Saint Mary's University
OF MINNESOTA

March 31, 2005

Mike,

Here are the answers to those questions you asked in your letter about our telephone conversation. I answered them in the same order as they were asked. I am redoing the surveys and making them more complete as we discussed.

Hopefully we would be ready for an inspection around the middle of April. I will fill in the report as we go along and will not send it until your visitation. That way , if I have to add anything, it will be comparatively easy to modify it .

Thanks again for your help.

Bro Jerome Rademacher

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IN ANSWER TO YOUR REQUEST FOR ADDITIONAL INFORMATION REGARDING OUR LICENSE TERMINATION REQUEST I OFFER THE FOLLOWING INFORMATION IN ANSWER TO EACH OF THE QUESTIONS ASKED.

1.and 2. Account for each of the past licenses used prior to the present license.

22-00027-03: The Cobalt 60 sources mention in this license were not here when the present RSO came in 1974. As per the last page of that document , the Co-60 was transferred to the College of St. Theresa, Winona, MN License number 22-3475-1. This document is dated April 4, 1966.

22-00027-04: According to the certification received and accepted on April 2, 1965, the items in this license were disposed of in compliance with the provisions of 10 CFR 20.

22-00027-05: Some of these items were not possessed and the other ones were carried over to the new license, 22-00027-06, and their disposal was taken care of under that last license and its various amendments.

Rooms and areas that were previously use in the radiological program were identified and are now included in the survey information. Many of these have been renovated with the addition of Brother Charles Hall in 1987. This is discussed in the survey results.

To the knowledge of the present RSO no unsealed Am -241 source was ever owned or used by the school . We did have a 50 mCi sealed source that was used as an XRF source and not an alpha source. It was an Isotope Products source #ANT 241-50 and was transferred to the University of MN (License # 22-00187-46 in about August of 2003)

3. Only one burial site is known on campus and that is described in the letter of Feb 15th, 1979. The record of this burial has been recovered and the data has been plugged into the Argonne National Laboratory RESRAD program with the following results :

4. After speaking with the maintenance department it was determined that there are no potential collection points downstream of the disposal points in either the sewage or the air system. Moreover the total radioactive quantities involve in each disposal was rather small.

All radioactive waste was disposed of in the new radiation room in 232 Brother Charles Hall.

This has two sinks only one of which is routinely used for disposal. These were the two traps sampled and not contamination was found. Prior to the building of Bro. Charles Hall the radioisotope room was room 212 of Hoffman Hall. This room was carefully surveyed when it was decommissioned but no records of this survey were maintained. Therefore this room was resurveyed as a result of this decommissioning process. The results are given in the decommissioning forms. Since the sink and hood were removed they could not be tested. No radioactive gases were ever used in the hood.

The hood in room 140 Brother Charles Hall was resurveyed the small positive result was found to be insignificant. It was in the Tritium channels with a very high luminescence factor and was very much below the decommission levels for general use given in NUREG 1757 Vol 1 Rev 1 Table B1.

5. Brother Rademacher has provided more detail in the new room diagrams as requested. A detailed grid was used in the "affected area" rooms surveyed as result of this conversation. If a grid was not used a justification is given. Generally a grid was not used in "unaffected areas", i.e. in areas where only sealed sources were used or where only very short half life isotopes are used. Any area were unsealed sources of half-life greater than three weeks were used was designated an "affected area." It has been well over a year since we have performed any experiments with these isotopes. The results of these additional surveys are included in the revised survey results as we resubmitted our NRC 314 form.

6.

A. Describe or provide the procedure for conducting the surveys. See attached decommissioning form (NRC 314) In compliance with request by the NRC all future wipes will be wet wipes. The wipes done in the radiation room were dry wipes

B. Survey done in the area of the former neutron source was done with our Model 3 Ludlum survey meter #95676 Using Model 44-9 serial #93674 This instrument was recalibrated on March 27, 2005 with the following results at one inch.

C-14 NEN 0.1 uCi gave 2500 cpm on the X1 scale (about 1% efficiency)
Sr-90 NEN 0.01 uCi gave 3000 cpm on the X1 scale(about 10% efficiency)
Cs-137 NEN 0.48uCi gave 5400cpm on the X1 scale(about 0.25% efficiency)

All more recent surveys were done with this instrument and the comparison method was used to determine the degree of contamination. It is realized that this was not a terribly accurate calibration but if contamination was found it would be sufficient. The wipes were again counted at the University of MN with the calibration data as given in the report NRC 314 .

C. The animal room has not been used for radiation experiments for the past 15 years but a survey was performed to verify lack of contamination.

D. From the above data taken in the lab, the 44-9 probe has about a 1% efficiency for C-14, a 10% efficiency for Sr-90 and about a 5% efficiency for Cs-137 at 1 inch which is about the distance we placed the probe above the surface.

E .All scintillation counter reading are in DPM .

F. The efficiency of the scintillation counter for H-3 is given at about 65% We have used a value of 25% because of the presence of filter paper and cloudiness. This is almost a factor of 3 which we feel is fairly conservative.

7. There were never any animals or other organic materials incinerated at the site except for the three recorded burns of Liquid Scintillation fluids containing C-14 and H-3 . These were the older cocktails and contained Toluene and therefore could not be put down the drain. With the advent of environmentally benign cocktails we stopped the process of incineration. The three burns took place on 3/23/82, 2/1/85, and 10/4/87. In each case there was less than 10 mCi of H-3 and C-14 which was mixed with over 5,000 gallons of fuel oil (they were 10,000 gallon tanks) The fuel was eventually burned in the University boilers.

Using the following simple calculation we can see that this is well below the .05 uCi/gm limit.

$$\frac{10\ mCi\ x\ 1000 uCi / mCi}{5000\ gal\ x\ 28{,}000 ml / gal\ x\ 0.75 g / ml} = 9.5 x 10^{-5}\ uCi / g$$

In each case the total activity was much less than the 10mCi used in the calculation and the circulating pumps in the fuel tanks guaranteed that it was thoroughly mixed before burning.

I believe that with the above comments on the questions posed and the addition of the areas surveyed we have addressed all of your concerns. Please let me know if I can be of further help.

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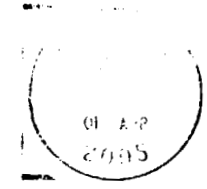
Brother Jerome Radenbacher



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