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DEMONSTRATION OF COMPLIANCE WITH NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) - FEED MATERIALS PRODUCTION CENTER (FMPC)

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LETTER

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Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, Tennessee 37831

January 11, 198~~X~~8
DOE-317-88

Mr. Bill Franz, Chief, Environmental Review Branch
Planning and Management Division
U.S. EPA, Region V, Mail Code 5ME-14
230 South Dearborn Street, 14 Floor
Chicago, Illinois 60604

Dear Mr. Franz:

DEMONSTRATION OF COMPLIANCE WITH NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) - FEED MATERIALS PRODUCTION CENTER (FMPC)

One of the action items resulting from a meeting between personnel of your branch, U.S. Environmental Protection Agency (EPA) Headquarters, Westinghouse Materials Company of Ohio, Oak Ridge National Laboratory, and the Department of Energy (DOE) in Chicago on July 30, 1987, was for DOE to conduct a sensitivity study to show the effect of modeling 1986 FMPC emissions with the release of the radioactive material from a single stack at the center of the production area versus releases from the stacks at the individual facilities (plants). Enclosure 1 is a summary of this study. The summary shows that the dose to the nearest offsite individual 1,108 meters due north of the center of the production area is approximately 8% greater from a central representative stack than the dose resulting from the emissions from the stacks at seven plant facilities. This should demonstrate that the use of one central representative stack at the center of the production area is adequate for demonstrating compliance with 40 CFR 61.93 of the NESHAP regulation. The computer printouts for these calculations are provided by Enclosure 2.

It should be pointed out that the doses to the maximally exposed offsite individual calculated in the enclosed sensitivity study are a factor of approximately three (3) larger than those published in the 1986 FMPC Environmental Monitoring Report (EMR). This is because the sensitivity study use a different effective stack height, includes radium and thorium isotopes not included in the EMR, and calculates the committed dose for a 70-year period versus the 50-year period used in the EMR. The radium and thorium isotopes were included based on their ratios to uranium measured in samples taken from dust collectors in 1985. Normally, stack samples are not analyzed for these radionuclides because of the complexity of the analyses. Instead, these radionuclides are measured in composite weekly samples collected by the boundary ambient monitoring stations. The 70-year dose commitment period was used at the request of the Environmental Protection Agency (EPA), Region V. Conventually, the AIRDOS-EPA code uses a 50-year dose commitment period.

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We would appreciate your review of this study and a statement of your conclusions regarding the acceptability of modeling FMPC releases via one centrally located stack for demonstrating compliance with 40 CFR 61.93. If you have any questions or require additional information, please contact W. D. Dillow of our Environmental Protection Division at FTS 626-1354.

Sincerely,

James A. Reafsnyder
Site Manager

SE-31:Dillow

Enclosure:
1. AIRDOS-EPA/DARTAB Model Sensitivity Study
2. Computer Printouts (8) for the 1986 FMPC Stack Emissions

cc w/enclosure 1:
R. Shank, OEPA
R. F. Hodanbosi, OEPA
C. E. Schumann, SWOAPCA
L. C. Dolan, WMCO
J. C. Tseng, EH-23, FORSTL

AIRDOS-EPA/DARTAB MODEL SENSITIVITY STUDY

This parametric study is based on FMPC radionuclide emission data from calendar year 1986. It is designed to demonstrate the conservatism of modeling FMPC radionuclide emission points as a single theoretical stack, compared to a multiple stack model.

Input parameters are identical for the two AIRDOS-EPA/DARTAB models, except for emission stack parameters. One computer run models the FMPC as a single theoretical stack, located at the center of the Production Area.

For the multiple stack model, each FMPC plant which emitted radionuclides during calendar year 1986 is modeled into a theoretical stack for that plant. The theoretical stack parameters for each plant are calculated by averaging the parameters of each radionuclide emitting stack within the plant under consideration. FMPC radionuclide emissions are distributed among the multiple stacks according to FMPC Stack Discharge Report data, which categorizes all FMPC emission points by the plant in which they are located.

In the multiple stack model, Plant 8 particulate emission points are modeled into a single stack, as are Plant 8 scrubber emission points, because emissions from these two types of Plant 8 stacks are reported separately on monthly FMPC Stack Discharge Reports.

The results demonstrate that, with all other inputs held constant, the resulting dose will be greater using the single theoretical stack model than using a multiple stack model.

The results of the AIRDOS model sensitivity study are summarized in the Attachment.

ATTACHMENT

COMPARATIVE DOSES TO MAXIMALLY EXPOSED INDIVIDUAL RESULTING FROM VARIOUS AIRDOS MODELS OF FMPC EMISSION POINTS

	EFFECTIVE TOTAL-BODY	PULMONARY
SINGLE THEORETICAL STACK (Release height 17.6 meters Exit velocity 13 meters/second Stack diameter 0.5 meters)	1.2 millirems	7.4 millirems
PLANT-BY-PLANT THEORETICAL STACKS		
Plant 4	3.3 E-2	2.0 E-1
Plant 5	1.8 E-1	1.1 E-0
Plant 8	3.5 E-2	2.2 E-1
Plant 8 Scrubbers	6.9 E-1	4.3 E-0
Plant 9	4.8 E-2	3.0 E-1
Pilot Plant	2.8 E-2	1.8 E-1
Incinerator	7.5 E-2	4.7 E-1
TOTAL	1.1 millirems	6.8 millirems

Study based on FMPC radionuclide emission data from calendar year 1986.

SUMMARY OF PLANT-BY-PLANT THEORETICAL STACK PARAMETERS

	STACK HEIGHT (meters)	STACK DIAMETER (meters)	EXIT VELOCITY (m/sec)	LOCATION OF MAXIMALLY EXPOSED INDIVIDUAL (meters)
Plant 4	29.8	0.41	11.0	1108
Plant 5	17.2	0.59	15.0	1168
Plant 8	15.4	0.36	15.0	1196
Plant 8 Scrubbers	16.1	0.30	11.0	1196
Plant 9	13.4	0.88	16.0	971
Pilot Plant	15.7	0.52	13.0	1312
Incinerator	15.5	0.61	12.0+584°C	1110

Average parameters for each FMPC plant.