shift staffing met the minimum requirements for duty and on-call personnel.

The inspectors conducted observations of the reactor staff performing pre-startup checks and a startup to 1 MW on November 2, 2011. The inspectors noted that the licensed reactor operator and trainee were knowledgeable and competent. Observation of operational activities on November 1-3, also confirmed that reactor operations were carried out in accordance with written procedures and TS requirements.

In 2009 there were four unplanned scrams and in 2010 there were 22 unplanned scrams. The increase can be attributed to the loss of the senior electronics technician.

c. Conclusion

Operational activities were consistent with applicable TS and procedural requirements.

3. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (IP 69001)

To verify that operator requalification activities and training were conducted as required in the licensee's "Senior Reactor Operator and Reactor Operator Requalification Program," Rev. 4, dated April 1997, and to verify that medical requirements were met, the inspectors reviewed:

- Medical examination records
- Active license status of all current operators
- Written examinations given to operators for 2009, and 2010
- Selected portions of NSC Reactor Operations Log Books for 2007 through the present
- Logs and records of reactivity manipulations for 2009 through the present
- Training lectures and records for selected individuals for the current and previous training cycles documented on:
  - NSC Form 521, "Reactor Operations Two-Year Training Cycle," latest revision dated October 1, 2006
  - NSC Form 522, "Reactor Operator Two-Year Training Records," latest revision dated January 31, 2005
  - NSC Form 523, "NSC Reactor Operator Requalification/Training Lecture," latest revision dated April 16, 2010
  - NSC Form 524, "SRO and RO Requalification Exam Cover Sheet," latest revision dated October 8, 2007
- Radiation Safety Board Reactor Requalification Program Audits dated December 7, 2009, October 1, 2010, and August 5, 2011
- NSC SOP, Chapter X, "Reactor Operator Requalification Program," Rev. 2, dated March 2, 2001

b. Observations and Findings

The facility had five qualified, licensed SROs and two Reactor Operators (ROs). The facility had 4 SRO's and 2 RO's who were removed from licensed duties for failure to complete various aspects of the requalification program. Items such as lack of participation in the recent requalification exam or failure to complete required reactor manipulations were the reason for removal from licensed duties. As of the date of the inspection, all of the operators' licenses were current.

A review of the logs and requalification records showed that annual operational examinations were being administered as required. Written examinations were administered within the time frame as required. In order to comply with the requirement for actively performing their operator functions for a minimum of four hours per calendar quarter, the licensee included time spent on the reactor console, supervisory functions, and maintenance, as appropriate. This was consistent with 10 CFR Part 55 requirements.

TAMU "Senior Reactor Operator and Reactor Operator Requalification Program," Rev. 4, dated April 1997, requires in Section 2.1 that one or more lectures will be scheduled within a four month interval to cover a topic (i.e., Theory and Principles of Operation, Reactor Regulations, Reactor Design, Reactor Support Systems, Radiation Control and Safety, Emergency Plan, and Security Plan.). The lecture sequence over all topics will take two years to complete and will then be repeated. Self-study or individual tutoring may substitute for each missed lecture, however, examinations given after each lecture must be taken or an alternate examination taken within a month after the lecture. Lectures on the Emergency Plan and Security Plan will be given annually.

Regulation 10 CFR 55.21 states in part that, in order for a reactor operator to maintain an active NRC license, each reactor operator must have a satisfactory medical examination every two years. The inspector noted that biennial medical examinations had not been completed for three operators and were two months overdue. These individuals had medical evaluations scheduled. Although this issue should be corrected, it is of minor safety significance but could be a potential violation. The license was informed that this issue would be an Unresolved Item[1] and would be reviewed during the next inspection. URI 50-128/2011-201-1

c. Conclusion

Required records documenting the Requalification Program were being maintained. The licensee was informed of the Unresolved Item related to operator medical evaluations.

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

To determine that surveillances and Limiting Conditions for Operations (LCOs) verifications were being completed as required by TS Sections 3.0 and 4.0, the inspectors reviewed:

- NSC Reactor Operations Log Books Numbers 207-215 (October 13, 2009 to present)
- Surveillance and calibration data and records for 2010 and 2011 documented on the following facility forms:

[1]An Unresolved Item is a matter about which more information is required to determine whether the issue in question is an acceptable item, a deviation , a nonconformance, or a violation.

  - NSC Form 557, entitled “Annual Reactor Maintenance and Surveillance,” dated May 20, 2008, for 2010 and 2011
  - SC Form 546, entitled “Semiannual Fuel Element Temperature Measuring Channel Maintenance,” dated July 15, 2008, from February 23, 2009 to August 1, 2011
  - NSC Form 547, entitled “Semiannual Linear Power Measuring Channel Maintenance and Surveillance,” dated February 16, 2000, from February 12, 2009 to present
  - NSC Form 539, entitled “Weekly Ventilation and Scram Surveillance,” dated June 30, 2009, from January 2, 2009 to present
  - NSC Form 541, entitled “Quarterly Transient Rod Drive Maintenance,” dated October 4, 1999, from June 23, 2009 to present
  - NSC Form 549, entitled “Semiannual Reactor Pulse Power Surveillance,” dated October 15, 1999, from December 2, 2009 to present
  - NSC Form 550, entitled “Semiannual Transient Rod Drive Maintenance,” dated October 4, 1999, from June 25, 2009 to present
  - NSC Form 551, entitled “Semiannual Scram Circuit Surveillance,” dated July 9, 2005, from June 12, 2009 to present
  - NSC Form 552, entitled “Semi-Annual Evacuation Horn System Surveillance,” dated October 4, 1999, from February 23, 2009 to present
  - NSC Form 565, entitled “Annual Calorimetric,” dated July 5, 2010, from August 6, 2009 to present
- Texas A&M University NSC 2009 Annual Report, dated March 30, 2010
- Texas A&M University NSC 2010 Annual Report, dated March 30, 2011

b. Observations and Findings

The inspectors determined that selected daily, monthly, annual, other periodic checks, tests, verifications, and calibrations for TS-required surveillances and LCOs were completed as stipulated. Surveillances, LCOs, and calibration reviews were completed on schedule and performed in accordance with licensee procedures. The recorded results were within the TS and procedurally prescribed parameters and in close agreement with the previous surveillance results. The records and logs reviewed were accurate, but incomplete, some items were noted in the console log and the surveillance check sheet but the actual completed procedure could not be located.

c. Conclusion

The program for Surveillance and LCO confirmations was implemented in accordance with Technical Specifications Sections 3.0 and 4.0 requirements.

5. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify compliance with TS Section 6.2 and the licensee's Emergency Plan (E-Plan) for the TEES, Texas A&M University System NSCR Facility, Revision 2, dated December 14, 1999, the inspectors reviewed selected aspects of:

- Annual training records for the College Station Fire Department dated August 2010 and July 2011, the Texas A&M Environmental Health and Safety Department dated June 17, 2011 and April 21, 2010, and the College Station Medical Center dated March 2, 2010 and March 4, 2011
- Offsite support and annual reconfirmation of letters of agreement between NSC and the College Station Medical Center and the annual agreement letter between NSC and the College Station Fire Department (dated September 26, 2011)
- Emergency drills and exercises for 2010 and 2011
- Emergency response facilities, supplies, equipment and instrumentation
- Summary of emergency drill conducted May 2011 involving off-site participation
- Radiation Safety Board Meeting Minutes for May 13, 2010
- Radiation Safety Board Meeting Minutes for September 15, 2010
- Radiation Safety Board Meeting Minutes for May 26, 2011
- Texas A&M University NSC 2009 Annual Report, dated March 30, 2010
- Texas A&M University NSC 2010 Annual Report, dated March 30, 2011
- NSC Form 583, entitled "Emergency Director's Checklist," dated August 6, 1992

b. Observations and Findings

The licensee staff and the RSB audited and reviewed the E-Plan and Implementing procedures to effectively execute the E-Plan at least annually.

Through records review, and interviews with licensee, the inspectors determined that emergency responders were trained in the proper actions to take in case of an emergency. Agreements with outside response organizations had been updated and maintained as necessary. Based on a review of training records, it is evident that the College Station Fire Department continues to support the facility. Fire station personnel from all shifts had participated in training and personnel from the College Station Medical Center participated in training on March 4, 2011.

Emergency facilities, instrumentation, and equipment were being maintained and inventoried as required by E-Plan Sections 10.4 and 10.5. To ensure appropriate emergency response personnel are notified in the event of an emergency, the emergency notification roster was updated and verified quarterly as required by E-Plan Section 8.5.

c. Conclusion

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

6. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To determine that maintenance was being completed as required by the TS and applicable procedures, the inspectors reviewed:

- NSC Reactor Operations Log Books Numbers 215-217, dated from May 12, 2011 to present
- Surveillance and calibration data and records for 2010 and 2011 documented on the following facility forms:
  - NSC Form 547, entitled "Semiannual Linear Power Measuring Channel Maintenance and Surveillance," dated February 16, 2000, from February 12, 2009 to present
  - NSC Form 539, entitled "Weekly Ventilation and Scram Surveillance," dated June 30, 2009, from January 2, 2009 to present
  - NSC Form 541, entitled "Quarterly Transient Rod Drive Maintenance," dated October 4, 1999, from June 23, 2009 to present
  - NSC Form 549, entitled "Semiannual Reactor Pulse Power Surveillance," dated October 15, 1999, from December 2, 2009 to present
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- Texas A&M University NSC 2009 Annual Report, dated March 30, 2010
- Texas A&M University NSC 2010 Annual Report, dated March 30, 2011

b. Observations and Findings

In 2009 there were four unplanned scrams and in 2010 there were 22 unplanned scrams. The increase can be attributed to the loss of the senior electronics technician. A review of the reactor console and maintenance logs showed that maintenance items were being documented. This review also demonstrated that maintenance was being conducted consistent with the TS and applicable procedures. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

c. Conclusion

Maintenance was completed and documented as required.

7. Fuel Handling and Movement

a. Inspection Scope (IP 69001)

To verify adherence to TS Sections 3.1.4, 3.3.1.b, 5.1, 5.2, and 5.5, the inspectors reviewed:

- NSC Core Loading Map in the Control Room
- Fuel handling equipment and instrumentation
- NSC Reactor Operations Log Book Number 215-217, dated from May 12, 2011 to present
- Fuel bundle movement records for July 2010 and July 2011
  - NSC Form 576, entitled “LEU Fuel Log Vol. I,” dated July 18, 2008
  - NSC Form 578, entitled “LEU Fuel Log Vol. II-A In Service Element Data,” dated July 23, 2006
  - NSC Form 575, entitled “LEU Fuel Log Vol. II-B Fuel Element Elongation Data Sheets by Bundle,” dated July 23, 2006
  - NSC Form 537, entitled “NSC Fuel Loading Chart,” dated October 1, 1064

b. Observations and Findings

The inspectors reviewed selected records for the July 2010 and July 2011 core offload and reload for fuel inspection and control rod maintenance and inspection. The inspectors also verified that fuel locations were consistent with records. Records showed that TS required surveillances for refueling and fuel movement were completed to ensure controlled operations for the reactor core. All fuel movements were recorded in the reactor log and in the individual fuel element log sheets. Good correlation was noted between the fuel logs and console logs.

The inspectors observed that the data recorded for fuel was acceptable and was cross referenced in the operations logs. Log entries verified that fuel movements were completed under the direct supervision of an SRO as required. Through records review and interviews with licensee personnel, the inspectors determined

that fuel movements were conducted in accordance with TS to authorized locations. established and implemented for fuel movements as required.

c. Conclusion

The fuel handling activities and documentation were conducted in accordance with the facility TS and procedures.

8. Exit Interview

The inspectors presented the inspection results to licensee management at the conclusion of the inspection on November 3, 2011. The inspectors described the areas inspected and discussed in detail the inspection observations. No dissenting comments were received from the licensee. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

D. Reece	Director, Nuclear Science Center
J. Remlinger	Associate Director
L. Vasudevan	Radiation Safety Officer
J. Newhouse	Reactor Supervisor

INSPECTION PROCEDURES USED

IP 69001: Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-128/2011-201-1	URI	Failure to conduct operator medical evaluations within the required time frame.

Closed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
IP	Inspection Procedure
MA	Modification Authorization
MW	Megawatt
NSC	Nuclear Science Center
NSCR	Nuclear Science Center Reactor
NRC	U. S. Nuclear Regulatory Commission
PCN	Procedure Change Notice
Rev.	Revision
RSB	Reactor Safety Board
RSO	Radiological Safety Officer
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
TAMU	Texas A&M University
TEES	Texas Engineering Experiment Station
TS	Technical Specifications
URI	Unresolved Item