and Licensing, of NUMEC concerning the need for experimental data for an air surveillance program at the NUMEC Apollo plant[6] and authorization by the Atomic Energy Commission for the discharge of radioactive materials in concentrations exceeding 10 CFR Part 20 limits.[7]

By application dated November 13, 1968, and supplement dated March 5, 1969, and pursuant to 10 CFR 20.106(b), NUMEC requested that License SNM–145 be amended to permit concentrations up to 100 times the limits specified in Part 20, Appendix B, Table II, in any stack effluent, provided that concentrations at the roof edge and in the local environment complied with 10 CFR Part 20 limits. By License Amendment 31, dated May 26, 1969, the AEC authorized NUMEC to discharge radioactive material from any stack, in concentrations up to 100 times the values specified in Appendix B, Table II, of 10 CFR Part 20[8] subject to the following conditions:

(a) Concentrations of radioactive material measured by the continuously operating air samplers positioned at the plant roof perimeter shall not exceed the values specified in Appendix B, Table II, of 10 CFR Part 20; and

(b) an environmental air sampling program shall be conducted in the neighboring unrestricted areas[9] of the plant.

Accordingly, even though NUMEC was authorized to discharge *at the stack* up to 100 times the value specified in Appendix B, Table II, NUMEC was still required to meet the limits *at the site boundary* (*see* footnote 8). Moreover, NUMEC was required to meet these same values at the plant roof perimeter.

To evaluate the Intervenors' concern about the alleged contamination in the general vicinity of the Kepple Hill and Riverview areas of Parks Township, the staff estimated the average airborne uranium concentrations using the results from the environmental monitoring program, which was a condition of the License. The NRC staff calculated the average airborne uranium concentrations to be 3.6×10^{-13}uCi/cc.[10] This calculated value is less than one tenth of the maximum permissible concentration in air for insoluble uranium-238 and uranium-235; the requirement for unrestricted air effluent set forth in 10 CFR Part 20, Appendix B, Table II. Accordingly, the releases from the facility were within 10 CFR Part 20 requirements for unrestricted release and, therefore, were not a safety concern.

The NRC staff also estimated the potential contamination of soil outside the plant boundary from facility operations.[11] Using conservative assumptions, the Commission staff calculated a maximum concentration of 12 pCi per gram of soil. This is less than the Commission's current release criteria for uranium.[12]

The Commission staff also reviewed environmental radiation monitoring data collected during the facility's period of operation. Environmental radiation monitoring has been conducted at the Apollo site since 1968. Monitoring programs included measurements of radioactive materials in the environment (river water, and sediment, air, soil, and vegetation) and thermoluminescent dosimetry (TLD) measurements of direct radiation in the environment. Radiological monitoring stations have been active in the Apollo facility area for as long as three decades, monitoring the Allegheny and Kiskiminetas Rivers and various tributaries, as well as other surface waters and ground water. These include Commission, State, and B&W stations. Based on its review of this data, the Commission staff concludes that operation of the Apollo facility did not result in any significant changes to normal background levels outside the immediate site area.

The Commission staff also reviewed the results of an aerial radiological survey to measure gamma radiation [13] levels in the area of the Apollo facility. At the request of the Commission, the survey was conducted by EG&G Energy Measurement Group from June 15–19, 1981. The survey data identified only background levels of radiation.

In summary, the Commission staff calculated the potential airborne uranium concentration and potential contamination of soil, reviewed the environmental monitoring and aerial radiological survey data, and concluded that the radioactive releases from the Apollo facility have been within regulatory limits and have not resulted in concentrations of radioactivity in the soil greater than the NRC release criteria stated in the Branch Technical Position (*see* footnote 12). In reaching this conclusion, the staff took into account the fact that in 1969, the AEC authorized NUMEC to release at the stack, radioactive materials in concentrations up to 100 times the values (applicable at the site boundary) listed in Appendix B of 10 CFR Part 20. The Intervenors' request that the Commission test for radiological contamination in the general vicinity of Kepple Hill and Riverview in Parks Township is granted to the extent of the review described above. However, the Intervenors have failed to raise any substantial health or safety issues. Therefore, no further action is warranted.

2. Investigate potential radiological contamination on the Farmers Delight Dairy Farm located in the vicinity of the Parks Township facility.

In its request for the Commission to investigate radiological contamination on the Farmers Delight Dairy Farm, the Intervenors assert that information contained in a U.S. Department of Agriculture (USDA) report entitled NUMEC–1966 indicates that cattle on the farm are having thyroid problems and that radionuclides are showing up in the cows' milk. The Intervenors indicate that the report was read to them over the telephone by a reference librarian at the USDA Library in Beltsville, Maryland. The Intervenors also assert that the report ''vanished'' from that Library.

To evaluate the NUMEC–1966 report, the Commission staff searched its files,

[6] One of the sub-areas of concern accepted as an issue in the informal hearing was ''[w]hether B&W Management practices as manifested by the management of the Apollo facility threaten offsite releases of radiation from the Park Township facility.'' LBP–94–12, 39 NRC, 215, 222–23 (1994).

[7] Prior to January 1994, NRC regulations for radioactivity in effluents to unrestricted areas were contained in 10 CFR 20.106. The current requirements are found in 10 CFR 1302. 10 CFR 20.106(a) limited radioactivity in air effluents to unrestricted areas to less than those listed in Appendix B, Table II, except as authorized in 10 CFR 20.106(b). 10 CFR 20.106(b) allowed licensees to propose limits higher than those specified in 10 CFR 20.106(a), if certain conditions were met. 10 CFR 20.106(d) clarified that the limits listed in Appendix B, Table II, apply at the boundary of the restricted area and not at the stack discharge point.

[8] The values set forth in 10 CFR Part 20, Appendix B, Table II, are the regulatory limits applicable at the site boundary, not at the stack.

[9] 10 CFR 20.1003 defines ''unrestricted area'' as ''. . . an area, access to which is neither limited nor controlled by the licensee.'' Prior to January 1, 1994, an unrestricted area was defined as ''. . . any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.''

[10] An estimate of the average airborne uranium concentration can be calculated using a uranium deposition rate of 20 pCi/Ft_2/week (measured by NUMEC during plant operation) and assuming a gravitational settlement rate of 0.001 meters per second.

[11] An estimate of the soil uranium concentration can be calculated using a uranium deposition rate of 20 pCi/Ft_2/week (measured by NUMEC during plant operation) and assuming a 1cm depth, a soil density of 1.5g cm_{-3}, and a 15-year operating period at Apollo.

[12] The current release criteria for uranium, which is 30 pCi per gram, is set forth in the Commission's ''Branch Technical Position'' (BTP) published in the **Federal Register**, October 23, 1981.

[13] Gamma radiation is electromagnetic photons originating from the nucleus of an atom. Gamma rays are similar to x-rays.