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

August 9, 2018

Mr. David Vasbinder, Director
Buffalo Materials Research Center
State University of New York
University at Buffalo
220 Winspear Avenue
Buffalo, NY 14215

SUBJECT: TERMINATION OF FACILITY OPERATING LICENSE NO. R-77 FOR THE BUFFALO MATERIALS RESEARCH CENTER REACTOR AT THE STATE UNIVERSITY OF NEW YORK AT BUFFALO

Dear Mr. Vasbinder:

By letter dated February 17, 2012 (Agencywide Documents Access and Management System (ADAMS) Package No. ML120540187), as supplemented by letters dated June 20, 2012 (ADAMS Accession No. ML121870132), September 21, 2012 (ADAMS Accession No. ML122780454), and October 15, 2012 (ADAMS Accession No. ML12297A237), the State University of New York at Buffalo (UB) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) to approve a license amendment and a revised decommissioning plan (DP) for the Buffalo Materials Research Center (BMRC) reactor. The NRC approved the UB revised DP by Amendment No. 27, dated November 5, 2012 (ADAMS Accession No. ML12290A694).

In the Safety Evaluation Report related to the DP approval (ADAMS Accession No. ML12286A352), the NRC staff determined that the revised Final Status Survey (FSS) Plan for the BMRC (ADAMS Accession No. ML12278A373) was consistent with the guidance and methodology in NUREG-1575, “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)” and NUREG-1757, “Consolidated Decommissioning Guidance.” The licensee’s decommissioning activities included decontamination, dismantlement, and demolition of various systems, structures, and components followed by MARSSIM-based FSS.

By letter dated January 12, 2017, UB submitted the FSS Report for the BMRC and requested the termination of Facility Operating License No. R-77 (ADAMS Accession No. ML17039A897). The NRC staff reviewed the FSS Report, which states that the criteria for termination set forth in UB’s license, and as established in its DP and FSS Plan, have been satisfied. Upon the staff’s review, several additional questions and items requiring clarification were provided to the licensee, and supplemental information was provided by e-mail dated February 13, 2018 (ADAMS Accession No. ML18075A415).

With respect to FSS scanning measurements, the FSS Report (i.e., Sections 3.1.5 and 3.1.6) focused mainly on scan investigation levels, which could be as high as 5 times the Derived Concentration Guideline Level (DCGL) release limits for Class 1 survey units. It was, therefore, necessary for the NRC staff to understand that FSS walkover scans were adequate and that, if required, any adjustments to the number of soil samples were made in correlation with detection capabilities. To that end, there were some NRC staff concerns that, if surveyors only

responded to the scan investigation levels in Class 1 survey units, then additional discrete soil samples might be required to bound potential elevated areas of contamination (as discussed in Section 5.5.2.4 of MARSSIM). The licensee indicated in their February 13, 2018, supplemental email that survey technicians were instructed to pause and investigate all audibly detected elevated count rates during the FSS, and the licensee indicated that scanning detection capabilities were able to detect residual radioactivity below the DCGL level. Under these circumstances, the NRC staff concludes the licensee's overall survey approach is adequate.

With respect to elevated areas of residual radioactivity, Section 3.1.6.1 of the FSS Report describes a situation where scan surveys in Survey Unit 5 (SU5) indicated that levels of residual radioactivity were likely present above the DCGL for average concentrations over a wide area ($DCGL_W$) for cobalt-60 (upon which the FSS investigation levels were based). The NRC staff notes that SU5 was a Class 2 unit per MARSSIM guidance, and areas of contamination above the $DCGL_W$ would not be expected. Positive identification of contamination above the $DCGL_W$ would warrant reclassification to Class 1 per MARSSIM guidance. As such, additional information was requested from the licensee with respect to scan coverage and the assessment/disposition of areas of elevated residual radioactivity. The licensee responded in the February 13, 2018, supplemental email, and indicated that 100 percent scan coverage was completed around the area of the elevated readings. The NRC staff concludes that survey coverage utilized in this area is adequate and consistent with a Class 1 survey unit design. The licensee also indicated that the elevated area was less than 0.1 square feet in size and was left in place. As a result, the NRC staff concludes that a small area of elevated radioactivity was left and buried at the site but that it is not considered dose significant and does not change the NRC staff's conclusion that the survey unit is below the levels acceptable for unrestricted release.

Throughout the decommissioning process, inspectors from the NRC's Region I office conducted routine safety inspections at the BMRC, as documented in the following NRC Inspection Reports (IRs): IR 050-00057/2015-001 (ADAMS Accession No. ML16007A027), IR 050-00057/2014-001 (ADAMS Accession No. ML15027A411), IR 050-00057/2013-003 (ADAMS Accession No. ML14219A022), IR 050-00057/2013-002 (ADAMS Accession No. ML13204A096), and IR 050-00057/2013-001 (ADAMS Accession No. ML13106A379). The inspectors followed the NRC's program for overseeing the safe decommissioning of a Research and Test Reactor as described in the NRC's Inspection Manual Chapter (IMC) 2545, "Research and Test Reactor Inspection Program." The inspections consisted of observations by the inspectors, interviews with BMRC and contractor personnel, confirmatory measurements, collection of soil samples, and a review of work plans and work instructions. The NRC inspections also verified that radioactive waste associated with the decommissioning project had been shipped offsite and that the decommissioning and final status survey activities were being conducted safely and in accordance with regulatory requirements, licensee commitments, and the NRC-approved DP. No health or safety concerns were identified during the NRC inspections.

During the periods of January 26-29, February 3-6, and August 17-21, 2015, the Oak Ridge Associated Universities (ORAU) performed confirmatory surveys in support of the BMRC excavation, which included surveys of surrounding soils, backfill material, and soil laydown areas. The survey activities included visual inspections, gamma radiation surface scans, gamma and beta radiation measurements, and soil sampling of six FSS units, which were combined into two confirmatory survey units. At the time of confirmatory survey activities, structures associated with the BMRC had been demolished and removed from the site. The

site consisted of exposed bedrock where the BMRC facility was located and the impacted soils surrounding the excavation. The ORAU provided the results of the confirmatory surveys in a report dated January 6, 2016 (ADAMS Accession No. ML16006A200). The ORAU site data support the conclusion that the residual activity levels satisfy the DCGLs.

Based on the NRC staff's evaluation of the FSS Report sampling and scanning data, NRC staff inspections, ORAU confirmatory analysis, and comparison to the BMRC reactor DP and FSS Plan criteria, the NRC staff concludes that the BMRC reactor decommissioning has been performed and completed in accordance with the approved DP and that the facility and site are suitable for unrestricted release in accordance with the radiological criteria for license termination in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 20, subpart E. Thus, the NRC staff concludes that UB has demonstrated that the site meets the radiological conditions for license termination pursuant to 10 CFR 50.82(b)(6). Accordingly, Facility Operating License No. R-77 is hereby terminated.

In connection with the license termination, enclosed are two copies of Amendment No. 14 to Indemnity Agreement No. E-34. Please sign and return one copy to this office.

Also enclosed is a copy of the Notice of License Termination, which is being sent to the Office of the *Federal Register* for publication. In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions concerning this matter, please contact Kim Conway at (301) 415-1335 or kimberly.conway@nrc.gov.

Sincerely,

/RA/

Andrea L. Kock, Acting Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 50-57

Enclosures:
1. Two copies of Amendment No. 14 to Indemnity Agreement No. E-34
2. *Federal Register* Notice

cc: Docket Service List

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