

In This Edition

Message From The Chair	2
News	3
Events	5
NRC Inspections	6
RRFM 2024 Summary	8
Reportable Occurrences	9
NEUP Grant Awards	10
Quarterly Public Meeting	12
Licensing Updates	13
OIG Audit Class II Program	13
NEIMA Review Times	14

Message from the Chair

The TRTR Executive Committee has been extraordinarily busy this year responding to a variety of topics, more than just the regulatory world. What is going on? Topics include, but are not limited to:

- The <u>TRTR Annual Meeting</u> will be held September 29 through October 3, 2024, at the <u>Marriott Pyra-</u> <u>mid</u> in Albuquerque, NM. The call for <u>abstracts</u> is already out. Looking forward to seeing everyone there!
- NRC Commission Vote on the Non-Power and Utilization Facility (NPUF) Rule - This rule would do a number of things, the two most significant being: (1) removes 20-year license renewal and moves to establishing non-expiring licenses; and (2) establishes a 1 Rem emergency dose limit. Voting on this rule is long overdue. This has been the subject of numerous NRC Commissioner visits over the last five years as well as a strongly worded letter recently submitted to the NRC Commission requesting that they move on the vote. This rule is particularly important for the TRTR community in light of the fact that a bolus of license renewals will be due in the next few years. Status of NUREG-1537 Update - NUREG-1537 provides guidance on the structure of license submittals and the safety analysis report. The NRC has a revised version of this document waiting in the





Steve Reese Executive Committee Chair

Amber Johnson, Editor University of Maryland

wings. It is delayed by the commission vote on the NPUF rule as it is oriented towards reviews rather than license renewals.

Status of NUREG-1478 Update - NUREG-1478 provides guidance on the process of administering reactor operator exams. This is long overdue on the part of the NRC. When this is released for public comment, I would ask everyone to give it a good read and provide comments. We'll do our best to get the word out when it does get released. Engagement with U.S. DOE Office of Nuclear Energy – We had the pleasure of meeting with Assistant Secretary Dr. Huff as well as Deputy Assistant Secretary Dr. Goff to discuss reactor infrastructure grants as well as the state of the TRTR reactor fleet. We have also followed up with a comment letter addressing the Request for Information that was announced by that office. As you are probably aware Dr. Huff has recently resigned to return to her faculty position at the University of Illinois and Dr. Goff is the current Acting Assistant Secretary. Maintaining an open dialogue for information sharing with the Office of Nuclear Energy should always be a high priority for the TRTR community. Potential for Operator Examinations by Licensees - A sub-committee was established to evaluate

- the potential for facilities to proctor their own reactor operator license examinations. A report on the recommended path forward will be presented to the TRTR Executive Committee at the annual meeting.
- We have dealt with a constant stream of emergent issues such as providing technical assistance to facilities dealing with a leaking primary tank, discussing regulatory issues surrounding operator examination/requalification, and discussion

of the NRC Office of Inspector General report on NRC research and test reactor inspections...just to name a few.

I can't express my appreciation for all that have been contributing to these efforts over the past year...or more in many cases. I am exceedingly grateful for all the work that has been put in to make the community a better place.

Steve Reese Director, Radiation Center Associate Professor, School of Nuclear Science and Engineering

<u>Alyssa Spence Named Chief</u> <u>Operator for ATRC Facility</u>

Alyssa Spence has been named chief operator of the Advanced Test Reactor Critical at INL.

Imperial College Research Reactor Completely Decommissioned

The Imperial College Reactor Centre has become the first reactor site in the UK to be completely decommissioned and the site released. The reactor was the UK's last civilian research reactor when it was shut down in 2012.

<u>Oklo and Argonne National Lab</u> <u>Collaborate on Testing</u>

Advanced nuclear company Oklo said it has successfully completed the second phase of the Thermal Hydraulic Experimental Test Article (THETA) testing campaign in collaboration with Argonne National Laboratory. The THETA testing campaign is focused on the key thermal-hydraulic behavior of Oklo's fast fission reactor design.

<u>Penn State Receives Small An-</u> <u>gle Neutron Scattering Equip-</u> <u>ment</u>

The Penn State Radiation Science and Engineering Center (RSEC) recently received a small angle neutron scattering (SANS) device donated by the Helmholtz Zentrum Berlin (HZB) in Germany. The Penn State Breazeale Reactor will be the only US University Research Reactor with a SANS capability.

X-Energy Opens Plant Support Center

X-Energy has opened its Plant Support Center which will serve as the first training center for its Reactor Operators. The 10,000 square foot stateof-the-art facility includes a full-scale plant control room simulator, Reactor Protection System prototype, and virtual reality experience, as well as offices and classrooms.

IAEA Conducts Operation and Maintenance Assessment at Brazil's IEA-R1 Research Reactor

An IAEA-led team performed Operation and Maintenance Assessment for Research Reactors (OMARR) mission at the IEA-R1 research reactor in Brazil. The mission aimed to help improve operational and maintenance practices at the 5 MW pool type reactor; several recommendations including enhancing communication of goals, plans and activities as well as providing staff training on the plant's quality assurance manual, were provided.

<u>University of Wyoming Re-</u> <u>search Reactor</u>

The University of Wyoming once ran a 10 W L-77 aqueous homogeneous reactor from Atomics International. The reactor was decommissioned in the 1970s.

KAERI Tests High-density Research Reactor Fuel

A plate-type uranium silicide fuel, with a high uranium density designed for research reactors, has successfully completed irradiation tests at the BR-2 reactor in Belgium. The uranium density of the test fuel is 5.3 grams per cubic centimeter, which is about 10% higher than that of current fuel in use.



First Research Reactor

The Nuclear Power and Energy Agency (NuPEA), the State agency leading the country's nuclear power program, says that it will require at least Ksh11 billion (about \$83 million) to develop the country's first research reactor.

<u>Ünlü Recognized at Penn State</u> University

Kenan Ünlü, the director of the Penn State Radiation Science and Engineering Center, was awarded the 2024 President's Award for Excellence in Academic Integration for extraordinary achievement in the integration of teaching, research or creative accomplishment and service.

U.S. and Japan Remove all HEU from Research Reactors

The HEU fuel at the Kyoto University Critical Assembly and Kindai University Teaching and Research Reactor has been removed and replaced with HALEU fuel. These were the last remaining research reactors in Japan fueled with HEU.

Office of Nuclear Energy Releases Report to Congress

The Office of Nuclear Energy has released a report to Congress titled, 'Needs for University Nuclear Reactor Refurbishments, Upgrades, and New Reactors'. The report describes the state of research reactors at U.S. universities, advanced reactor research and workforce development needs, and preliminary planning information for establishing new advanced university research reactors.

ANSTO Upgrades Cold Source

ANSTO has recently shut down the OPAL multipurpose reactor to upgrade the cold neutron source.

Production to Begin for German **Research Reactor Fuel**

Framatome and Germany's Technical University of Munich (TUM) have agreed to develop a process to manufacture monolithic molybdenum-uranium (U-Mo) fuel for the university's FRM II research reactor. This will enable the conversion of FRM-II to LEU.

Kenya Plans to Spend \$83m on INSARR Mission Completed at **TU Delft**

The IAEA completed a follow-up Integrated Safety Assessment of Research Reactors (INSARR) mission at the TU Delft Reactor Institute to assess the implementation of the recommendations made in a previous review in September 2021.

MARIA Reactor to be Modernized

The Polish government has adopted a resolution on the project to modernize the MARIA nuclear research reactor. The multi-year program will cost around \$20 million and allow the reactor to continue operating beyond 2027.

UMass Lowell Nuclear Art Contest

The UMass Lowell Radiation Safety Office, Department of Physics and Applied Physics, and Department of Art & Design held a radiation-themed sculpture contest won by Kara Cormier.

NRC Completes Environmental Assessment of ACU NEXT Lab

The NRC has completed its environmental assessment of the Molten Salt Research Reactor proposed at Abilene Christian University with a finding of no significant impact.

New LEU Fuels for Research **Reactors Qualified**

The NNSA's Office of Material Management and Minimization has worked to develop new fuel types for the conversion of research reactors from HEU to LEU. New uranium-molybdenum monolithic fuels are in the final stages of fuel demonstrations before applying for regulatory approval for use.

Low Intensity Test Reactor Demolished

The Low Intensity Test Reactor at Oak Ridge National Lab has been demolished, and the waste shipped for disposal.

UMass Lowell Radiation Safety and Control Course

UMass Lowell offers a Radiation Safety and Control course which makes use of the UMass Lowell Research Reactor.

Purdue University Chosen to Review Small Modular Reactors

Purdue University has been selected by the Indiana Office of Energy to research small modular nuclear reactor deployments in the state of Indiana.

<u>Aalo Atomics Signs MOU with</u> DOE

Aalo Atomics, a new microreactor company, has signed an MOU with the Department of Energy to site the Aalo-1 reactor, a proposed 10 MWe sodium-cooled, UZrH-fueled reactor, at the Central Facilities Area in Idaho National Laboratory.

UC Irvine Reactor Used for Ac-225 Development Research

The UC Irvine TRIGA Reactor was used for the development of new technique to produce Ac-225, a promising isotope for new radiopharmaceuticals.

Oklo and Atomic Alchemy to Collaborate on Isotope Production

Oklo and Atomic Alchemy are forming a strategic partnership to produce radioisotopes from Oklo's recycling process and through fast reactor production of isotopes.

Spending cuts imperil Argentina's new Reactors

Budget shortfalls at the National Commission of Atomic Energy threaten the completion of the RA-10 Research Reactor and CAREM Small Modular reactor in Argentina. The RA-10 reactor is 85% complete.

Events

U.S. Women in Nuclear Conference

July 22-25, 2024 Pittsburgh, Pennsylvania

TRTR Annual Meeting

September 29 – October 3, 2024 Albuquerque, New Mexico

International Conference on Research

Reactors November 11-15, 2024 Vienna, Austria

ANS Winter Conference and Expo

November 17-21, 2024 Orlando, Florida

Conference on Nuclear Training and

Education February 3–6, 2025 Amelia Island, Florida

European Research Reactor Conference

April 6-10, 2025 Aix-en-Provence, France

International Symposium on Reactor

Dosimetry May 18-23, 2025 Charleston, South Carolina

22nd IGORR Meeting

June 15-19, 2025 Mito, Japan



NRC Inspections

University of California -Davis

Rhode Island **Atomic Energy** Commission

Jan 22 - 25, 2024

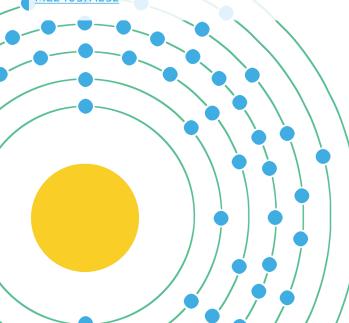
The inspection included a review of organization and staffing, operations logs and records, procedures, requalification training, surveillance and limiting conditions for operation (LCOs), design changes, committees, audits and reviews, maintenance logs and records, and fuel handling logs and records. No violations were identified. An inspection follow up item for a TRIGA fuel element which failed to pass visual inspection was closed out. ML24032A029

University of California -Irvine

Feb 5-8, 2024

The inspection included a review of organization and staffing, operations logs and records, requalification training, surveillance and limiting conditions for operation (LCO), emergency planning, maintenance logs and records, and fuel handling logs and records. No violations were identified.

ML24057A252



Feb 26-29, 2024

The inspection included a review of effluent and environmental monitoring, organization and operations and maintenance activities, review and audit and design change functions, emergency preparedness, radiation protection, and transportation activities. No violations were identified. An inspection follow up item for an extremity shallow dose exposure potentially exceeding 10 CFR Part 20 limits was closed out. ML24073A315

GE-Hitachi Nuclear Energy

Oct 16 - Nov 24, 2023 April 29 - May 2, 2024

The inspection included licensed activities at the Vallecitos Boiling Water Reactor (VBWR); General Electric Test Reactor (GETR); and Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor (EVESR). One Severity Level IV violation was identified for a failure to list the maximum activity of radioactive contents contained in each package during transport, but is being treated as a non-cited violation. ML23362A083

The inspection included licensed activities at the Vallecitos Boiling Water Reactor (VBWR); General Electric Test Reactor (GETR); and Empire State Atomic **Development Associates Incorporated Vallecitos** Experimental Superheat Reactor (EVESR). No violations were identified. ML24143A190

North Carolina State University

Feb 12-15, 2024

The inspection included a review of procedures, experiments, health physics (HP), design changes, committees, audits, and review, and transportation activities. A minor violation was identified for a failure of a required power monitoring channel during operations. The issue was promptly corrected and the violation is not being cited.

ML24066A004

Oregon State University

March 4-7, 2024

The inspection included a review of organization and staffing, operations logs and records, requalification training, surveillance and limiting conditions for operation (LCO), experiments, emergency planning, maintenance logs and records, and fuel handling logs and records. One Severity Level IV violation was identified for an operator error leading to the reactor exceeding its maximum licensed power level in square wave operations. The violation is not being cited. An unresolved item was opened to demonstrate compliance with fuel inspection requirements. ML24079A184

Reed College

March 25-27, 2024

The inspection included a review of procedures, health physics (HP), design changes, committees, audits and reviews, and transportation activities. No violations were identified.

ML24106A164

Washington State University

March 18 - 21, 2024

The inspection included a review of organization and staffing, procedures, health physics, design changes, committees, audits and reviews, emergency planning, and transportation activities. No violations were identified. One Inspection Follow-up Item (IFI) was closed for a required update to an experimental procedure. A second IFI remains open for pending updates to an administrative procedure. ML24100A794

Dow Chemical Company

April 9–11, 2024

The inspection included a review of organization and staffing, operations logs and records, procedures, requalification training, surveillance and limiting conditions for operation (LCOs), committees, audits and reviews, maintenance logs and records and fuel handling logs and records. No violations were identified.

ML24121A085

Ohio State University

March 25-28, 2024

PAGE 7

The inspection included a review of organization and staffing, operations logs and records, regualification training, surveillance and limiting conditions for operation (LCO), emergency planning, maintenance logs and records, and fuel handling logs and records. No violations were identified. ML24106A035

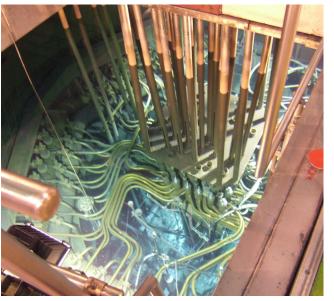


RRFM 2024

The European Research Reactor Conference was hosted by the European Nuclear Society and the Polish Ministry of Science and Higher Education from April 22st – 25th in Warsaw, Poland with approximately 200 participants. The meeting included sessions on the role of research reactors in advancing nuclear power, safety and security, reactor utilization, innovative methods, operations and maintenance, new reactors, decommissioning, and research reactor fuels. The conference proceedings are available for download here. The conference also included a student poster competition, which was won by Federico Di Croce for "Neutronic Experiments at VENUS-F in Support of Lead Cooled SMR Development"

The meeting included technical tours at the <u>Nation-</u> <u>al Centre For Nuclear Research</u> including the <u>MARIA</u> <u>Research Reactor</u>, <u>Radioisotope Centre POLATOM</u>, and Materials Research Laboratory.

The next RRFM meeting will be held from <u>April 6-10</u>, <u>2025 in Aix-en-Provence, France</u>.



MARIA reactor, picture courtesy of Les Foyto



Above: View of the room from the speaker's podium Right: Maire Curie statue



NRC Inspections -Continued

Texas A&M University

Dec 11-14, 2023 Jan 9-11, 2024

The inspection included a review of security compliance. **Two Severity Level IV violations were identified.** ML23356A117

The inspection included a review of operations logs and records, requalification training, surveillance and limiting conditions for operation (LCO), experiments, emergency planning, maintenance logs and records, and fuel handling logs and records. One Severity Level IV violation is being cited for failure to notify the NRC of changes in the medical status of 2 operators, and allowing them to continue operating. An additional non-cited violation was identified for the failure of a required radiation monitor in the Emergency Support **Center.** Three Inspection Follow-up Items were identified for failing to provide a written report to the NRC within 14 days of a Reportable Occurrence on two occasions and failure to conduct an Emergency Drill in the required time period. One Unresolved Item was identified for failure to calibrate air monitors at the required frequency. ML24024A132

Reportable Occurrences

- The Reed Research Reactor had a Reportable Occurrence on March 7, 2024 (Event # 57014) when the reactor key was left in the console unattended for approximately 20 minutes following a planned shutdown.
- The Oregon State University TRIGA Reactor had a Reportable Occurrence on May 7, 2024 (Event **#** 57113) due to a violation of minimum staffing requirements; following a reactor shutdown, there was an indication that one control rod was not fully inserted. Both the reactor operator and reactor engineer left the control room to investigate, leaving it unattended, and discovered that one control rod was not fully inserted meaning that the reactor was not secured. This was found to be due to a broken plastic component in the control rod barrel. A follow-up report (ML24145A126) was issued on May 21, 2024; the broken seat was replaced, and operators were reminded of the proper actions to take in such occurrences. An additional surveillance to check the condition of the seats will be added to the control rod inspections.
- The Missouri University Research Reactor had a Reportable Occurrence on May 10, 2024 [Event # 57125] when the Tech Spec required filter monitors were not positioned on the correct filter banks. There is no evidence of any radioactive material release. MURR provided a follow-up report on May 23, 2024 [ML24145A182] stating that the cause of the issue was an inadequacy in procedures, and that there were no adverse consequences. The relevant procedures will be updated.



2024 NEUP Grant Awards: Research Reactor Infrastructure Awards

Kansas State University \$175,153.00

Replace and upgrade cooling system components to increase operational reliability. [More]

Penn State University \$177,409.00

Acquisition of a new console uninterruptible power supply, an ultrapure water source for radiochemistry, a digital signal analyzer for the emergency operations center HPGe detector, a new ion exchange vessel for the primary water system, and new in-core and beamline detectors for the rapid and repeatable measurement of neutron flux. [More]

Rhode Island Nuclear Science Center \$124,615.00

Acquire a complete gamma spectroscopy system. [More]

University of Massachusetts, Lowell \$598,075.00

Replace the 2 existing Linear Power monitoring Safety Channels amplifiers. [More]

University of Missouri, Columbia \$378,255.00

Upgrade the MU Research Reactor's facility access control system to a more secure system to maintain facility protection and to meet increased demands from faculty and student researchers authorized to use various areas of the MURR facility. [More]

University of New Mexico \$437,995.00

Replace aging and degraded hardware in the UNM AGN-201M nuclear reactor, including original power supplies and reactor safety logic systems, improving reactor safety and reliability. [More]

University of Utah \$96,440.00

Upgrades to the Continuous Air Monitor, and addition of a new Source Range Channel. [More]

Washington State University \$365,195.00

Replace the 62-year old obsolete overhead crane and add an underwater pool illumination system. [More]

2024 NEUP Grant Awards: Reactor Sharing

Ohio State University Virginia Commonwealth University & University of

Michigan

Expand its nuclear education capabilities, while exposing more students beyond the state of Ohio, to the research and testing at the Nuclear Reactor Laboratory (NRL), as well as the field of nuclear science and engineering. [More]

Purdue University Virginia Commonwealth University, University of Illinois -Urbana Champaign, & University

of Notre Dame

Provide reactor access to three universities from three different states: UIUC, Notre Dame, and VCU, host annual "Reactor Day" events, increase the number of reactor tours, establish an annual 2-day science teacher workshop, and develop a new 1 credit-hour inperson certificate course on Nuclear Reactor Operation and Control. [More]

University of Florida University of Puerto Rico at Mayagüez, Florida International University, & University of Central Florida

Offering a Reactor Sharing Program at the University of Florida Training Reactor (UFTR) to participating User Institutions and K-12 organizations. The overall goal of the project is to cultivate a robust, diverse next-generation nuclear workforce through a program tailored to each participating group. [More]

University of Maryland, College Park

Morgan State University & American Nuclear Society

Increase the access to, and usage of, the facilities by students and teachers who come from traditionally underrepresented communities through our Engineering at Maryland by Providing Opportunities With Research Reactor (EMPOWRR) program. [More]

University of Texas - Austin Austin Community College

Fast track several aspects of outreach activities in nuclear science and engineering encompassing research reactor tours to disadvantaged communities and Austin Community College, and to offer research opportunities to high school and undergraduate students. [More]

University of New Mexico American Nuclear Society

Improve and democratize public awareness, educational opportunities, and understanding of nuclear science, engineering, and technology in the Southwest, particularly among underrepresented and disadvantaged communities. [More]

Continued on page 12

Reactor Sharing Continued Texas A&M University -College Station Prairie View A&M University, & Texas A&M University -

Kingsville

Support on-going efforts to improve public awareness and understanding of nuclear science, engineering, and technology, increase the quantity and quality of collaborations amongst faculty and students while also strengthening the partner user institutions' nuclear science and engineering instruction. [More]

The DOE Nuclear Energy University Program made 8 awards totaling more than \$2.35 million for research reactor infrastructure upgrades in 2024. An additional 7 awards, each for \$200,000, were made under the DOE's new University Reactor Sharing and Outreach program. Total funding for research reactor programs was slightly more than in 2023 with over \$3.75 million being awarded.

Purdue University \$6 million Massachusetts Institute of Technology, North Carolina State University, Ivy Tech Community College, and Tougaloo College Research and Development Foundation

Establish cutting-edge cyber-physical capabilities for Small Modular Reactor (SMR) and Advanced Reactor (AR) technologies including reactor simulators and digital twins. [More]

NRC Public Meeting

The NRC-TRTR quarterly public meeting was held on June 3rd on Microsoft Teams. The meeting included information on the recent issuance of Revision 1 to Reg Guide 5.87 which describes the new suspicious activity reporting requirements of 10 CFR 73.1215. Revision 1 addresses most licensee comments on the new rule except for those related to the requirement to FAA control towers to report specific aircraft activity. Many licensees requested a change in the language to allow for contacting a more appropriate FAA office, but this will require a rulemaking. Licensees may apply for an exemption from 10 CFR 73.1215(a) if they feel it is necessary, an example exemption request is available here (ML23334A246). Many power reactors have received such exemptions. The NRC is also working on updates to Reg Guide 5.62 and NUREG 1304 which describe reporting of safeguards events. When the updates are completed, the NRC will host 2 workshops to discuss the implementation, likely in 2025.

Working on revisions to <u>Inspection Manual 0615</u> on the guidance for writing Inspection Reports; reports will be switching to an automatically generated format, likely in October 2024 Only 2 full time Examiners in the branch, so the NRC is requesting timely submission of exam related documents to help maintain the exam schedule

3 additional Examiners are currently in training

Reminder that there are separate EIE systems One for operator licensing documents under 10 CFR 55

One for reactor licensing documents under 10 CFR 50

Updates to NUREG 1478 and 1537 are ongoing FSAR updates will be required

NPUF Rule remains under consideration by the Commissioners

Josh Borromeo is no longer the Branch Chief of the Non-Power Production and Utilization Facility Licensing Branch

Licensing Updates

Idaho State University

The NRC states it expects to complete its review of the License Amendment Request submitted in February 2023 (ML23074A066) to modify scram channel requirements by June 2024 (ML24115A090).

NC State University

NC State is withdrawing (ML24010A219) its License Amendment Request (ML23212A973) from July 2023 to modify the technical specifications regarding reportable events. The NRC has ceased its review (ML24080A260).

Oregon State University

Oregon State University provided additional information (ML24089A118) to the NRC regarding its License Amendment Request (ML24052A143) to remove the Square Wave mode of operation.

Washington State University

Washington State University provided updated draft Technical Specifications (ML24054A198) for their License Amendment Request to change the definition of the facility submitted in August 2023 (ML23220A386).

University of Utah

University of Utah is requesting a temporary exemption (ML24088A015) from several of the requirements of 10 CFR 55.53 and 55.59 in order to maintain operator proficiency during an extended shutdown for reactor tank repairs. The NRC held a public meeting to discuss the exemption request on May 17, 2024 (ML24124A083)

Kansas State University

Kansas State University is requesting a temporary exemption (ML24085A808) from several requirements of 10 CFR 55.59 while they address fuel issues. KSU proposes to have at least one operator demonstrate proficiency at the University of Texas -Austin TRIGA reactor prior to restart.

Audit of the U.S. Nuclear Regulatory Commission's Safety Inspections of Class II Research and Test Reactors

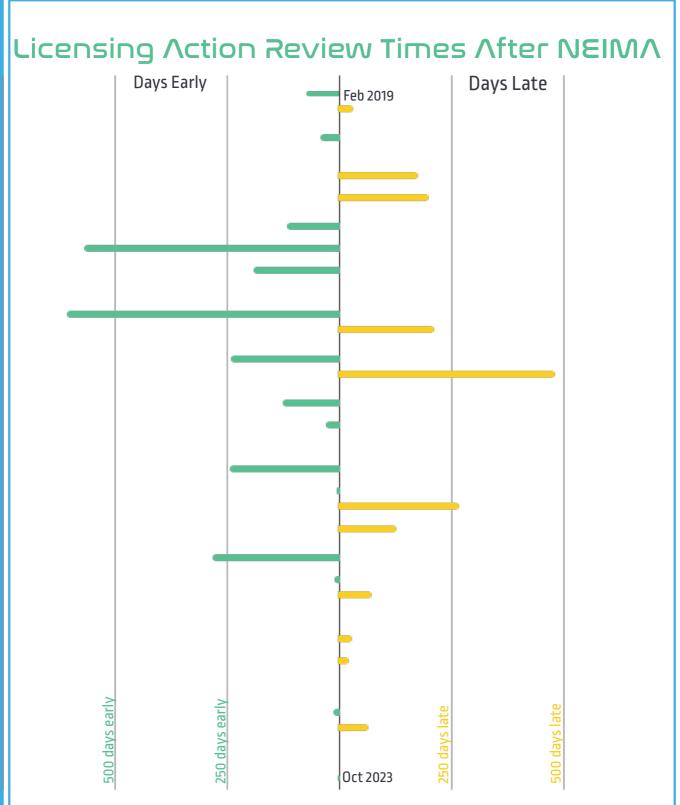
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The Office of the Inspector General performed an audit (OIG-24-A-07) to determine whether the NRC performs safety inspections at Class II RTRs in accordance with agency guidance and inspection program objectives. The audit found that:

- · RTR inspection hours were not accurately charged
- NRC does not consistently track post-qualification
- and refresher training requirements
- NRC does not take a consistent approach in reviewing requests to approve alternate methods for meeting inspector qualification requirements
- NRC does not centrally retain RTR inspection program information and has not periodically reviewed RTR inspection program guidance as required

The NRC has released responses (ML24151A539) to the findings of the audit and intends to implement all corrective actions by the end of Calendar Year 2024.





The <u>Nuclear Energy Innovation and Modernization Act</u> (NEIMA), issued in 2019, directed the NRC to provide performance metrics and milestones schedules for activities requested by licensees. Since NEIMA was issued, research reactor licensees have requested 32 license amendments. The NRC has provided estimated review times for 25 of these (the other license amendments were issued within a few weeks of being requested). The average review time for the remaining LARs has been 34 days less than the estimated timelines.