NEWSLETTER

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Q3 2024

TRTR CHAIR

Steve Reese

Director, Radiation Center
Associate Professor, School of Nuclear Science and Engineering
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Dear Community,

The TRTR annual meeting in Albuquerque is fast approaching and I can't believe a year has gone by… and fast. Working with the folks at Sandia National Laboratory has truly been a pleasure. The meeting that they are putting together looks to be exciting! At this meeting I'm really looking forward to hearing about the ramifications of the ADVANCE Act that Congress passed this year. The Act passed with wide bipartisan support with the intent of supporting the development/deployment of new advanced reactors and to facilitate a look at, and resources available for, regulation in support efforts to license new nuclear technologies. Additionally, I'm really excited to hear more about the new advanced reactors that are being designed and built. If you noticed, the number of presentations at the annual meeting involving these types of projects has been steadily increasing over the last few years. This year will not disappoint, particularly as construction has started on three new reactors. We often kid each other about the number of "paper reactors" there are…not anymore. In conclusion, I would like to say that it has been my absolute honor and pleasure to serve as the Chair of TRTR this year. As my time as Chair is rapidly coming to an end, there are several people

that I would like to thank for their input and council. First and foremost are the folks on the executive committee. I can't underscore the importance of the group in helping guide decisions and the direction of the community. I've always welcomed differing opinions as it helps one see a fuller picture of issues or decisions that need to be made. Over the course of the year, I leaned on the Executive Committee for precisely this kind of input. I have grown as a person because of this, and I appreciate it. I'd also like to thank the Nuclear Energy Institute, particularly Hilary Lane, for their participation and support of the research and test reactor world. This has come in many forms including assistance with guidance documents, knowledge of industry trends/directions, and inclusion with important events and activities. Finally, I'd like to send a shoutout to Amber Johnson for being the nexus of communication for the entire community. Between her efforts on this newsletter and, most importantly, the revamping of the website, TRTR is in a much better place. I would like to extend my personal appreciation for her efforts. We are in a much better place because of it.

CONTENTS

Q3 EVENTS

TRTR Annual Meeting
Albuquerque, New Mexico
September 29 – October 3, 2024

Nuclear Materials Conference (NuMat) 2024
Singapore
October 14-17, 2024

RERTR International Meeting
Lyon, France
October 27-31, 2024

International Conference on Research Reactors
Vienna, Austria
November 11-15, 2024

ANS Winter Conference and Expo
Orlando, Florida
November 17-21, 2024

Nuclear 101 Certificate Course
Orlando, Florida
November 18-22, 2024

Conference on Nuclear Training and Education
Amelia Island, Florida
February 3-6, 2025

European Research Reactor Conference
Aix-en-Provence, France
April 6-10, 2025

International Symposium on Reactor Dosimetry
Charleston South Carolina
May 18-23, 2025

IGORR Meeting
Mito, Japan
June 15-19, 2025

ECONOMIC IMPACT

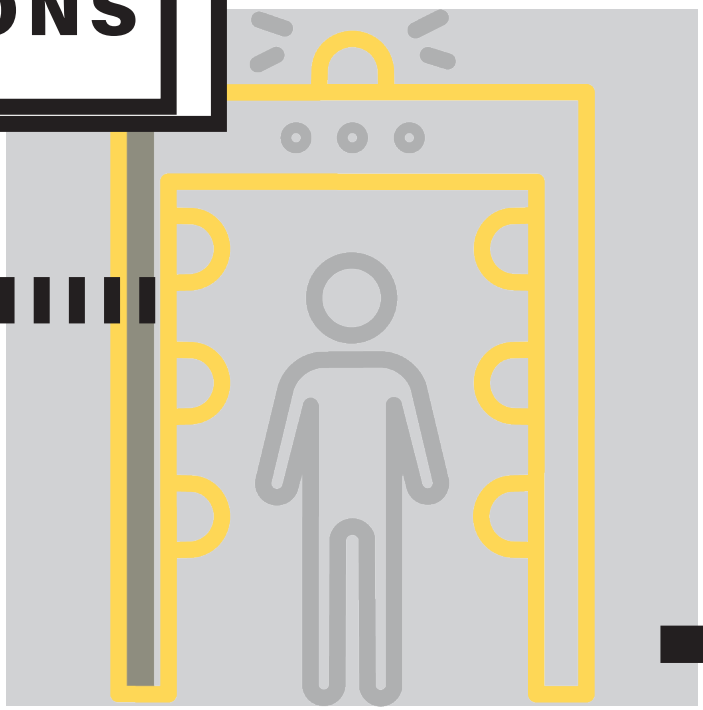
RTI International recently published a report on the Economic Impacts Of Investments In U.S. Neutron Research Sources And Facilities From 1960 To 2030 focused on quantifying the return on investment for the 3 main neutron scattering facilities in the US, the High-Flux Isotope Reactor, the NIST Center for Neutron Research, and the Spallation Neutron Source. The investigation found that the research performed at these facilities resulted in a net present value of $29.4 billion, and that for every dollar invested in U.S. neutron scattering research facilities, $2.67 in benefits are realized. Since 1960 at least 22,808 publications and 1,565 patents have been based on research conducted at neutron scattering facilities. A similar investigation conducted by the U.K.'s Technopolis Group in 2016 found a 214% return on investment for the ISIS Neutron and Muon Source, which is expected to have a net economic impact of £2.8 billion over its lifetime.

$ NEUTRONS $

The RTI investigation also identified that the current U.S. neutron scattering facilities do not have sufficient capacity to meet demand which results in lost or underutilized funding totaling approximately $1.1 million per year. The authors recommend forming a unified federal leadership committee to develop a roadmap for neutron scattering facilities and ensuring that sufficient funds are provided for maintaining and improving facilities, as well as developing new facilities.

RTI also published a paper on Perspectives On U.S. University Research Reactor Policy which suggests options for maximizing the use and functionality of university research reactors and concludes that "any comprehensive university research reactor strategy would best serve the neutron scattering community by involving representatives from university and federal research reactor facilities as well as industrial and academic users who rely on neutron-based research techniques [...] With appropriate federal intervention, US university research reactors, long underutilized and lacking modernization, can once again be important sources of scientific innovation, training, and fellowship."

INSPECTIONS



University of Wisconsin Nuclear Reactor Laboratory
April 29 – May 2, 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. ML24136A288

Missouri University Research Reactor
April 22-25, 2024 The inspection included a review of effluent and environmental monitoring, review and audit and design change functions, emergency preparedness, radiation protection, transportation activities, and safety-conscious work environment. **No violations** were identified. ML24130A189

Aerotest Radiography and Research Reactor
May 6-7, 2024 The inspection included a review of security compliance. **No violations** were identified. ML24137A273

Rhode Island Nuclear Science Center
May 20-22, 2024 The inspection included a review of security compliance. **No violations** were identified. ML24156A140

Pennsylvania State University Breazeale Reactor
March 13 & May 6-9, 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. ML24185A060

LICENSING

Kansas State University Nuclear Reactor

May 20-22, 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. The ongoing efforts to remove corrosion products from the fuel was discussed. **No violations** were identified. ML24157A109

Missouri University of Science and Technology Research Reactor

May 14-17, 2024 The inspection included a review of operations logs and records, requalification training, surveillance and limiting conditions for operation (LCO), design changes, emergency planning, maintenance logs and records, and fuel handling logs and records. Two past violations for failure of all operators to receive biennial medical exams and measure reactivity after core changes were closed out. **No violations** were identified. ML24169A852

University of Massachusetts-Lowell Research Reactor

June 24-26, 2024 The inspection included a review of security compliance. **No violations** were identified. ML24199A249

Idaho State University

The NRC states it expects its review of the License Amendment Request Idaho State University submitted in February 2023 (ML23074A066) to modify scram channel requirements to be completed by September 2024 (ML24176A019).

Kansas State University

Is requesting a temporary exemption (ML24085A808) from several requirements of 10 CFR 55.59 in order to maintain operator proficiency during the extended shutdown of the reactor to address fuel issues. KSU provided additional information for this request in June 2024 (ML24164A092). The NRC expects to complete its review by the end of December 2024(ML24229A171).

University of Utah

Revised its request for an exemption(ML24183A173) 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 (ML24183A165). In August, the NRC requested additional information to complete their acceptance review (ML24220A021).

NEWS

Attendees of the 2007 Summer Camp at Missouri S&T. Photo courtesy of Ethan Taber.

ADVANCE Act Signed

The ADVANCE Act directs the NRC to reduce licensing application fees and authorizes increased staffing for the NRC. It also creates DOE awards that can cover the total costs assessed by the NRC for first movers in a variety of areas, including the first advanced reactor to receive an operating or combined license.

Missouri S&T Hosts Summer Camp

Group of almost 50 students attended a week-long summer camp on Nuclear Engineering.

Inaugural Program Director Of Next-Gen MURR Named

The University of Missouri has selected Michael Hoehn II as the inaugural program director for NextGen MURR, the university's initiative to build a new 20 MW reactor for isotope production.

Two Penn State Reactor Operators Awarded DOE Fellowships

Penn State nuclear engineering graduate students, and Reactor Operators, Scout Bucks and Alex Nellis were awarded graduate fellowships from the U.S. Department of Energy. The fellowships include a $169,000 stipend issued over three years and a summer internship at a DOE lab.

USGS TRIGA Reactor Used In Determining Volcanic Eruption Ages

The USGS TRIGA Reactor is used to conduct argon dating, determining the age of volcanic rocks.

Abilene Christian Expects Construction Permit

The NRC expects to complete its review of Abilene Christian University's 1 MW

Molten Salt Reactor construction permit application by September 30th.

Kairos Power Completes Molten Salt Test

Kairos Power has completed testing on the largest FLiBe molten salt system ever built. The Engineering Test Unit (ETU-1) is now being decommissioned after more than 2000 hours of operation and will be replaced with ETU-2 which will focus on demonstrating the modular design of the reactor.

NRC Completes Hermes 2 Safety Review

The NRC has completed its final safety evaluation for Kairos Power's application to build its Hermes 2 molten salt–cooled reactor. A construction permit can be issued once the NRC completes its environmental review.

Hermes Begins Construction

Construction of Hermes, Kairos Power's 35-MWth Test Reactor has begun in Oak Ridge Tennessee. The reactor is expected to become operational in 2027.

DOE Approved Safety Design Strategy for Radiant

The US DOE reviewed and approved the Safety Design Strategy for the Radiant Kaleidos microreactor, a key step before the reactor can be tested at Idaho National Laboratory's Microreactor Experimental Demonstration Facility.

Work Starts On MYRRHA

Construction has started on the Multipurpose Hybrid Research Reactor for High-tech Applications (MYRRHA), which will be an accelerator driven subcritical reactor intended to replace Belgium's BR2 Research Reactor.

Administrative Court Confirms Lawful Operation Of FRM-II

The Bavarian Administrative Court dismissed a complaint by the Bund Naturschutz against the FRM II research reactor for having not yet converted to LEU fuel. FRM-II expects to apply for a license amendment to use LEU fuel in 2025.

Kazakh Research Reactor - A Photo Report

The VVR-K Research Reactor in Almaty is the only reactor in Kazakhstan and is used for isotope production, gem irradiation, neutron activation analysis, and training.

Video on Jamaica's Nuclear Reactor

The SLOWPOKE reactor at the University of West Indies was recently featured in a video.

KAERI Completes Upgrade Of Bangladeshi Research Reactor

KAERI has completed a $3.9 million contract to modernize the instrumentation and control system of the 3 MW TRIGA MkII Bangladesh Training Research Reactor.

McMaster University's Reactor License Renewed

The Canadian Nuclear Safety Commis-

News Continued

sion renewed McMaster University's license for 20 years. The McMaster Nuclear Reactor has been in operation since 1959.

New Instrumentation And Control System For OPAL Reactor

During the scheduled shutdown of the OPAL multi-purpose reactor, an ANSTO engineering and project team has installed a new safety shutdown instrumentation and control system.

Research Reactor to be Used to Study Fukushima Debris

Japan's STACY critical assembly reactor will be used to study the possibility of an accidental criticality as the fuel debris is removed from the Fukushima reactors.

IAEA Conducts Research Reactor Infrastructure Review In Thailand

An IAEA team conducted a Integrated Nuclear Infrastructure Review for Research Reactors (INIR-RR) mission in Thailand to review the country's preparedness to move forward with plans for two new research reactors. The review found that Thailand has made progress in several key areas, including the regulatory framework, human resource development and procurement standards.

Fabrication For MARVEL Underway

MARVEL is targeted to begin operations in 2027.

REPORTABLE OCCURENCES

Texas A&M TRIGA Reactor

2 fuel elements were found to be outside of the Technical Specification limit for transverse bend during fuel inspection. (EN-57174, 6/14/2024)

Missouri University Research Reactor

Exhaust filters were found to not be meeting Technical Specification requirements between July 2022 and April 2024. MURR submitted a follow up report on 7/2/2024 (ML24184A113); new filters meeting the requirements have been installed, and procedures are being updated. (EN-57180, 6/18/2024)

USGS TRIGA Reactor

Numerous fuel elements found to have failed visual inspections. The cause of the failure has not yet been reported. (EN-57191, 6/25/2024)

NC State University PULSTAR Reactor

Required power monitoring channel failed during operation. NC State submitted a follow up report on 7/2/2024 (ML24193A107); the issue was unable to be reproduced after the day of the event. NC State may apply for a license amendment that would update the definition

of Reportable Occurrence to allow for prompt operator action in the event of a channel failure to not result in a Reportable Occurrence. (EN-57196, 6/27/2024)

Maryland University Training Reactor
An operator momentarily switched on a ventilation fan while the reactor was not secured, violating the Technical Specifications for Confinement.(EN-57207, 7/3/2024)

Missouri University of Science and Technology Reactor
Failed to meet minimum staffing requirements when the reactor key was left in the console unattended. A follow up report was submitted on 8/8/24 (ML24221A288); an additional visual indication will be added to help alert the operator that the key is in the console, and additional training will be conducted for all staff. (EN-27239, 7/24/2024)

NPUF AFFIRMATION

The NRC Commissioners voted to affirm the NPUF Rule which will eliminate license terms for research reactors, modify the definition of Testing Facilities to be based on an accident dose criterion, and make several other administrative changes. The proposed interpretation of the Backfitting Rule's applicability to Non-Power Reactors was not approved by the Commission. The comments from Commissioners Caputo, Crowell, Wright, and Chair Hanson are now available. The NRC staff will make minor changes to the Final Rule as directed by the Commission before it is published in the Federal Register and takes effect 30 days later.

IAEA GUIDANCE

Neutron Activation Analysis Using Short Half-Life Radionuclides

Guidelines For Ageing Management, Modernization And Refurbishment Programmes For Research Reactors

GONE FISSION

See you in Albuquerque!