MIAMI UNIVERSITY

OXFORD, OHIO 45056

OFFICE OF INSTRUCTIONAL RESOURCES PLANNING

Telephone (513) 529-6013

October 12, 1981

Dr. John W. Cooper, Ph.D., Chief Regional Licensing Section Material Licensing Branch Division of Fuel Cycle and Material Safety U.S. Nuclear Regulatory Commission Glen Ellyn, Illinois 60137

Dear Dr. Cooper:

We wish to amend by-product material license number 34-01329-07 in order to allow the incineration of low level radioactive waste.

The following information is submitted pursuant to NRC instructions, revised October 3, 1979, entitled "Information Required for Commission Approval of Treatment Or Disposal By Incineration":

 Incineration will be conducted in our new coal fired boilers. The minimum air flow rate per boiler is 7700 cfm. The maximum air flow rate is 60,000 cfm. Minimum air flow calculations were used for compliance with Section 20.106 of 10 CFR 20.

Pursuant to appendix B, Table II, Column 1, the maximum permissable air concentration of 3H in an unrestricted area is 2 x 10-7 uCi/ml when averaged over one year. Our minimum daily air flow rate is 1.1 x 107 ft3/day or 3.14 x 10¹¹ ml/day. (3.14 x 10^{11} ml.day) x (2 x 10^{7} uCi/ml)

= 6.28 x 10⁴ uCi/day, or the maximum allowable tritium we may incinerate for our minimum flow rate. Similar calculations give us the following results for the most commonly used isotopes. Other isotopes will be treated in the same manner.

SOTOPE	TABLE II COL I	uCi/day
14	1×10 ⁻⁷	31,200.0
125,	8×10 ⁻¹¹	24.96
35,	9×10 ⁻⁹	2,808.8
5950	5×10-9	1,560.0
32	2×10 ⁻⁹	628.0

We intend to use decay in storage (see accompanying amendment request) as the major means of disposal for isotopes such as 1251 and 32p. Thus the above calculation represents an indication of the capacity to incinerate low level radioactive waste but are not expected to be utilized to this extent.

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- 2 ε 3) The incinerator stack height is 150 feet, and the nearest buildings are 150 feet and 250 feet away. There are no air intake ducts near the incinerator. With air flow as stated and calculated above, the gaseous effluent does not exceed the values given in Table 11, Appendix B for a 24 hour period.
 - 4) We do not anticipate exceeding 10% of the maximum limits specified for air in Appendix B, Table 11, 10 CFR 20, when averaged over one year. Specific yearly totals for the radionuclides listed in item 1) will be less than the daily values multiplied by 36 (10% of 365 days).

These yearly values would then be:

3,	2260 mCi
14	1123. mCi
125,	0.9 mCi
35,	101 mCi
595	56 mCi
32,0	23 mCi

5) Over 1,000 pounds of coal is the minimum amount burned on the average, of each hour. Two percent remains as ash that is, 2.15 x 10⁴ gram per day. Our records show that we have shipped 10 mCi of tritium yearly to licensed dump sites. If we burned 50 days during the year we should be able to burn 55 mCi or 1.1 mCi per day and not exceed .05 mCi per gram of ash if all the tritium remains in the ash.

Since the coal fired boilers are new, it is possible to calculate from the constantly recorded data, during incineration, the parameters of coal utilized and air flow for a twenty four hour period. We will select the 24 hour period of the burn so we do not exceed the limits for ash or air flow dilution when considering the known radioactive content of the day's burning. Ash residues will not exceed the concentrations (in terms of microcuries per gram) specified in Appendix B, Table 11, 10 CFR 20.

- 6) The incinerator ash is removed by an automativ vacuum system. It is stored in a large silo which represents another dilution of uCi/gram. It is loaded into trucks by gravity flow and then buried. Personnel do not handle the ash.
- 7) Personnel will be instructed not to handle the ash. In case of a spill the ash will be cleaned up under supervision of the Radiation Safety Officer.
- The limited exposure to personnel to the ash indicates that no extra procedures are required to prevent over-exposure.

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The actual placement of the radioactive material in the incinerator unit will be done by a responsible investigator (Miami University Radiation Safety Manual) and no other personal training should be required.

9) The number of weekly and yearly burnings will depend upon the activity disposed per day (cf. items 1 and 5) and for the year (item 4). We do not anticipate more than 2 to 3 burnings per week, 6 burnings in any given month or more than 50 burnings per year.

Sincerely,

mald W. freich

R. W. Treick Chairman, Radiation Control Committee

Lloyd Googin

Vice President, Finance & Business Affairs

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