



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 6, 2022

MEMORANDUM TO: Andrew Waugh, Lead Inspector
Special Inspection Team

FROM: Robert M. Taylor, Deputy Director
Office of Nuclear Reactor Regulation

SUBJECT: UNIVERSITY OF TEXAS AT THE AUSTIN RESEARCH
REACTOR SPECIAL INSPECTION TEAM CHARTER

A handwritten signature in blue ink, appearing to read "Robert M. Taylor".

Signed by Taylor, Robert
on 11/06/22

You have been selected to lead a Special Inspection Team to assess the circumstances surrounding the University of Texas at Austin (UTA) research reactor operations with two, aluminum clad TRIGA fuel elements that were not licensed for use in the reactor. UTA is only licensed to operate with stainless-steel clad TRIGA fuel elements. During your inspection, you should determine what facts contributed to the loading of the aluminum clad fuel elements in the reactor core and the extent to which operating in an unanalyzed condition had impacted reactor components and reactor safety. In addition, you should determine if any reactor operations with aluminum clad fuel elements exceeded operational limits during normal and potential off-normal conditions.

The Non-Power Production and Utilization Facility (NPUF) reactive inspection guidance states that a special inspection should be considered for events that involve “operations that exceeded, or were not included in, the design bases of the facility.” Operation of the facility with aluminum clad TRIGA fuel was not evaluated for use in the UTA research reactor, and thus, is not part of the facility’s design basis. Therefore, a special inspection is appropriate. The other inspector selected for this inspection team is Craig Bassett. Additionally, the inspection team will be supplemented by Joseph Staudenmeier, Senior Reactor Systems Engineer; fuels experts from the Office of Nuclear Regulatory Research; and other experts as needed. The objectives and other details of this inspection are discussed in the enclosed Special Inspection Team Charter. The enclosed Special Inspection Team Charter was developed to provide guidance for

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this specific inspection. If you have any questions regarding the objectives or other matters related to this inspection, contact your Office of Nuclear Reactor Regulation management as specified in the enclosed charter.

Docket No.: 50-602

License No.: R-129

Enclosure:
Special Inspection Team Charter

SPECIAL INSPECTION TEAM CHARTER:
UNIVERSITY OF TEXAS AT AUSTIN RESEARCH REACTOR
ALUMINUM CLADDED FUEL ISSUE

In response to the University of Texas at Austin (UTA) research reactor operations with two, aluminum clad TRIGA fuel elements that were not licensed for use in the reactor, a Special Inspection Team (SIT) is being chartered. The purpose of this SIT is to independently assess the licensee's investigation of the causes, consequences, and corrective actions of the operation with fuel that is not authorized for use in the UTA reactor. SITs should emphasize fact finding, (i.e., fully understanding the circumstances surrounding an event), corrective actions, and probable cause(s), including conditions preceding the event, chronology, precursors, human factors considerations, quality assurance considerations, and radiological considerations. Violations identified as a result of the inspection shall be documented in accordance with applicable U.S. Nuclear Regulatory Commission (NRC) guidance.

A. Background

On October 17, 2022, UTA staff determined that aluminum clad TRIGA fuel elements stored at the facility were inadvertently placed into the reactor core and used for reactor operations from January 2022, through October 2022. In accordance with its technical specifications (TS), the UTA research reactor is only licensed to utilize stainless steel clad TRIGA fuel elements; aluminum clad TRIGA fuel elements are not authorized. UTA staff determined that as part of a core change on January 6, 2022, two aluminum clad TRIGA fuel elements were installed in the core. The aluminum clad TRIGA fuel elements were in the possession of UTA, because the elements were received along with stainless steel clad TRIGA elements as part of a 2004 fuel shipment. The fuel loading error was identified by the acting reactor manager while reviewing paperwork following the retirement of the reactor manager. Reactor operations were suspended by UTA pending an assessment of the issue and in order to implement corrective actions.

The aluminum clad elements have been removed from the core and were visually inspected. No degradation of the elements was identified.

The UTA staff is implementing the following corrective actions:

1. Revising the surveillance procedure for fuel element inspections.
2. Updating the processes to ensure that 'disqualified' fuel elements are not utilized in the core.
3. Reaching out to the National Organization for Test, Research and Training Reactor community to identify best practices for managing fuel that will not be used in the core.
4. Reviewing other procedures that satisfy TS surveillances to evaluate if they are adequate.
5. Review the event with the NRC staff.

Enclosure

The UTA staff notified the NRC inspector and project manager of the issue via telephone on October 18, 2022. At that time, the UTA staff considered the notification to be a courtesy notification only because UTA determined that none of the TS reporting requirements were met. On October 21, 2022, the NRC staff met with the licensee and advised the UTA staff to review the safety limits and limiting conditions for the operations sections in Appendix 14.1 of NUREG 1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors" considering the operations with the unauthorized fuel elements. While aluminum clad fuel elements are licensed for use in some TRIGA reactors, these reactors have more restrictive operational limits and settings than those authorized at UTA. NRC staff advised the UTA staff to confirm that operations did not violate any of the more restrictive limits that would have been in place with the aluminum clad fuel.

Prior to resuming normal operations, the UTA staff plans to:

1. Revise the surveillance procedure for fuel element inspections and submit it to the safety oversight committee for approval.
2. Perform any required fuel element inspections.
3. Load a new core configuration.
4. Conduct control rod worth calibrations.

B. Objectives

The SIT is expected to perform data gathering and fact-finding in order to address the following:

1. Assess the adequacy of the new core configuration prior to reactor restart.
2. Develop the sequence of events that lead to the loading and operations with the aluminum clad fuel elements.
3. Evaluate the licensee's response to the issue, including a determination if the issue met reporting criteria.
4. Assess the consequences, including the operating conditions and safety limits for the aluminum clad fuel elements (i.e., impacts on equipment and fuel).
5. Assess the safety significance considering the peak fuel temperature for the limiting design basis accident.
6. Assess the adequacy of facility procedures for refueling.
7. Assess the adequacy of the change management process.
8. Assess the licensee's determination of the root cause of the issue.

9. Assess the licensee's completed and planned corrective actions to ensure that all deficiencies associated with the event are adequately addressed and the corrective action will prevent any recurrence.

The team will commence the special inspection on November 7, 2022, and the inspection will include remote and onsite inspection activities. A report documenting the results of the inspection should be issued within 30 days of the completion of the inspection. While the team is onsite, you will provide daily status briefings to the management in Headquarters. The team is to emphasize fact-finding in its review of the circumstances surrounding the issue, and it is not the responsibility of the team to examine the regulatory process. The team should notify the Non-Power Production and Utilization Facility (UNPO) Branch management of any potential generic issues identified related to this issue for discussion with the TRTR community. Safety concerns that are not directly related to this event should be reported to the UNPO Branch Chief for appropriate action. The applicable guidance of NRC Manual Chapter 2545, "Research and Test Reactor Inspection Program," Inspection Procedure 93812, "Special Inspection," and MD 8.3, should be considered for this inspection.

SUBJECT: UNIVERSITY OF TEXAS AT THE AUSTIN RESEARCH REACTOR SPECIAL
INSPECTION TEAM CHARTER DATED: NOVEMBER 6, 2022

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