PPR

ENVIRON, FILE (NEPA)

Docket No. 50-263

JUN 14 1972

G. W. Knighton, Chief, Environmental Projects Branch #1, L

REVIEW OF MONTICELLO PRELIMINARY DETAILED ENVIRONMENTAL STATEMENT

We reviewed the Monticello Preliminary Draft Environmental Statement prepared by Batelle. In the short time at our disposal we did not uncover any gross errors in the dose evaluations. We have to reemphasize that the dose of 140 mrem to a child's thyroid is unrealistic. In any case the nonaugmented system and associated potential level of exposure cannot continue beyond this year.

Our marked up copy of the radiological impact section was transmitted to your Project Leader, J. Youngblood, informally on May 23, 1972.

Jacob Kastner

Jacob Kastner, Chief
Radiological Assessment Branch, L

cc: J. Youngblood, EP #2, w/encl.

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Form AEC-318 (Rev. 9-53) AECM 0240

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1. Dose to the Individual

The persons most likely to receive the highest radiation dose are those who reside closest to the site, go fishing, boating, or swimming in the Mississippi River downstream of the plant, and drink milk produced at farms near the plant site. It was assumed that these individuals consumed 7.3 kg of fish and 7.3 kg of molluscs* per year 24 hr after they have been caught from waters containing plant effluent water at about a 3 to 1 dilution. The annual total-body dose from consumption of these foods would be about 0.2 mrem/yr. Doses to the other body organs would be somewhat less as shown in Table V-5.

The individual who spends 500 hr/yr fishing from the river shoreline harvesting his 7.3 kg of fish and 7.3 kg of molluscs would also receive an external exposure to the total body of about 0.3 mrem/yr, principally from cesium deposited in the silt along the shoreline.

Those individuals who spend 100 hr/yr swimming in the parks which are within the plant boundary and downstream of the outfall would receive a dose to the total body of about 3×10^{-4} mrem/yr. Canoers who use the section of the Mississippi River just downstream of the plant for a total of 100 hr/yr would receive a total body dose of about 1×10^{-4} mrem/yr.

The Twin-Cities resident consuming 2 liters/day of water drawn from the Mississippi River below the plant would receive an estimated total-body dose of 0.1 mrem/yr.** The total dose received from all pathways associated with the liquid effluent of the plant (summarized in Table V-5) was estimated to be 0.5 mrem/yr to the total body.

The maximum exposure rate at the fenced boundary of the plant resulting from submersion in the gaseous effluent released from the plant occurs in the SSE direction. At this location the annual average atmospheric dilution factor was calculated to be 4.7×10^{-6} sec $\cdot$ m^{-3} for ground level releases (i.e., from the turbine building and gland seal) and 1.3×10^{-7} sec $\cdot$ m^{-3} for stack releases (i.e., from the main condenser). Assuming continuous occupancy the total-body dose at this location would be 1.0 mrem/yr. The dose to the skin would be somewhat higher (2.2 mrem/yr) because of the additional contribution from the beta radiation.

MODIFIED SECTION

*Fresh water molluscs are not now abundant near the plant due to a parasitic infection. Their use as a food item is illustrative but unlikely.

**Uniform mixing was assumed as was a dilution factor of 0.14: (645 cfs plant flow ÷ (4600 cfs river flow).

The maximum exposure rate at an occupied location occurs at the nearest farmhouse located 0.8 mile SSE of the plant, where the atmospheric dilution factor (X/Q) was 2.3×10^{-6} sec $\cdot$ m^{-3} for ground level releases and $1.0 \times 10^{-}$ sec/m^3 for stack releases. Assuming continuous occupancy, the dose to the total-body at this location would be 0.65 mrem/yr. The dose to the skin would be somewhat higher (1.3 mrem/yr) because of the additional contribution from the beta radiation of the radionuclides released. The annual average air concentrations of ^{131}I and ^{133}I at this farm were estimated to be 4.2×10^{-2} and 2.5×10^{-8} pCi/m^3, respectively. Doses to the thyroids of adults and children from inhalation of the ^{131}I and ^{133}I in the air at this farm would be 0.50 and 0.60 mrem/yr, respectively.

The maximum concentration of ^{131}I in milk would also occur at this nearby farm. The dose to the thyroid of an infant consuming milk produced on this farm was estimated to be 67 mrem/yr (assuming that the cow grazed on fresh pasture for 5 months/yr). The dose to the thyroid of an adult consuming the same milk was estimated to be 8 mrem/yr.

Until the augmented gaseous waste holdup system is operational the dose to the infant's thyroid could be expected to be 140 mrem/yr. However, based on experience during the first six months of operation this dose is estimated to be about 8 mrem for the first year of operation.

The reason that the expected annual thyroid dose is not markedly reduced following installation of the augmented radwaste system is because a significant fraction of the iodines are released to the atmosphere via the turbine building vent rather than through the augmented system. However, the applicant must assure that effluents will meet the requirements of proposed Appendix I, 10 CFR 50, as formalized.

The combined annual dose to hypothetical individuals who would receive the most exposure from the several different pathways is about 1.2 mrem to the total body, almost entirely from air-submersion.