UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

September 6, 1991

Roland G. Fletcher, Administrator
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224

Dear Mr. Fletcher:

During the NRC's meeting with members of your staff on July 17, 1991, it was suggested that the NRC could provide the State with guidance in resolving a number of technical areas of dispute involving the application of regulatory limits to Neutron Products, Inc. (NPI) in Dickerson, Maryland. On August 30, 1991, I received a document entitled, "MDE-NPI Issues of Disagreement" which summarized the positions of the State ond NPI with regard to these issues. A copy of this document is attached to this letter. I have reviewed this document and provide the following guidance with regard to these issues.

1. "Annual radiation dose at facility boundary > 500 mRem at boundary."

Section D.105(b) of the Maryland regulations provides that "(a)ny person may apply to the agency for proposed limits upon level of radiation in unrestricted areas in excess of those specified in D.105(a) resulting from the applicant's possession or use of sources of radiation. Such applications should include information as to anticipated average radiation levels and anticipated occupancy times for each unrestricted area involved. The Agency will approve the proposed limits if the applicant demonstrates to the satisfaction of the Agency that the proposed limits are not likely to cause any individual to receive a dose to the whole body in any period of one calendar year in excess of 0.5 rem."

This regulation permits NPI to exceed 2 millirem in one hour and 100 millirem in any 7 consecutive days (5000 millirem per year) at the facility boundary if NPI can demonstrate that no individual will receive more than 500 millirem per year. This dose limit applies to a real dose to a real person, rather than a dose to a hypothetical individual. However, as you are aware, the recent revision to 10 CFR Part 20 contains a new public dose limit of 100 millirem per year. Additionally, the rules covering an application for an exemption in the revised 10 CFR part 20 (10 CFR 20.1301[c]) (enclosed) require additional information to support the application, including the need for the exemption, the licensee's program to control and assess the dose, and the licensee's ALARA program. Since this regulation must be adopted by Maryland no later

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than 1994, these future requirements should be kept in mind when reviewing a proposed request for an exemption to the dose limits in D.105(a).

2. "Soil concentrations (cobalt-60 contamination of ground areas):
-Dose rate survey at dry pond is >250 uR/hr
-Cobalt-60 is not germane to the environment."

4. "Fence installation around dry pond."

The guidance provided previously by the NRC referred to acceptable radiation and contamination above naturally occurring backround levels in areas released for unrestricted use. If NPI constructs a fence that adequately restricts access to the dry pond area, higher levels of radiation and contamination may be permitted in this area. Unless NPI can restrict access, the State should continue its efforts to require NPI to reduce the radiation and contamination levels to those acceptable for unrestricted areas.

3. "Soil in the sump (LAA) cobalt-60 contamination at 8 mRem/hr."

Since this contamination is in a restricted area of the facility, there are no explicit guidelines or limits on acceptable levels of radiation and contamination. It is important to ensure that cobalt-60 contamination in the sump does not result in unnecessary worker doses or be ignored in any eventual decommissioning of the facility. It would not be acceptable if NPI reduced the current radiation levels by simply filling the sump with concrete since this may make it more difficult to remove the sump contamination at a later date. If the licensee believes that the source of the observed levels is outside the sump, the licensee should demonstrate this, e.g., by sampling and analyzing the radioactivity levels in the soil.

5. "Consultant's Health Physics Reports"

The State included in Amendment 33 to the NPI license a requirement for independent monthly audits for a 6-month period. The requirement that these audits be performed by an outside consultant is important to ensure objectivity and the State should insist on compliance with this requirement.

6. "Radioactive waste/courtyard cover"

The NRC views the construction of a courtyard cover to be a worthwhile approach to reduce migration of radioactive contamination offsite. However, the NRC does not encourage plans for the indefinite interim storage of radioactive wastes at licensee's

facilities. We plan to provide you with further guidance on the NPI plan for radioactive waste storage in the near future.

During a tour of the NPI facility by Carl Kammerer, Director, Office of State Programs, and myself, the NPI president, Mr. Ransohoff stated that the State was imposing contamination action levels as regulatory limits. As we discussed during our meeting with your staff on July 17, there should be a clear distinction between action levels and regulatory limits. A licensee may establish a level of contamination which requires followup but which, if exceeded, should not be the basis for regulatory action so long as the licensee performed the required followup action. On the other hand, repeated instances of exceeding action levels may be indicative of poor management control of the radiation control program. In this circumstance, it could be appropriate for the State to require the licensee to improve its management controls. While this was not an issue listed in your document, I included it here because it was raised by the NPI during our tour of that facility.

I hope this letter clarifies the position of the NRC with regard to these issues. Please contact me if you have any further questions.

Sincerely,

Francis M. Costello

Francis M. Costello
Acting State Agreements Officer

Enclosures: 1. MDE-NPI Issues of Disagreement
2. Revised 10 CFR 20.1301

cc: V. Miller, SP

MDE-NPI ISSUES OF DISAGREEMENT

ISSUE	STATE/NRC REGULATIONS/STANDARD	NPI'S POSITION
1. Annual radiation dose at facility boundary >500 mRem at boundary.	COMAR 26.12.01.01 Sec. D.105 10 CFR 20.105 "Permissible Levels of Radiation From External Sources in Unrestricted Areas" which in part states: (1) no radiation levels in excess of 2 millirem in any one hour; or (2) no radiation levels in excess of 100 millirem in any seven consecutive days. NPI license (MD-31-025-01) Amendment #33, states that the boundary radiation exposure limit shall not exceed 500 millirem/year.	J. Ransohoff contends that he has shown that an individual cannot receive 500 millirem dose from the facility boundary. Therefore, he would like to apply to RHP for radiation levels exceeding D.105(a).
2. Soil concentrations (cobalt-60 contamination of ground areas): - Dose rate survey at dry pond is >250 uR/hr. - Cobalt-60 is not naturally occurring isotope--not germane to the environment.	NRC'S GUIDELINE LIMIT AND AMENDMENT #33 a. $\leq$ 10 microR/hr above background at 1 meter above ground surface for area (< 30' x 30'). $\leq$20 microR/hr above background for any discrete area (< 30' x 30'). b. Concentration limit for subsurface cobalt-60 contamination is 8 pCi/qm for equivalent 30' x 30'. NPI has the option to send soil samples to a consultant that has a multi-channel analyzer to determine cobalt-60.	J. Ransohoff states that the NRC guideline is questionable, since natural occurring isotopes in the soil may be adding to the soil concentration, along with cobalt-60.

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ISSUE	STATE/NRC REGULATION/STANDARD	NPI'S POSITION
3. Soil in the sump (LAA) cobalt-60 contamination at 8 mRem/hr.	a. RHP letter to NPI stating that the soil dose rate at contact must be reduced to 2 mRem/hr. b. Soil concentrations greater than 2 mRem/hr must be removed and drummed. c. Possibility--allow NPI to fill in the sump as is, but the existing dose rate must be added to the facility deed.	a. NPI wants to fill sump with concrete with no further excavation. b. NPI believes that the dose rates are "elevated" in the sump due to dose rate levels in the LAA, of which it is a part. c. Cobalt-60 does not migrate in soil/clay to the extent it will reach the water table.
4. Fence installation around NPI's dry pond.	a. RHP has given NPI approval to construct a linked fence, 8' in height around the dry pond area, in order to prevent access by the general public. b. NPI was directed to reduce soil concentration of cobalt-60 in accordance with NPI's license Amendment #33. c. Both RHP and NRC will permit increased cobalt-60 concentration levels inside the fence. d. RHP monitoring will continue for contamination beyond NPI's boundaries.	a. NPI is performing surveys and is removing soil that is found contaminated with cobalt-60. b. NPI's techs have reduced the dose rate levels, in part, through their efforts. c. NPI contends that Montgomery County will not grant them a permit to install a fence.

ISSUE	STATE/NRC REGULATION/STANDARD	NPI'S POSITION
5. Consultant's Health Physics Reports	a. Amendment #33 required that NPI's consultant submit monthly reports to the RHP for six months. For various reasons, RHP extended monthly reports requirement through the present. b. Many reports are either late or not submitted at all.	a. NPI wants to have their Radiation Safety Officers (RSO) submit monthly reports to the RHP, instead of the consultant. These reports are supposed to be reviewed by the consultant prior to submittal to RHP. b. Already, a report was submitted by Wayne Costley, a RSO at NPI, for which approval by RHP was not given. c. NPI wants the consultant to perform other, more worthy projects than submit these reports. d. NPI also states that, "I cannot make the consultant submit them to RHP".
6. Radioactive waste/courtyard cover	a. Drawings for the courtyard cover were submitted to RHP along with NPI's plan for radioactive waste storage. b. Any courtyard cover must be approved by RHP and Montgomery County, specifically a permit. c. Montgomery County is reluctant to issue NPI a permit based on past history.	a. NPI does not want to plan and ship waste because of expenses. b. NPI proposed a long time storage plan to decay radioactive waste for year 2010 and beyond. c. NPI's plan is to place radioactive waste in vaults that will be shielded as above ground storage in the covered courtyard.

ISSUE	STATE/NRC REGULATION/STANDARD	NPI'S POSITION
6. Radioactive waste/courtyard cover. (continued from last page)	d. However, after a meeting with Montgomery County officials and RHP staff at MDE, Montgomery County <u>will</u> probably issue a permit for a courtyard cover <u>only</u> upon MDE/RHP recommendation. e. With both radioactive waste/courtyard issues tied together by NPI, MDE rejected NPI's plan for long term radioactive waste storage. e. MDE wants a plan from NPI to outline radioactive waste shipments up through 12/31/92.	d. NPI regards under ground storage of radioactive waste as <u>unsafe</u>. e. Cost of current radioactive waste removal and shipment would be $3.5 million. f. NPI could "sell" this idea to the Dickerson community and Montgomery County as well. g. NPI's projected cost for a courtyard cover and total enclosure was about $650,000, a sum that would be less expensive than that of radioactive waste shipments.

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or is within 0.05 rem (0.5 mSv) of this dose, by the time the woman declares the pregnancy to the licensee, the licensee shall be deemed to be in compliance with paragraph (a) of this section if the additional dose to the embryo/fetus does not exceed 0.05 rem (0.5 mSv) during the remainder of the pregnancy.

Subpart D—Radiation Dose Limits for Individual Members of the Public

§ 20.1301 Dose limits for individual members of the public.

(a) Each licensee shall conduct operations so that—

(1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contribution from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003, and

(2) The dose in any unrestricted area from external sources does not exceed 0.002 rem (0.02 mSv) in any one hour.

(b) If the licensee permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

(c) A licensee or license applicant may apply for prior NRC authorization to operate up to an annual dose limit for an individual member of the public of 0.5 rem (5 mSv). The licensee or license applicant shall include the following information in this application:

(1) Demonstration of the need for and the expected duration of operations in excess of the limit in paragraph (a) of this section;

(2) The licensee's program to assess and control dose within the 0.5 rem (5 mSv) annual limit; and

(3) The procedures to be followed to maintain the dose as low as is reasonably achievable.

(d) In addition to the requirements of this part, a licensee subject to the provisions of EPA's generally applicable environmental radiation standards in 40 CFR Part 190 shall comply with those standards.

(e) The Commission may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee may release in effluents in order to restrict the collective dose.

§ 20.1302 Compliance with dose limits for individual members of the public.

(a) The licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301.

(b) A licensee shall show compliance with the annual dose limit in § 20.1301 by—

(1) Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit; or

(2) Demonstrating that—

(i) The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in table 2 of appendix B to §§ 20.1001–20.2401; and

(ii) If an individual were continually present in an unrestricted area, the dose from external sources would not exceed 0.002 rem (0.02 mSv) in an hour and 0.05 rem (0.5 mSv) in a year.

(c) Upon approval from the Commission, the licensee may adjust the effluent concentration values in appendix B to §§ 20.1001–20.2401, table 2, for members of the public, to take into account the actual physical and chemical characteristics of the effluents (e.g., aerosal size distribution, solubility, density, radioactive decay equilibrium, chemical form).

Subpart E—[Reserved]

Subpart F—Surveys and Monitoring

§ 20.1501 General.

(a) Each licensee shall make or cause to be made, surveys that—

(1) May be necessary for the licensee to comply with the regulations in this part; and

(2) Are reasonable under the circumstances to evaluate—

(i) The extent of radiation levels; and

(ii) Concentrations or quantities of radioactive material; and

(iii) The potential radiological hazards that could be present.

(b) The licensee shall ensure that instruments and equipment used for quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated periodically for the radiation measured.

(c) All personnel dosimeters (except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to the extremities) that require processing to determine the radiation dose and that are used by licensees to comply with § 20.1201, with other applicable provisions of this chapter, or with conditions specified in a license must be processed and evaluated by a dosimetry processor—

(1) Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

(2) Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

§ 20.1502 Conditions requiring individual monitoring of external and internal occupational dose.

Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of this part. As a minimum—

(a) Each licensee shall monitor occupational exposure to radiation and shall supply and require the use of individual monitoring devices by—

(1) Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in § 20.1201(a),

(2) Minors and declared pregnant women likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of any of the applicable limits in § 20.1207 or § 20.1208, and

(3) Individuals entering a high or very high radiation area.

(b) Each licensee shall monitor (see § 20.1204) the occupational intake of radioactive material by and assess the committed effective dose equivalent to—

(1) Adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of appendix B to §§ 20.1001–20.2401; and

(2) Minors and declared pregnant women likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.05 rem (0.5 mSv).

Subpart G—Control of Exposure From External Sources in Restricted Areas

§ 20.1601 Control of access to high radiation areas.

(a) The licensee shall ensure that each entrance or access point to a high radiation area has one or more of the following features—

(1) A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a