



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

April 21, 2021

Mr. Robert Horton, Reactor Administrator
U.S. Geological Survey
Denver Federal Center
P.O. Box 25046, MS 911
Denver, CO 80225-0046

SUBJECT: UNITED STATES GEOLOGICAL SURVEY – U.S. NUCLEAR REGULATORY
COMMISSION ROUTINE INSPECTION REPORT NO. 05000274/2020201

Dear Mr. Horton:

From November 16-19, 2020, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at your U.S. Geological Survey TRIGA Reactor facility. The enclosed report documents the inspection results, which were discussed on November 19, 2020, with you and Mr. Jonathan Wallick, Reactor Supervisor, and members of the reactor 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 inspector reviewed selected procedures and records, observed various activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the 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).

R. Horton

- 2 -

Should you have any questions concerning this inspection, please contact Craig Bassett at (240) 535-1842, or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/

Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-274
License No. R-113

Enclosure:
As stated

cc: See next page

U.S. Geological Survey

Docket No. 50-274

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Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
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COMMISSION ROUTINE INSPECTION REPORT NO. 05000274/2020201
DATED: APRIL 21, 2021

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

Docket No.: 50-274

License No.: R-113

Report No.: 05000274/2020201

Licensee: United States Geological Survey

Facility: U.S. Geological Survey TRIGA Research Reactor

Location: Building 15, Denver Federal Center
Denver, Colorado

Dates: November 16-19, 2020

Inspector: Craig Bassett

Approved by: Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

United States Geological Survey
U.S. Geological Survey TRIGA Research Reactor
Inspection Report No. 05000274/2020201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the U.S. Geological Survey (USGS, the licensee's) Class II research and test reactor safety program including: (1) organization and staffing; (2) operations logs and records; (3) procedures; (4) requalification training; (5) surveillance and limiting conditions for operation (LCOs); (6) design changes; (7) committees, audits and reviews; (8) emergency planning; (9) maintenance logs and records; and, (10) fuel handling logs and records. The U.S. Nuclear Regulatory Commission (NRC) staff determined the licensee's program was acceptably directed toward the protection of public health and safety, and in compliance with the NRC requirements.

Organization and Staffing

- The organizational structure and staffing were consistent with the requirements specified in Section 6.1 of the technical specifications (TSs).

Operations Logs and Records

- Reactor operations and logs were appropriate and completed in accordance with procedural and TS requirements.

Procedures

- The procedural control and implementation program was appropriately controlled and maintained and met TS requirements.

Requalification Training

- The requirements of the operator requalification program and regulations were met; the program was appropriately implemented; and, the program was up to date.

Surveillance and Limiting Conditions for Operation

- The licensee's program for completed surveillance checks and tests and verifying LCOs satisfied TS requirements.

Design Changes

- The licensee's design change protocol was followed and design changes were reviewed and/or evaluated in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests and experiments."

Committees, Audits and Reviews

- Audits and reviews conducted by the Reactor Operations Committee (ROC) were in accordance with the requirements specified in TS Section 6.2 and Section 3 of the Reactor Operations Manual (ROM).

Emergency Planning

- Facility emergency preparedness was maintained through implementation of the emergency plan (E-Plan) and the associated implementing procedures.

Maintenance Logs and Records

- The licensee's maintenance program was implemented as required by facility procedures.

Fuel Handling

- Fuel handling activities and documentation were as required by the TSs and facility procedures.

REPORT DETAILS

Summary of Facility Status

The USGS Training, Research, Isotopes, General Atomics (TRIGA) 1 megawatt (MW) research reactor was operated in support of USGS programs directed at improving methods and techniques to enhance scientific knowledge about water and earth materials. The reactor was also used in support of research projects from the Colorado School of Mines (CSM) and other institutions. However, as a result of past problems, the USGS TRIGA research and test reactor was currently conducting only limited operations in support of class work for CSM, to complete required surveillance and maintenance work, and to allow the operators to complete their required hours of operation and maintain their qualifications. The research reactor was placed under an administrative operational limit of 880 kilowatt as well. During the inspection, the reactor was not operated pending authorization to resume routine operations from upper management.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69001, Section 02.01)

The inspector reviewed selected aspects of the following regarding the licensee's organization and staffing to ensure that the requirements of Section 6.1 of the facility TSs, implemented as Appendix A to the Facility Operating License, No. R-113, Amendment Number (No.) 13, dated October 9, 2020, were met:

- current staff qualifications
- staffing requirements for safe operation of the facility
- organizational structure for the USGS TRIGA Reactor (GSTR) facility
- ROM, Section 3, "Nuclear Center Organization," latest revision dated March 2017
- GSTR quarterly (operations) reports for each quarter from January 1, 2019, to the present
- USGS TRIGA reactor annual report for January 1, 2018, through December 31, 2018, submitted to the NRC on January 31, 2019
- USGS TRIGA reactor annual report for January 1, 2019, through December 31, 2019, submitted to the NRC on March 2, 2020, and corrected copy submitted on April 21, 2020
- ROC meeting minutes for meetings held from October 2018 to the present
- American National Standards Institute/American Nuclear Society (ANSI/ANS)-15.4, "Selection and Training of Personnel for Research Reactors"

b. Observations and Findings

The inspector confirmed that the organizational structure and staff responsibilities, as specified in, and required by, Section 6.1 of the TSs, Section 3 of the ROM, and Figure 3.1 in the ROM, was not changed since the last NRC inspection in this area (refer to NRC Inspection Report No. 50-274/2019-201). The inspector determined that the facility remained under the direct control of the Reactor Supervisor (RS) and that the RS was

responsible to the Reactor Administrator for safe operation and maintenance of the reactor and its associated equipment as stipulated in the TSs.

Section 3.4.1 of the ROM stated that the training and qualification requirements contained in ANSI/ANS-15.4 were the minimum for the GSTR facility personnel. The inspector confirmed that the reactor staff met ANSI/ANS-15.4 education, training, and experience requirements.

The inspector noted that some staffing levels changed since the previous inspection. One person, who was appointed as the Interim RS, returned to the former position as a Nuclear Engineer. A person, who was the RS at another research reactor facility, was hired to be the GSTR RS. The inspector determined that the current operations staff was made up of the RS, the Reactor Health Physicist for the GSTR, and the Nuclear Engineer. All current staff members worked full-time at the facility and two were senior reactor operators (SROs).

c. Conclusion

The inspector determined that the licensee's organization and staffing were in compliance with the requirements outlined in TS Section 6.1 and ROM Section 3, and that staff members met the qualifications outlined in ANSI/ANS-15.4.

2. **Operations Logs and Records**

a. Inspection Scope (IP 69001, Section 02.02)

The inspector reviewed selected aspects of the following to verify operation of the reactor in accordance with TS Sections 3, 4, 5 and 6:

- daily TRIGA prestart test data sheet printouts for 2019 to the present
- ROM, Section 5, "Operating Procedures," Revision (Rev.) 5
- reactor operations logbooks Nos. 177 – 179, dated September 28, 2018, to the present
- staffing for operations as required by Section 5.2 of the ROM, Rev. 5
- selected USGS TRIGA reactor facility start-up checklists, Rev. 15, for 2019 to the present
- selected USGS TRIGA reactor facility shutdown checklists, Rev. 16, for 2019 to the present
- selected USGS TRIGA reactor facility monthly checklists, Rev. 12, for 2019 to the present
- GSTR Procedures: No. 1, "Procedure for Reactor Startup, Operation, and Shutdown," and No. 3, "Procedure for Control Rod Calibration"
- GSTR quarterly (operations) reports for each quarter from January 1, 2019, to the present
- ROC meeting minutes for meetings held from October 2018 to the present
- the two most recent USGS TRIGA reactor annual reports

b. Observations and Findings

From the records reviewed, the inspector determined that reactor operations were carried out in accordance with written procedures as required by TS Section 6.4. The inspector verified that information on the operational status of the facility was appropriately recorded in logbooks or on checklists as required by ROM Section 5. Scrams were identified in the logs and records and were reported to the RS and resolved as required by the ROM before the resumption of operations. Through interviews with operators and review of the logs, the inspector confirmed that shift staffing met the minimum requirements of at least two reactor staff members on duty whenever the reactor was operating as required by ROM Section 5.2.4.

c. Conclusion

The inspector determined that reactor operations logs and records were appropriate and completed in accordance with procedural and TS requirements.

3. Procedures

a. Inspection Scope (IP 69001, Section 02.03)

To ensure that safety standards and written instructions for those activities specified in TS Section 6.4 were in effect, the inspector reviewed selected aspects of the following:

- selected GSTR procedures
- procedural implementation by the reactor staff
- records of changes and temporary changes to procedures
- various ROM Sections including: No. 4, "Administrative Procedures," No. 5, "Operating Procedures," which contained the various GSTR procedures, and No. 8, "Radiation Protection Program"
- ROC meeting minutes for meetings held from October 2018 to the present

b. Observations and Findings

The ROM Sections and GSTR procedures provided guidance for administrative, operational, and health physics functions of the facility. The inspector confirmed that written procedures were available for those tasks and items required by TS Section 6.4. The inspector confirmed that the licensee controlled changes to procedures and the ROC conducted the review and approval process as required by the TSs.

After reviewing the 2019 and 2020 training records and interviewing staff members, the inspector determined that the training of personnel on procedures was adequate.

c. Conclusion

The inspector confirmed that the procedural control and implementation program was appropriately conducted and maintained and met TS requirements.

4. Requalification Training

a. Inspection Scope (IP 69001, Section 02.04)

To verify that the licensee complied with the requirements of their NRC-approved operator requalification program and 10 CFR Part 55, "Operators' Licenses," the inspector reviewed selected aspects of:

- operator competence evaluation and written examination records for 2017, 2018, 2019, and to date in 2020
- physical examination records documented on NRC Form 396 records
- reactor operations logbooks Nos. 177 – 179, dated September 28, 2018, to the present
- individual operator training records documented on "GSTR Reactor Operator Requalification OJT [On-the-job Training]" forms for the periods from January 2017–December 2018 and January 2019–December 2020
- Appendix 3-1 (to ROM, Section 3), entitled "Reactor Operator Requalification Program for the U.S. Geological Survey TRIGA Reactor," dated April 2014

b. Observations and Findings

There were two licensed SROs at the facility. The inspector reviewed the operators' training records and confirmed they were maintained as required by the requalification program. The records showed that the operators were knowledgeable of the appropriate subject material required by the program as demonstrated by successful completion of annual written examinations. The inspector confirmed that individual requalification records also showed that each operator demonstrated operational competence which was affirmed by the RS as required by the requalification program. The inspector further confirmed that the operators completed the required reactivity manipulations and the quarterly hours of operation required by the program. The inspector verified that the requalification training lectures were documented for the operators. The inspector verified that the operators were receiving biennial medical examinations as required by 10 CFR Part 55, Subpart C.

c. Conclusion

The inspector verified that the requirements of 10 CFR Part 55 and the operator requalification program were met; the program was appropriately implemented; and, the program was up to date.

5. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001, Section 02.05)

To verify that the surveillance program was conducted as required in TS Sections 3 and 4, the inspector reviewed selected aspects of the following:

- reactor activity calendar maintained by the RS
- surveillance, calibration, and test data sheets and related records
- reactor operations logbooks Nos. 177 – 179, dated September 28, 2018, to the present
- selected USGS TRIGA reactor facility start-up checklists, Rev. 15, for 2019 to the present
- selected USGS TRIGA reactor facility shutdown checklists, Rev. 16, for 2019 to the present
- selected USGS TRIGA reactor facility monthly checklists, Rev. 12, for 2019 to the present
- GSTR quarterly (operations) reports for each quarter from January 1, 2019, to the present
- various GSTR procedures including: No. 2, “Procedure for Reactor Power Calibration;” No. 3, “Procedure for Control Rod Calibration;” No. 7, “Procedure for Control Rod Measurement, Inspection, or Replacement;” and, No. 21, “Procedure for Measuring Control Rod Drop Time”
- ROC meeting minutes for meetings held from October 2018 to the present
- the two most recent USGS TRIGA reactor annual reports

b. Observations and Findings

The inspector reviewed selected records of TSs required checks, tests, and LCO verifications performed since January 2019. These included the daily checklists that provided documentation of withdraw prevent functions, conductivity tests, radiological safety, reactor water system and reactor ventilation system checks, as well as monthly surveillance checks of the control rod scrams, interlock functions, and building alarms. The inspector also reviewed other periodic surveillances and verifications including power calibrations, control rod inspections, and fuel elements inspections. The inspector verified that the periodic checks, tests, and LCO verifications for TS required surveillances were completed and documented as required. The inspector determined that the results of these activities were within prescribed TS limits and procedure parameters and in agreement with the previous surveillance results.

c. Conclusion

The inspector determined that the licensee’s program for surveillance checks and LCO verifications satisfied TS requirements.

6. Design Changes

a. Inspection Scope (IP 69001, Section 02.08)

In order to verify that the licensee met the design change requirements of 10 CFR 50.59 and TS Section 6.2.3, the inspector reviewed selected aspects of:

- facility configuration records
- facility design change (10 CFR 50.59) records for the past 2 years
- ROC meeting minutes for meetings held from October 2018 to the present
- ROM, Section 3, "Nuclear Center Organization," and Section 4, "Administrative Procedures"
- the two most recent USGS TRIGA reactor annual reports

b. Observations and Findings

The inspector determined that design changes at the GSTR were initiated by a facility staff review followed by a ROC review and subsequent approval of the changes if needed. The inspector determined that all staff members were familiar with the design change procedure.

The inspector noted that one facility change was proposed during the period from 2018 to the present which followed the facility design change protocol. The design change review process included a "screening" review to determine if a 10 CFR 50.59 evaluation was necessary. From the review of the proposed change, as well as through interviews with licensee personnel, the inspector determined that a 10 CFR 50.59 design change screening was completed. According to the licensee, the change was "screened-out" and did not require an evaluation using the criteria listed in 10 CFR 50.59(c)(1) and (2). However, the licensee performed an evaluation because the change involved a change to environmental monitoring as described in the safety analysis report (SAR). Through the evaluation, the licensee concluded that the change did not require a license amendment or TS change but just a change to the SAR.

c. Conclusion

The inspector determined that the licensee's design change protocol was followed and design changes were reviewed and/or evaluated in accordance with 10 CFR 50.59.

7. Committees, Audits and Reviews

a. Inspection Scope (IP 69001, Section 02.09)

In order to verify that the licensee established and conducted reviews and audits as required by TS Section 6.2, the inspector reviewed selected aspects of:

- ROC operational audits for the last 2 years
- safety review records and audit reports for the past 2 years
- ROC meeting minutes for meetings held from October 2018 to the present

- ROM, Section 3, “Nuclear Center Organization,” and Section 4, “Administrative Procedures”

b. Observations and Findings

The inspector determined that the ROC was meeting semiannually as required and committee membership satisfied TS Section 6.2.1, the ROC charter, and ROM Section 3.8 requirements. Through a review of the meeting minutes from October 2018 to the present, the inspector concluded that the committee provided guidance, direction, and oversight for the reactor and ensured proper and safe reactor operations.

The inspector verified that safety reviews and individual audits were completed at the required frequency for the functional areas specified by TS Sections 6.2.3 and 6.2.4. The inspector noted that audit topics included reactor operations, maintenance and operations logs, facility procedures, the operator requalification program, fuel movement, the radiation protection program, emergency preparedness, and the physical security plan. The inspector reviewed the results of the audits that were completed and determined that the audit findings, and licensee actions taken in response to the findings, were acceptable.

c. Conclusion

The inspector determined that audits and reviews conducted by the ROC were in accordance with the requirements specified in TS Section 6.2 and Section 3 of the ROM.

8. **Emergency Planning**

a. Inspection Scope (IP 69001, Section 02.10)

To verify compliance with the facility emergency plan entitled, “Emergency Plan for the U.S. Geological Survey TRIGA Reactor Facility,” Rev. 17, dated October 2019, the inspector reviewed selected aspects of:

- training records for the past 2 years
- emergency drills and critiques for 2018 and 2019
- GSTR emergency call list, last updated March 2019
- offsite support agreement and related information
- emergency response facilities, supplies, equipment, and instrumentation
- E-Plan implementing procedures contained in ROM Section 7, “Emergency Procedures,” revision dated October 2017

b. Observations and Findings

The inspector verified that the E-Plan in use at the facility was the same as the version most recently submitted to the NRC. The E-Plan was audited and reviewed at least biennially (typically done annually) by the ROC as required by

TS Section 6.2.4. The implementing procedures were reviewed and revised as needed.

The inspector verified that annual evacuation drills, and biennial emergency exercises were conducted as required by the E-Plan. The inspector found that critiques were held following the drills and exercises and strengths, as well as areas for improvement, were identified and discussed. The inspector determined that the emergency equipment and portable detection instrumentation listed in the emergency procedures were available and tested and maintained as required by the E-Plan and various GSTR procedures.

The inspector reviewed the letter of agreement (LOA) that was established with the offsite medical support organization, St. Anthony Lakewood Hospital. The LOA was required by the E-Plan to be updated biennially. The most recent version was dated June 17, 2019, which indicated that the hospital would assist in case of medical emergencies.

Through reviews of training records and interviews with GSTR personnel, the inspector confirmed that emergency response review and training was completed as required by the E-Plan and the Operator Requalification Plan. Emergency responders were knowledgeable of the proper actions to take in case of an emergency. Fire Department personnel were trained biennially as required by the plan.

The E-Plan also required the reactor staff personnel to contact the local Department of Energy (DOE) Radiological Assistance Program team and verify their contact information. The inspector verified that this was done as required. In addition, the facility emergency call list was required to be reviewed and updated at least biennially. The call list was updated in March 2019.

c. Conclusion

The inspector determined that facility emergency preparedness was maintained through implementation of the E-Plan and the associated implementing procedures.

9. Maintenance Logs and Records

a. Inspection Scope (IP 69001, Section 02.11)

To verify that the maintenance program was conducted as required in TS Sections 3, 4 and 5, the inspector reviewed selected aspects of:

- USGS TRIGA reactor maintenance log
- various GSTR procedures including: No. 12, "Procedure for Changing Demineralizer Resin;" No. 13, "Procedure for Use of Leak Testing Device;" and, No. 19, "Procedure for Test Equipment Calibration"
- facility design change (10 CFR 50.59) records for the past 2 years
- the two most recent USGS TRIGA reactor annual reports

b. Observations and Findings

The inspector reviewed selected maintenance guidance documents and records, including the maintenance log. This log was used effectively to document detailed maintenance activities completed on specific items of equipment including the primary and secondary pumps, exhaust fans, the cooling tower, and electronic equipment. The records reviewed indicated that routine and preventive maintenance was controlled, conducted, and documented in the maintenance or operations log consistent with licensee procedures. Verifications and operational systems checks were performed to ensure system operability before an item of equipment, or a system was returned to service. Unscheduled maintenance or repairs were reviewed to determine if the situation required a 10 CFR 50.59 evaluation.

c. Conclusion

The inspector determined that the licensee's maintenance program was implemented as required by GSTR procedures

10. Fuel Handling

a. Inspection Scope (IP 69001, Section 02.12)

To verify that reactor fuel was handled, moved, inspected, and stored in compliance with TS Sections 4.1, 5.3, and 5.4, the inspector reviewed selected aspects of the following:

- fuel handling equipment and instrumentation
- fuel element location board maintained in the reactor room
- GSTR fuel books containing the various USGS TRIGA reactor fuel element history sheets for all the elements at the facility, fuel movement sheets, and fuel inspection forms and information
- reactor operations logbooks Nos. 177 – 179, dated September 28, 2018, to the present
- various GSTR procedures including: No. 4, "Procedure for Fuel Loading and Unloading;" No. 8, "Procedure for Measuring Fuel Elements;" No. 9, "Procedure for Locating Fuel Element Cladding Failure;" No. 25, "Procedure for Visual Verification of (1) Aluminum-Clad Fuel Element Locations and (2) number of Fuel Elements in Reactor Core;" and, No. 30, "Procedure to Rotate Aluminum Fuel"
- GSTR quarterly (operations) reports for each quarter from January 1, 2019, to the present
- ROC meeting minutes for meetings held from October 2018 to the present

b. Observations and Findings

The inspector reviewed fuel handling at the facility and found that procedures were in place and fuel logs and inspection records were maintained. Through review of the fuel movement and inspection records and interviews with operations staff, the inspector verified that fuel was moved and controlled

according to established procedure. The inspector determined that fuel movements were planned, and a written sequence developed prior to completing the actual transfers and were documented in the console logbook and appropriate fuel logbook. The inspector verified that the fuel was inspected every 5 years as required by TS 4.1.8. The inspector also verified that fuel was stored in the locations indicated by licensee records and as required in TS Sections 5.3 and 5.4.

c. Conclusion

The inspector determined that fuel handling activities and the documentation thereof were acceptable and in accordance with procedural and TS requirements.

12. Follow-up on a Previously Identified Unresolved Item

a. Inspection Scope (IP 92701)

The inspector reviewed the following previously identified item:

- 50-274/2018-202-01 – unresolved item (URI) – review the adequacy of the licensee’s 10 CFR 50.59 review concerning movement of the lightly used fuel acquired from DOE and placing some of the elements into the core.

b. Observations and Findings

During a previous inspection, the inspector reviewed a 10 CFR 50.59 design change review which involved relocating fuel elements within the reactor core and adding additional fuel elements to the reactor core. The licensee completed a screening form for the proposed change which indicated that the fuel movement and addition to the core “screened-out.” Therefore, the issue did not require any further evaluation in accordance with the criteria of 10 CFR 50.59.

However, the licensee’s screening review indicated that the primary document used for the review was the safety evaluation report (SER) that was written by the NRC to support the 2016 USGS license renewal review. The licensee indicated that they completed a separate Monte Carlo N-Particle Transport (MCNP) code calculation before replacing some of the fuel elements in the core with “lightly used” elements acquired from the DOE Idaho National Laboratory (INL). Despite doing their own MCNP calculations, the licensee relied on the information and conclusions in the SER in reaching their conclusion that no further evaluations were needed before loading the lightly used fuel into their core. It was not clear to the inspector how a proposed facility change (i.e., core reconfiguration) that “screened-out” would need to be supported by new or additional MCNP analyses. Furthermore, the inspector observed that the ROC did not agree with the 10 CFR 50.59 screening by indicating that the licensee’s SAR did not align with the NRC SER. Also, the ROC, and the inspector had questions about the thermo-hydraulic analysis for the limiting core configuration. Because of these issues, the NRC questioned whether the licensee’s screening of the fuel move and addition to the core constituted a sufficient review by the licensee and found that further evaluation was needed.

During this inspection, the URI was reviewed. The inspector determined that the licensee anticipates receiving more “used” fuel from a research reactor in Finland. The licensee will then perform more MCNP analyses to include the use of that used fuel, the lightly used fuel received from INL, and the fuel they currently possess. The licensee then plans on writing a License Amendment Request which would allow them to use any of the fuel and resume operations at their licensed power level of 1 MW. This issue remains open.

c. Conclusion

The inspector determined that the URI concerning a 10 CFR 50.59 design change review which involved relocating fuel elements within the reactor core and adding additional fuel elements to the reactor core remains open.

12. Exit Meeting Summary

The inspector reviewed the inspection results with members of licensee management at the conclusion of the inspection on November 19, 2019. 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

Licensee Personnel

| | |
|------------|--|
| C. Farwell | Nuclear Engineer and Senior Reactor Operator |
| R. Horton | Reactor Administrator |
| C. Manning | Reactor Health Physicist and Senior Reactor Operator |
| J. Wallick | Reactor Supervisor |

Other Personnel

| | |
|--------------|--|
| J. McConaghy | Captain/Paramedic, West Metro Fire Protection District, Station 5A, Denver, Colorado |
|--------------|--|

INSPECTION PROCEDURE (IP) USED

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| IP 69001 | Class II Research and Test Reactors |
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ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

| | | |
|--------------------|-----|--|
| 50-274/2018-202-01 | URI | Review the adequacy of the licensee's 10 CFR 50.59 review concerning movement of the lightly used fuel acquired from DOE and placing some of the elements into the core. |
|--------------------|-----|--|

Closed

None

PARTIAL LIST OF ACRONYMS USED

| | |
|----------|--|
| 10 CFR | Title 10 of the <i>Code of Federal Regulations</i> |
| ANSI/ANS | American National Standards Institute/American Nuclear Society |
| CSM | Colorado School of Mines |
| DOE | Department of Energy |
| GSTR | (United States) Geological Survey TRIGA Reactor |
| INL | Idaho National Laboratory |
| IP | Inspection Procedure |
| LCO | Limiting Conditions for Operation |
| LOA | Letter of Agreement |
| MCNP | Monte Carlo N-Particle Transport (code) |
| MW | Megawatt |
| No. | Number |

| | |
|-------|---|
| NRC | U.S. Nuclear Regulatory Commission |
| Rev. | Revision |
| ROC | Reactor Operations Committee |
| ROM | Reactor Operations Manual |
| RS | Reactor Supervisor |
| SAR | Safety Analysis Report |
| SER | Safety Evaluation Report |
| SRO | Senior Reactor Operator |
| TRIGA | Training, Research, Isotopes, General Atomics |
| TS | Technical Specification |
| URI | Unresolved Item |
| USGS | United States Geological Survey |