



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

January 8, 2021

Mr. Walter Dale Tomlinson
Reactor Facility Director
Armed Forces Radiobiology
Research Institute
4555 South Palmer Road, Building 42
Bethesda, MD 20889-5648

SUBJECT: ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE – SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF THE APPLICATION FOR A LICENSE AMENDMENT RE: UPGRADE OF DIGITAL INSTRUMENTATION AND CONTROL SYSTEM (EPID L-2020-NFA-0012)

Dear Mr. Tomlinson:

By letter dated November 10, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20318A339), and enclosures (ADAMS Accession Nos. ML20318A340, ML20318A343, ML20318A346, ML20318A347, ML20318A348, ML20318A349), Armed Forces Radiobiology Research Institute applied for an amendment to Facility Operating License No. R-84 for the Armed Forces Radiobiology Research Institute TRIGA-Mark F tank-type nuclear reactor facility. The license amendment request proposes an upgrade to the digital instrumentation and control system and related technical specification (TS) changes.

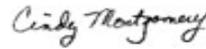
Consistent with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.90, "Application for amendment of license, construction permit, or early site permit," an application to amend a license (including the TSs) must be filed with the Commission, as specified in 10 CFR Section 50.4, "Written communications." The application must fully describe the changes desired, and follow, as far as applicable, the form prescribed for the original application. Section 50.34, "Contents of applications; technical information," of 10 CFR addresses the content of technical information required and stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The U.S. Nuclear Regulatory Commission (NRC) staff performed an acceptance review of the license amendment request (LAR) and determined that the information described in the enclosure to this letter is needed to find the application acceptable and begin the detailed technical review. Accordingly, the NRC staff requests a supplement to the application to address the information described in the enclosure to this letter by 30 days from the date of this letter.

If the supplement is not received by the agreed date, the application will not be accepted for review pursuant to 10 CFR Section 2.101, "Filing of application," and the NRC may cease its associated review activities. Any request for additional time to provide the supplement should include the reason for requesting additional time and a proposed date to provide the supplement to allow the NRC staff to make an informed decision on whether to grant the request.

The NRC staff discussed the enclosure and the time frame for providing a supplement with you on December 10, 2020. If you have any questions, please contact me at (301) 415-3398, or by electronic mail at Cindy.Montgomery@nrc.gov.

Sincerely,



Signed by Montgomery, Cynthia
on 01/08/2021

Cindy Montgomery, Project Manager
Non-Power Production and Utilization Facility
Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-170
License No. R-84

Enclosure:
As stated

cc: See next page

Armed Forces Radiobiology Research Institute

Docket No. 50-170

cc:

Director, Maryland Office of Planning
301 West Preston Street
Baltimore, MD 21201

Montgomery County Executive
101 Monroe Street, 2nd Floor
Rockville, MD 20850

Environmental Program Manager III
Radiological Health Program
Air & Radiation Management Adm.
Maryland Dept of the Environment
1800 Washington Blvd., Suite 750
Baltimore, MD 21230-1724

Director
Air & Radiation Management Adm.
Maryland Dept of the Environment
1800 Washington Blvd., Suite 710
Baltimore, MD 21230

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

Manager
Nuclear Programs
Maryland Department of Natural Resources
Tawes B-3
Annapolis, MD 21401

Colonel Mohammad Naeem, Director
Armed Forces Radiobiology Research Institute
4301 Jones Bridge Road
Bethesda, MD 20814

SUBJECT: ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE – SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF THE APPLICATION FOR A LICENSE AMENDMENT RE: UPGRADE OF DIGITAL INSTRUMENTATION AND CONTROL SYSTEM (EPID L-2020-NFA-0012) DATED: January 8, 2021

DISTRIBUTION:

PUBLIC
 NParker, NRR
 CMontgomery, NRR
 MTakacs, NRR
 MWaters, NRR
 GCasto, NRR
 PBoyle, NRR
 RAlvarado, NRR
 JAshcraft, NRR
 BSmith, NRR

ADAMS Accession No. ML20356A297

NRR-106

OFFICE	NRR/DANU/PM	NRR/DANU/LA	NRR/DEX/BC	NRR/DANU/BC	NRR/DANU/PM
NAME	CMontgomery	NParker	MWaters	GCasto	CMontgomery
DATE	12/22/2020	12/22/2020	12/29/2020	12/29/2020	01/08/2021

OFFICIAL RECORD COPY

OFFICE OF NUCLEAR REACTOR REGULATION
SUPPLEMENTAL INFORMATION NEEDED FOR
ACCEPTANCE OF A LICENSE AMENDMENT REQUEST
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE TRIGA-MARK F TANK-TYPE
NUCLEAR REACTOR FACILITY
LICENSE NO. R-84; DOCKET NO. 50-170

By letter dated November 10, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20318A339), and enclosures (ADAMS Accession Nos. ML20318A340, ML20318A343, ML20318A346, ML20318A347, ML20318A348, ML20318A349), the Armed Forces Radiobiology Research Institute (AFRRI) submitted a license amendment request (LAR) for the AFRRI Training, Research, Isotopes, General Atomics [TRIGA] Reactor. The LAR is to replace and upgrade the digital instrumentation and control (I&C) systems for the reactor. In addition, AFRRI submitted modifications to its technical specifications (TSs) related to the upgrade of the digital I&C systems.

The U.S. Nuclear Regulatory Commission (NRC) staff performed an acceptance review of the LAR and determined that information is needed to find the application acceptable and begin the detailed technical review. The LAR described some of the proposed digital I&C systems that would replace the existing digital I&C systems and related modifications to AFRRI TSs. However, the LAR is unclear and contradictory regarding the scope of review requested for NRC approval and does not thoroughly identify the specific digital I&C systems proposed to be replaced and/or upgraded; nor does the LAR provide the necessary safety analysis of all proposed changes to the digital I&C systems.

The LAR should clearly identify, specify, and describe all systems being requested for approval, including all of those that are new, those that feature different/combined functions, as well as those that are being replaced like-for-like, have identical form and function, and/or contain equivalent equipment. Supporting information should be provided to demonstrate that the design satisfies applicable acceptance criteria in NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria" (ADAMS Accession No. ML042430048), as well as why the change is safe. In a table similar to Table 1-1 in the LAR, a complete list of changes should be provided to summarize all changes to the AFRRI control systems. The updated table should list the equipment to be replaced or upgraded and the function performed by the old and new equipment, as well as provide a brief discussion of the difference between the old and new equipment.

As an example, in Enclosure 1c of the submittal letter, AFRRI stated that "[w]ith the exception of the neutron flux detectors the entire control system has been replaced;" however, the descriptions provided in the LAR for certain digital I&C systems are not clearly defined. The following examples represent additional comments made by the NRC staff that AFRRI can use to aid in their understanding of the complete information expected by the NRC staff in AFRRI's submission, and please note that the NRC staff emphasizes that this is not a complete list of items to be addressed:

- The LAR identifies equipment that appears not to have been replaced, even though AFFRI stated that all systems were replaced. For example, the transient rod drive is described in detail but the transient rod drive is not being replaced.
- The LAR identifies equipment that has been replaced with another piece of equipment that apparently provides the same functionality, but the LAR does not clearly describe the new equipment's functionalities and components. Nor does the LAR provide an analysis of why that new piece of equipment is safe. For example, the NM-1000 is being replaced with NLW-1000 and NMP-1000. This replacement requires adding a new compensated ion chamber (CIC) near the reactor core. The LAR states that the new CIC will be coupled with the new NMP-1000. The LAR only mentions the new CIC in Table 1-1 and does not provide additional description or safety analysis; and the LAR provides no description of the impact of the geometry associated with the new location of the fission chamber and companion CIC.
- The LAR identifies equipment that has been upgraded to a newer version; however, the LAR does not sufficiently describe the equipment; nor does the LAR provide a safety analysis for the new equipment. For example, the LAR states that the NP-1000 was upgraded to a new version of the channel and that the NP-1000 now features an added digital display and local controls using touchscreen buttons. However, the LAR does not discuss exactly what the upgrade includes, nor does it discuss information about the added display and local controls, nor how the analog safety channel is maintained since digital display and local controls via touchscreen were added.