Region III 70-36

C-E Power Systems
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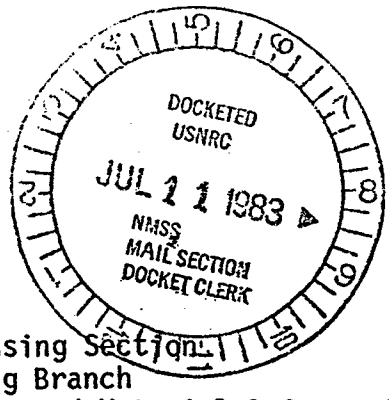
NIS/83/1027

POWER SYSTEMS



July 8, 1983

Mr. W. T. Crow
Section Leader
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and Material Safety, NMSS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket No. 70-36

Dear Mr. Crow:

Enclosed is additional occupational radiation exposure information for calendar years 1981 and 1982, as requested by members of your staff. This information supplements Chapter II.5.0 of our application for renewal of License SNM-33.

Very truly yours,

COMBUSTION ENGINEERING, INC.

H. E. Eskridge

H. E. Eskridge
Supervisor Nuclear Licensing,
Safety and Accountability

/wg
Enclosure

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OCCUPATIONAL RADIATION EXPOSURES

1981 - 1982

License No. SNM-33
Docket No. 70-36

Combustion Engineering, Inc.
Hematite, Missouri

1. External Radiation Exposures

Results of monitoring with monthly film badges were:

Annual Dose Range (Rem)	% of Personnel in Range 1981	1982
No measurable exposure	29	23
Less than 0.100	41	35
0.100 - 0.250	30	25
0.250 - 0.500	0	13
0.500 - 0.750	0	1
0.750 - 1.000	0	3
Greater than 1.000	0	0

Slightly higher external exposures during 1982 were due to increased pellet production.

2. Air Sampling

Average room air concentrations for plant areas were:

Area	Average Quarterly Concentration (10^{-10} µCi/cc) 1981 1st	1981 2nd	1981 3rd	1981 4th	1982 1st	1982 2nd	1982 3rd	1982 4th
Oxide Plant	0.02	0.02	0.01	0.02	0.03	0.15	0.08	0.10
Pellet Plant	0.01	0.01	0.01	0.05	0.03	0.15	0.03	0.06
Scrap Consolidation	0.01	0.02	0.02	0.07	0.01	0.10	0.04	0.03
Scrap Recycle	0.01	0.03	0.04	0.01	0.02	0.03	0.01	0.02
Wet Scrap Recovery	0.01	0.03	0.02	0.01	0.02	0.02	0.01	0.03
Warehouse,Laboratory	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

2. Air Sampling (continued)

Airborne exposures, as measured by lapel sampling, were:

Quarterly Exposure Range (% 40 MPC-hrs/cc)	% of Operators in Range							
	1981				1982			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Oxide Conversion								
0 - 10	33	0	17	0	0	0	0	0
10 - 25	67	83	83	100	11	11	89	33
25 - 50	0	17	0	0	78	89	11	67
50 - 100	0	0	0	0	11	0	0	0
>100	0	0	0	0	0	0	0	0
Pellet Production								
0 - 10	0	0	0	0	0	0	0	0
10 - 25	100	33	53	37	13	6	31	25
25 - 50	0	67	47	47	75	88	69	69
50 - 100	0	0	0	16	12	6	0	6
>100	0	0	0	0	0	0	0	0
Scrap Recycle/Recovery								
0 - 10	0	0	0	0	0	0	0	0
10 - 25	83	83	67	0	50	83	83	83
25 - 50	17	17	33	100	33	17	17	17
50 - 100	0	0	0	0	17	0	0	0
>100	0	0	0	0	0	0	0	0
Maintenance								
0 - 10	100	100	17	17	0	0	17	33
10 - 25	0	0	83	50	83	83	83	50
25 - 50	0	0	0	33	17	17	0	17
50 - 100	0	0	0	0	0	0	0	0
>100	0	0	0	0	0	0	0	0
Material Handling								
0 - 10	50	0	50	0	0	0	80	0
10 - 25	50	100	50	60	80	80	20	100
25 - 50	0	0	0	40	20	20	0	0
50 - 100	0	0	0	0	0	0	0	0
>100	0	0	0	0	0	0	0	0

2. Air Sampling (continued)

Operation	Average Quarterly Exposure (10^{-10} µCi-hrs/cc/wk)							
	1981				1982			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Oxide Conversion	5.7	7.0	6.7	7.8	13.6	13.1	8.2	11.0
Pellet Production	7.5	10.6	9.7	13.8	13.6	14.7	11.6	12.9
Scrap Recycle/Recovery	7.0	8.0	9.7	12.4	11.3	8.6	7.1	6.4
Maintenance	3.2	3.6	4.9	8.0	7.0	6.7	6.6	6.2
Material Handling	3.8	5.4	3.7	7.3	7.4	6.8	4.0	5.4

No weekly exposure exceeded 40 MPC-hrs. during 1981 and 1982.

3. Uranalysis

Based on a nominal monthly sampling schedule, results were:

Operation	Average Concentration (µgU/liter)	
	1981	1982
Oxide Conversion	5.9	5.3
Pellet Production	5.2	4.0
Scrap Recycle/Recovery	5.0	3.9
Maintenance	5.9	5.0
Material Handling	6.6	4.0

4. In-Vivo Counting

Results for 1981 and 1982 were:

Range (µg U-235)	% of Operators in Range 1981	1982
<50	64	74
50 - 100	31	21
100 - 125	5	5
125 - 240	0	0
>240	0	0

5. Abnormal Occurrences

The only incidents occurring during 1981 and 1982 were minor spills and leaks, which are to be expected in handling large quantities of low-enriched uranium.

6. Measures to Reduce Exposures

Numerous changes to equipment and procedures have been made to reduce exposures since Combustion Engineering acquired the Hematite facility in 1974. These changes included redesigned containment hoods, improvements to material transfer systems, new valves and gasketing materials, improved ventilation and airflow patterns, increased use of local ventilation and respiratory protection. These changes have been documented in previous submissions and NRC Region III Inspection reports.

Specific actions taken during 1981 and 1982 included:

a. Provided separate vacuum downdrafts and additional make-up air to improve air flow patterns at pellet presses. Installed continuous air monitor at presses.

b. New agglomeration feed hood and pneumatic transfer system to eliminate manual handling installed. Agglomerated press feed batch size increased to reduce handling of feed hoppers.

c. Ventilated automatic pellet feed installed at grinder.

d. New filtered stack installed to increase hood face velocities in wet recovery and incinerator areas.

e. Auxiliary blowers installed for draft improvement on incinerator and wet recovery area.