ANNUAL TECHNICAL REPORT

STATE UNIVERSITY OF NEW YORK AT BUFFALO

BUFFALO MATERIALS RESEARCH CENTER

License R-77

Docket 50-57

Calendar Year 1997

Submitted by:

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Director

TABLE OF CONTENTS

Page

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 1997 calendar year.

In July of 1996, Buffalo Materials Research Center applied to the Nuclear Regulatory Commission for a license amendment to withdraw authorization to operate the reactor and enter into a Possession Only License condition. Included with this application was the proposed Possession Only Technical Specifications. The Commission supplied BMRC with a request for additional information in December of 1996 and requested changes in the amendment request in April of 1997.

Buffalo Materials Research Center was issued amendment number 24 to Facility Operating License R-77 on June 19, 1997 thereby entering Possession Only status. On July 17th fuel assemblies were moved on the grid plate to alternate rows and unused grid plate locations were plugged to prevent storage of more than 15 assemblies on the plate in accordance with the Possession Only Technical Specifications.

2. MAJOR MAINTENANCE

There were no major maintenance activities undertaken during calendar year 1997.

3. CHANGES TO FACILITY

A new state of the art security alarm system was installed in the facility in 1997. Its features and capabilities are described in the Buffalo Materials Research Center Security Plan and are considered 10CFR2.970 information (not for public disclosure).

4. 50.59 CHANGES

There were no experiments or changes to the facility pursuant to 10 CFR 50.59 during 1997.

5. RADIOACTIVE EFFLUENTS

5.1 Controlled Discharges to the Sanitary Sewer

There were two controlled discharges to the sanitary sewer during 1997. The total volume of water released was 64,410 liters, containing a total of 0.446 millicuries of radioactivity. Both releases were from the 10,000 gallon above ground waste storage tank referred to as 10K Tank. Tables 1 and 2 contain the discharge information specific to each release including comparison to the monthly average concentration in 10 CFR Part 20, Appendix B, Table 3 "Releases to Sewers" and the sum of the fractions. Table 3 summarizes the total discharges for the year.

5.2 Airborne Releases

There were no airborne radioactive releases during 1997 other than natural background resulting from radon and its daughter products.

6. ENVIRONMENTAL RADIOLOGICAL SURVEYS

6.1 Routine Surveys

The direct radiation levels outside the BMRC reactor building are frequently monitored adjacent to the "truck door" access area and on the roof of the above ground 10,000 gallon liquid waste holding tank vault. Environmental TLD's and/or film badges are used to monitor integrated radiation levels in these areas as well as by the front door entrance to the facility and on a fence by the cooling tower. The minimum sensitivity for the TLD's is 10 mRem for the 3 months the monitor is posted in the field and the minimum sensitivity for the film badges is 10 mRem/month. The results from these dosimeters for 1997 were below the minimum sensitivities except for a total annual exposure of 50 mRem on the Truck Door TLD and 10 mRem for the year on the Front Door TLD.

Semi-annual "tell-tale" samples were drawn and analyzed from the sampling well tubes adjacent to the underground liquid waste tanks. These analyses detected no radioactivity in excess of background levels.

7. RADIATION EXPOSURES

7.1 External Dosimetry

Dosimetry records were maintained for a total of 10 staff members and authorized facility entrants. Dosimeters provide X, beta, and gamma exposure monitoring, and for selected personnel neutron detecting films are also employed. TLD rings are used to measure extremity dose. All dosimeters are processed by a NVLAP certified vendor.

The maximum annual whole body dose to an individual was 0.010 Rem which was received by the individual who performs survey meter and area and effluent monitor calibrations. The maximum extremity dose to an individual was 0.300 Rem which was received by an individual who performed hot chemistry processing of Hg-203 radioisotope.

University Public Safety Officers perform walkthrough security tours of the building at least once every eight-hour shift during off-hours and holidays. The patrol officers wear one of two Public Safety dosimeter packs located in the building reception area when they perform these walkthroughs. Neither of these dosimeters received any measurable dose in calendar year 1997.

Four visitor packs are available that contain film badges. These packs are issued to visitors who need to enter into areas that require monitoring. None of the four visitor packs received any measurable dose calendar year 1997.

Tables 4 and 5 provide summaries of personnel whole body and extremity dose for calendar year 1997.

8. RADIATION AND CONTAMINATION SURVEYS

8.1 Exit Monitoring

Exit Monitoring is required during 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.

8.2 Routine Surveys

Monthly surveys of the BMRC building were performed by the Health Physics staff. BMRC contamination action levels are 30 DPM/100cm^2 beta for personal items, 200 DPM/100cm^2 beta otherwise. On four occasions contamination in excess of action levels was detected on items or surfaces not labeled or restricted as contaminated. Contamination levels ranged from 200 DPM/100 cm^2 to 120,000 DPM/100 cm^2. The 120,000 DPM was detected on the floor following the removal of a long standing concrete block and lead storage area that had held samples irradiated in the reactor for neutron activation analysis. The contamination was detected in a floor location that was previously covered by this storage barn. Table 6 provides a summary of levels of contamination detected during building surveys in 1997.

9. FACILITY ORGANIZATION

Under Possession Only License status, the facility organization remained the same. All positions described in the Technical Specifications remained filled by the same individuals as under operational status. The Facility management maintained the same reporting structure within the University at Buffalo.

10. MISCELLANEOUS

- The Annual Emergency Evacuation Exercise was conducted on November 12th.

State University of New York at Buffalo
Buffalo Materials Research Center

Table 1 97-01 10K Tank

BMRC **Waste Tank Release to Sanitary Sewer Report**

Release Number: 97-01
From: 10K Tank
Month: March

Amount Released: 8050 gal.
3.06E+07 ml

Date of Release: 3/13/97

Nuclide	Tank (uCi/ml)	Monthly Limit (uCi/ml)	Release (uCi/ml)	Percent of Monthly Limit
Ag-108m	1.05E-07	9E-05	3.7E-10	4.1E-04
Co-60	2.33E-07	3E-05	8.2E-10	2.7E-03
Unidentified Beta	7.28E-07	1E-07	2.6E-09	2.6E+00

TOTAL 1.07E-06

Total of Limit Released: 2.57 %

Total of Activity Released: 32.60 uCi

Year to date activity Released 32.60 uCi

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Buffalo Materials Research Center

Table 2 97-02 10K Tank

BMRC	**Waste Tank Release to Sanitary Sewer Report**
Release Number:	97-02
From:	10K Tank
Month:	Mar-97

Amount Released: 8900 gal.
3.38E+07 ml

Date of Release: 11/21/97

Nuclide	Tank (uCi/ml)	Monthly Limit (uCi/ml)	Release (uCi/ml)	Percent of Monthly Limit
H-3	5.46E-06	1E-02	2.1E-08	2.1E-04
Co-60	9.89E-07	3E-05	3.9E-09	1.3E-02
Ag-108m	7.07E-08	9E-05	2.8E-10	3.1E-04
Cs-137 Sb-124 Sb-125	1.83E-06 9.23E-08 4.29E-07	1E-05 7E-05 3E-04	7.1E-09 3.6E-10 1.7E-09	7.1E-02 5.1E-04 5.6E-04
Unidentified Beta	3.34E-06	1E-07	1.3E-08	1.3E+01

TOTAL 1.22E-05

Total of Limit Released: 13.12 %

Total of activity Released: 412.98 uCi

Year to date activity Released 445.58 uCi

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Table 3 – 1997 Yearly Releases to the Sanitary Sewer

Nuclide	Quantity Released (Ci)	Average Annual Concentration (uCi/ml)
H-3	1.85E-04	1.8E-09
Co-60	4.06E-05	3.9E-10
Ag-108m	5.60E-06	5.4E-11
Sb-124	3.12E-06	3.0E-11
Sb-125	1.45E-05	1.4E-10
Cs-137	6.19E-05	5.9E-10
Unidentified Beta	1.35E-04	1.3E-09

TOTAL 0.446 mCi

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Table 4 - 1997 Whole Body Exposure Summary

Total Whole Body Dose (Rem)	BMRC Staff	Public Safety Dosimeters	Visitors Badges	Fuel Handler Badge
None Measurable	9	2	4	1
0.010 to 0.100	1	0	0	0
0.101 to 0.300	0	0	0	0
> 0.300	0	0	0	0

Table 5 - 1997 Extremity Exposure Summary

Total Extremity Dose (Rem)	BMRC Staff
None Measurable	4
0.010 to 0.100	3
0.101 to 0.300	2
> 0.300	0

Table 6 - Contamination Detected During Building Surveys in 1997

Range (dpm)	Unposted Areas or Equipment # of Occurrences
> 5000	2
1001 – 4999	0
501 – 1000	0
200 – 500	2