University at Buffalo
The State University of New York

Environment, Health & Safety Services

March 30, 2012

Docket 50-57
License R-77

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Dear Sir or Madam:

Enclosed please find a copy of the 2011 Annual Facility Technical Report for the Buffalo Materials Research Center (BMRC) at the State University of New York at Buffalo. This report is submitted pursuant to Facility Technical Specification Requirement 15.1.

If you have any questions or wish further information, please contact me at (716) 829-3301.

Sincerely,

David R. Vasbinder
Director, Buffalo Materials Research Center

Cc: Ted Smith, U.S.N.R.C. Project Manager
Judith Joustra, U.S.N.R.C. Region 1
Kevin Thompson, Reactor Decommissioning Safety Committee Chair
Joseph Raab, EH&S Director
Mike Dupre, Assistant Vice President for University Facilities
Jeff Slawson, BMRC Radiation Safety Officer
Mark Adams, BMRC Operations Manager

TSME20
FSME

220 Winspear Avenue, Buffalo, NY 14215
Office: (716) 829-3301 Fax: (716) 829-2516 Web: www.ehs.buffalo.edu

STATE UNIVERSITY OF NEW YORK AT BUFFALO

BUFFALO MATERIALS RESEARCH CENTER

ANNUAL TECHNICAL REPORT

License R-77

Docket 50-57

Calendar Year 2011

Submitted by:

David R. Vasbinder
Director

March 30, 2012

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1. INTRODUCTION

This report is submitted to the United States Nuclear Regulatory Commission (NRC) pursuant to section 15.1 of Appendix A, of the Technical Specifications (License R-77) for the Buffalo Materials Research Center (BMRC) located at the State University of New York at Buffalo. It summarizes changes to the facility, major maintenance activities, surveillance tests and inspections, radiation surveys, and radioactive effluents for the 2011 calendar year. All required surveillance was completed.

In 2011, the University continued working with the Decommissioning Project Design Consultant, ENERCON on pre-decommissioning activities. Pre-decommissioning related activities undertaken in 2011 included:

- Completion of the Facility Site Characterization.
- Packaging and shipment of facility legacy waste material.
- Completion of Reactor Activation Analysis and Segmentation Plan report in support of development of Decommissioning Plan.

2. MAJOR MAINTENANCE

There were no maintenance activities performed in the BMRC during 2011 that would qualify as Major Maintenance. Only routine maintenance activities were undertaken within the BMRC.

3. 10CFR 50.59 CHANGES

There were no 50.59 reviews performed during the 2011 calendar year.

4. RADIOACTIVE EFFLUENTS

4.1 Controlled Discharges to the Sanitary Sewer

There were three controlled discharges to the sanitary sewer system in 2012. The total volume of water released was 85,800 liters, containing a total of approximately 0.0164 millicuries of radioactivity. All three releases were from the 10,000 gallon above ground waste storage tank (referred to as 10K Tank). Tables 1, 2, and 3 contain the discharge information specific to the releases including comparisons to the monthly average concentration in 10 CFR Part 20, Appendix B, Table 3 "Releases to Sewers" and the sum of the fractions.

4.2 Airborne Releases

No airborne radioactive releases, other than natural background resulting from radon and its daughter products, occurred during 2011.

5. ENVIRONMENTAL RADIOLOGICAL SURVEYS

5.1 Routine Surveys

The direct radiation levels outside the BMRC reactor building are routinely monitored adjacent to the "truck door" access area and on the roof of the liquid waste holding tank vault.

Global Dosimetry Solutions dosimeters were used to monitor integrated radiation levels in six exterior areas around the facility and four locations within the building itself. These dosimeters are replaced with a new badge every month and the previous month's badge is sent to the dosimetry vendor for processing. The vendor is NVLAP certified. The minimum photon sensitivity for the dosimeters is 5 mrem.

Table 4 lists the cumulative annual summary of the environmental radiation dose equivalent from the environmental badges located around the facility. The maximum cumulative annual deep dose equivalent reading was 85 mRem on the dosimeter (# 2118) located by the truck door exit from the containment building. This dose was delivered entirely from two months (August and September) during which waste containers were staged awaiting shipment.

Table 5 lists cumulative annual summary of the radiation dose equivalent from the area dosimetry badges located within the building. The maximum cumulative annual deep dose equivalent reading was 34 mRem on the dosimeter (# 1624) located on the bridge located directly above the reactor pool.

6. RADIATION EXPOSURES

6.1 External Dosimetry

External dosimetry records were maintained for a total of five BMRC staff members, sixteen employees of the Decommissioning Project Design Consultant, and other authorized facility entrants. Film dosimeters provide x-ray, beta, and gamma exposure monitoring. Thermoluminescent dosimeter (TLD) rings are used to measure extremity dose for selected personnel. Also, a TLD for neutron detection is available when necessary. All dosimeters are processed by Global Dosimetry Solutions, a NVLAP certified vendor. These dosimeters are replaced on a bi-monthly basis. The film dosimeters have a minimum sensitivity of 10 mrem for both beta and photon radiation.

During 2011, six individuals received measureable whole body dose. The highest whole body dose received was 31 mRem which was received by two individuals working for the Decommissioning Project consultant performing legacy waste packaging activities.

Ten individuals received measureable extremity doses in 2011. The highest extremity dose received was 336 mRem which was received by an employee of the Project consultant performing legacy waste packaging activities.

University Police Department officers perform routine security tours around the building. The patrol officers wear a University Police dosimeter pack when they enter the building. These dosimeters did not record any dose equivalent during 2011.

Four visitor dosimeter packs are also available. These dosimeters are issued to visitors who may need to enter into areas requiring exposure monitoring. None of these visitor dosimeters recorded any measurable dose equivalent in 2011.

Tables 6 and 7 provide summaries of personnel whole body and extremity dose for 2011.

7. RADIATION AND CONTAMINATION SURVEYS

7.1 Exit Monitoring

Exit monitoring is required as part of each egress from the reactor containment building and other radioactive materials areas within the BMRC. These surveys occasionally detect radioactive contamination, allowing rapid correction of contamination problems.

7.2 Routine Surveys

The BMRC staff performs monthly radiation and contamination surveys of the BMRC building. Surveys are also performed after work involving the manipulation of potentially contaminated materials. In calendar year 2011, contamination was occasionally detected during these surveys. In all such instances the contaminated areas were cleaned and re-surveyed until acceptable levels were achieved.

8. MISCELLANEOUS

- The Reactor Decommissioning Safety Committee convened four times during calendar year 2011. This meets the annual requirement in Facility Technical Specifications for a minimum of two committee meetings.

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Table 1 -- Waste Tank Release to Sanitary Sewer

Release Number: 2011-01
From: 10K Tank
Month: March

Volume Released: 6800 gal.
2.58 E+07 ml
Date of Release: 3/18/11

Nuclide	Tank (μCi/ml)	Monthly Limit (μCi/ml)	Release (μCi/ml)	Percent of Monthly Limit
Ag-108m	2.0 E -07	9 E-05	4.5 E-09	5.0 E-03
Unidentified Beta	2.41 E-07	2E-08	5.4 E-09	2.7 E+01

TOTAL CONCENTRATION 4.41 E-07 μCi/ml

Total of Limit Released: 29.96 %

Total of Activity Released: 11.40 μCi

Year to Date Activity Released: 11.40 μCi

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Table 2 -- Waste Tank Release to Sanitary Sewer

Release Number: 2011-02
From: 10K Tank
Month: June

Volume Released: 7950 gal.
3.02 E+07 ml
Date of Release: 6/2/11

Nuclide	Tank (μCi/ml)	Monthly Limit (μCi/ml)	Release (μCi/ml)	Percent of Monthly Limit
Unidentified Beta	7.61 E-08	2E-08	2.0 E-09	9.9 E+00

TOTAL CONCENTRATION 7.61 E-08 μCi/ml

Total of Limit Released: 9.94 %

Total of Activity Released: 2.30 μCi

Year to Date Activity Released 13.70 μCi

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Table 3 -- Waste Tank Release to Sanitary Sewer

Release Number: 2011-03
From: 10K Tank
Month: December

Volume Released: 7850 gal.
2.98E+07 ml

Date of Release: 12/22/11

Nuclide	Tank (μCi/ml)	Monthly Limit (μCi/ml)	Release (μCi/ml)	Percent of Monthly Limit
Unidentified Beta	9.05 E-08	2E-08	1.6 E-09	7.8 E+00

TOTAL CONCENTRATION 9.05 E-08 μCi/ml

Total of Limit Released: 7.79 %

Total of Activity Released: 2.70 μCi

Year to Date Activity Released 16.40 μCi

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Table 4 -- 2011 Cumulative Summary of Environmental Radiation Dose Equivalent (mrem)

Monthly Monitoring Period	B 2118 Truck Door Outside	C 2120 Fence 1	D 2121 Fence 2	E 2122 Fence 3	G 2116 Waste Vault	H Containment Wall	Control Average
January	0	0	0	0	3	0	18
February	0	0	0	0	1	0	10
March	0	0	0	0	1	0	15
April	0	0	0	0	0	0	14
May	0	0	0	0	0	0	14
June	0	0	0	0	5	0	15
July	0	0	0	0	0	0	14
August[1]	45	27	1	0	2	0	12
September[1]	40	5	1	1	3	1	14
October	0	0	0	0	1	0	14
November	0	0	0	0	2	0	15
December	0	0	0	0	1	0	17
Total	85	32	2	1	19	1	

Exposure reported (mR/month) is subtracted from control average.

Note 1 = Legacy waste clean out conducted during July to September. Waste containers temporarily staged for shipment resulted in increased dose at some monitoring locations.

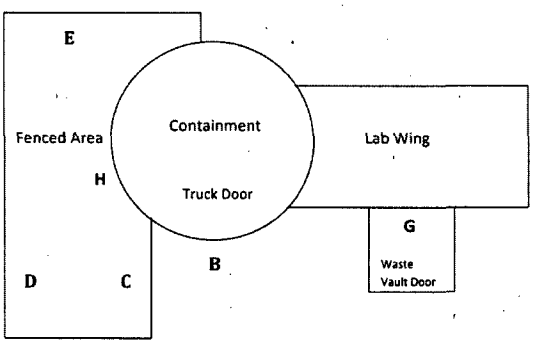

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Table 5 -- 2011 Cumulative Summary of BMRC Area Dosimeter Results

Monthly Monitoring Period	335 Truck Door	1624 Bridge	357 Building Air Area	356 Stack Gas Area	Control Average
January	0	3	0	0	18
February	0	5	0	0	10
March	0	3	0	0	15
April	0	2	0	0	14
May	0	3	0	1	14
June	0	2	0	0	15
July	4	0	0	1	14
August[1]	86	31	25	0[2]	12
September[1]	70	4	0	N/A	14
October	11	4	0	N/A	14
November	13	4	0	N/A	15
December	19	5	0	N/A	17
Total	201	66	25	2	

Exposure reported (mR/month) is subtracted from control average.

Note 1 = Legacy waste clean out conducted during July to September. Waste containers temporarily staged for shipment resulted in increased dose at some monitoring locations.

Note 2 = "S Gas Area" – Stack Gas monitor dosimeter was inadvertently packed with equipment being removed from the facility and is irretrievable. Stack system out of service. Location no longer monitored.

Table 6 -- 2011 Whole Body Deep Dose Equivalent Summary

Deep Dose Equivalent (rem)	BMRC Staff	University Police	Visitor	Fuel Handler Dosimeter	Consultant Staff
None Measurable	5	1	4	1	10
0.001 to 0.100	0	0	0	0	6
> 0.100	0	0	0	0	0

Table 7 -- 2011 Extremity Shallow Dose Equivalent Summary

Extremity Shallow Dose (rem)	BMRC Staff	Consultant Staff
None Measurable	4	7
0.010 to 0.100	1	4
> 0.100	0	5