BALTIMORE GAS AND ELECTRIC COMPANY

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ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

October 30, 1979

Mr. William P. Gammill
Director for Operating Reactor Projects
Division of Operating Reactors
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Gammill:

In response to your letter dated September 17, 1979, regarding conformance with the provisions of 40 CFR Part 190, this letter will demonstrate how we will show compliance with these provisions.

In October 1976, Tera Corporation submitted a report to Baltimore Gas & Electric Company on the radiological impact of Calvert Cliffs with regard to Appendix I requirements. This report was subsequently submitted to the Nuclear Regulatory Commission as our response for Appendix I. This report shows that the radiological impact of the plant will conform with the provisions of 40 CFR Part 190. Table 1 shows a summary of the findings of the report.

Although we feel no further action is required, we will have a radiological assessment of our releases performed on a quarterly basis. This quarterly assessment will be summed for a twelve month period enabling us to evaluate the dose commitment to any real individual over 12 consecutive months.

Methodology employed in calculating doses from both liquid and gaseous effluents is that prescribed in USNRC Regulatory Guide 1.109, as embodied by the Commission's LADTAP and GASPAR computer codes. Both codes were originally developed to evaluate annual doses from nuclear power plants, based on total yearly emissions, for the purposes of evaluating compliance with Appendix I to 10 CFR 50. The same methodology can be applied to the evaluation of doses from radioactive materials released over a shorter period of time, under the assumption that isotopes released will be present in equilibrium concentrations in all components of each exposure pathway over the release period. For some pathways, components, and isotopes this represents a conservative assumption, since equilibrium throughout a pathway may

not be reached. Bioaccumulation factors, consumption and usage rates, transport times, and dose conversion factors to be utilized are those presented in Regulatory Guide 1.109.

Dilution factors (x/Q's) for batch releases will be calculated for each location for each release, based on actual meteorological data taken during the release period. An hourly x/Q value will be calculated for a given location for each hour during which gaseous effluents are vented. A zero value is assigned when the hourly wind blows in a sector of no interest. An average x/Q for the location for the release period will be calculated by summing the hourly x/Q values and dividing by the number of hours in the release period in which venting took place.

Continuous releases will be summed and the isotope information based on weekly periods. Therefore, for each week during this period, weekly average x/Q values for the receptor points of interest will be calculated. These values will then be adjusted to reflect the possibility of fumigation. For hours with winds blowing towards a sector of no interest, a zero value will be assigned.

All gamma immersion doses will be calculated based on submersion in a semi-infinite cloud with uniform concentrations based on ground level x/Q values, regardless of whether the meteorological data is indicative of ground level, elevated or mixed mode releases.

Doses from liquid releases will be calculated for fish and invertebrate ingestion and shoreline exposure pathways. A dilution factor of 5 will be used for all pathways, and no credit will be taken for radioactive decay in transit from the outfall structure to the point of exposure. A circulating water flow of $1.231 \times 10^6$ gpm will be used for all calculations.

If you have any further questions regarding this matter, please do not hesitate to contact us.

Sincerely,

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Arthur E. Lundvall, Jr.
Vice President - Supply

AEL/LBR/PTC/nlb

Attachment

# TABLE 1

Comparison of Appendix I (May 5, 1975) and
The Staff's Proposed Appendix I (RM 50-2, February 1974)
to Calculated "Maximum Individual" Doses

| | | | Appendix I | RM 50-2 | Calvert Cliffs Elevated Release Case (3) | Calvert Cliffs Ground Level Release Case (3) |
|---|---|---|---|---|---|---|
| Sec II.A | Liquid Effluents | (Total Body) | 3 mrem/reactor | 5 mrem/site (total body or any organ) | 0.004 mrem | 0.004 mrem |
| | | (Any Organ) (All Pathways) | 10 mrem/reactor | 5 Ci/reactor(1) | 0.007 mrem (liver)<br>0.62 Curies/reactor | 0.007 mrem (liver)<br>0.62 Curies/reactor |
| Sec II.B.1 | Gaseous Effluents | (Air Dose) | 10 mrad γ/reactor | 10 mrad γ/site | 0.06 mrad | 1.2 mrad |
| | | (Air Dose) | 20 mrad β/reactor | 20 mrad β/site | 0.24 mrad | 4.9 mrad |
| or Sec II.B.2 | Gaseous Effluents(2) | (Total Body) | 5 mrem/reactor | 5 mrem/site | 0.02 mrem | 0.37 mrem |
| | | (Skin) | 15 mrem/reactor | 15 mrem/site | 0.09 mrem | 1.7 mrem |
| Sec II.C | Iodine and Particulates | (Any Organ) (All Pathways) | 15 mrem/reactor | 15 mrem/site<br>1 Ci/reactor I-131 | 0.65 mrem<br>0.01 Ci/reactor | 1.2 mrem<br>0.01 Ci/reactor |

(1) Excluding tritium and dissolved noble gases.

(2) Higher quantities may be permitted if assured that doses to any individual in an unrestricted area will be less than these values.

(3) Calculated doses are for two-unit opeations.