



DEPARTMENT OF THE ENVIRONMENT
ASSISTANT SECRETARIAT FOR
TOXICS, ENVIRONMENTAL SCIENCE AND HEALTH
CENTER FOR RADIOLOGICAL HEALTH
RADIOACTIVE MATERIAL LICENSE

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Supplementary Sheet

License No. MD-31-025-01

Amendment No. 33

Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, Maryland 20842

Pursuant to Section A.7 of COMAR 26.14.02.01, Condition 13 is hereby amended to add:

- A. A gas Proportional Portal Monitor equivalent to the Eberline PCM-1b capable of detecting 2500 dpm at one inch and 5000 dpm at three inches shall be utilized in a location approved by the Department. The monitor shall be used by all personnel who exit the Limited Access Area ("LAA"). They shall remain standing in the sensitive detection zone of the monitor for at least two full minutes. Each person shall expose his/her back, front, right and left sides to the detectors for thirty seconds each. The monitor shall be maintained and used in accordance with the manufacturer's specifications at all times. At a minimum, this monitor shall be inspected by the manufacturer in accordance with the terms of its Service Contract and a copy of the service record shall be submitted to the Center for Radiological Health (CRH). The monitor shall be maintained and used in such a manner as to ensure its ability to accurately detect levels of radioactivity of 2500 dpm on the hands and 5000 dpm on the whole body. The monitor must be fully operational and kept free from contamination at all times unless unforeseeable and unavoidable operational problems arise. The Department must be notified by telephone within one workday in the event that the portal monitor is not operational. A contingency plan describing personnel monitoring procedures for use during downtime must be submitted to the Department for review and approval prior to resuming activities in the LAA. By June 12, 1989 the portal monitor must be located in the newly constructed access and egress area as identified in Attachment 7 to plans submitted by licensee on April 21, 1989.
- B. Background radiation levels at the portal monitor shall not exceed 50 micro/R per hour unless otherwise authorized by the Department.

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C. A Health Physics Consultant shall be retained by the licensee. This Consultant shall be retained subject to the approval of the Department concerning qualifications and shall perform the following functions:

1. Perform an initial independent evaluation sufficient to satisfy the Department regarding the current radiological health program employed by licensee. Thereafter and for a six-month period commencing upon hiring, submit monthly evaluations to the Department regarding the health physics/radiation safety status of the facility as it relates to ongoing and future operations under this license. Such evaluations shall include:
 - a. Contamination Control Procedures and Methods;
 - b. Respiratory Protection Program;
 - c. Personnel Monitoring for Internal and External Radiation Exposure;
 - d. Radiological Effluent Monitoring and Control for Liquid and Particulate Releases From the Facility;
 - e. Adequacy of Air Handling Systems in the Production Areas;
 - f. Control and Identification of Radiation and High Radiation Areas, and Contaminated Equipment and Facilities;
 - g. Radiological Waste Handling, Processing and Disposition (Storage and Shipment);
 - h. Hot Cell Decontamination Methods and Procedures;
 - i. Personnel Training and Qualification; and
 - j. Management Oversight and Control of Radiological Activities.

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The initial evaluation of items a-j must be submitted to the Department prior to the commencement of any operations specified in Item P. Evaluations under this paragraph may be tailored to the scope of operations allowed under Item P; e.g., the initial evaluation may, but need not, evaluate radiological health/radiation safety under operations involving bare cobalt-60 but such an evaluation must be received and approved by the Department prior to commencement of any actions involving bare cobalt-60. Subsequent evaluations must be submitted to the Department by the last day of each calendar month. Following this six-month period, the Department shall consider reducing the reporting period to a quarterly basis.

2. Ensure that the portal monitor is properly installed and maintained;
3. Oversee the construction of the portal monitor area as required in order to assure that background radiation levels do not exceed 50 micro/R per hour;
4. For a six-month period commencing upon hiring, perform monthly evaluations of the portal monitoring area, the use of the portal monitor by employees, its functioning and the radiation safety training of employees, and submit monthly reports to the Department based upon such evaluations. These reports shall include the review of incidents of radioactive contamination above 22,000 dpm detected on personnel. Following this six-month period, the Department shall consider reducing the reporting period to a quarterly basis;
5. Oversee and participate in the design and construction of an enclosure to be installed over the courtyard area so as to provide an effective barrier against the release of radioactivity as described in Item M of this amendment; and
6. Conduct a thorough evaluation of the hot cell ventilation system currently employed by the licensee which shall be submitted to the Department. Upon receipt of this evaluation, the Department shall classify deficiencies into two categories according to the severity of their potential harm to the environment:

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- a. Deficiencies which must be remediated prior to reinitiation of hot cell operations under this license; and
- b. Deficiencies which must be corrected within a time period specified in a plan submitted by licensee and approved by the Department.

The licensee shall implement the Department's directives as defined in accordance with (a) and (b) above.

- D. A full-time trained Health Physics technician or the equivalent in duly committed fractional time technicians shall be retained subject to the approval of the Department concerning their qualifications. The licensee shall maintain a log which documents the work of the Health Physics technician. He shall perform the following functions:
1. During working hours the technician shall ensure the proper use of the portal monitor, hand-held friskers and any other devices employed to detect levels of radioactivity present on persons or items which exit the LAA;
 2. Ensure that all persons log in and out upon entering and exiting the LAA;
 3. Ensure the proper use of hand-held friskers by all persons who incur levels of contamination detected by the portal monitor;
 4. Report immediately to the Radiation Safety Officer any contamination levels above 10,000 dpm which are detected by the portal monitor, or if inoperative, under contingency monitoring. In the event that contamination is detected above 22,000 dpm such incidents must be evaluated by the RSO and must be reported to the Department in monthly reports submitted to the Department by the Health Physics Consultant. Evaluations of such incidents of contamination, shall include the name of the person contaminated and the degree of contamination detected. The Department shall be notified within two hours concerning all contaminations above 50,000 dpm which are detected by the portal monitor, or if inoperative, under contingency monitoring. During non-work hours, call (301) 243-8700 and ask the operator for "Radiation Assistance".

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5. Document, for evaluation by the RSO all probable sources of radioactive contamination of employees who incur levels of contamination in excess of 22,000 dpm.
6. Conduct radiation surveys within the entire facility in accordance with documented procedures set forth elsewhere in this license;
7. Conduct water sampling of the main source pool, and waste water generated in the LAA in accordance with NPI's documented procedures set forth elsewhere in this license; and
8. Conduct radiation surveys of soil and water contamination levels in accordance with a plan for the surveillance of radioactive contamination in surface and ground water at the plant's boundary and within a one kilometer radius of the licensee's facility. The plan shall be submitted within 30 days of the effective date of this amendment and shall include a decontamination plan, a schedule for remedial action and contingencies for obtaining access to private dwellings and commercial property.
9. Conduct radiation surveys of all personnel, vehicles, equipment and personal belongings exiting the gate of the courtyard area in accordance with the limits specified in Section A of this amendment and the U.S. Department of Transportation Regulations.
- E. Following any detection of contamination by the portal monitor, hand-held friskers capable of measuring levels of radioactivity as low as 500 dpm shall be used to detect the precise areas of contamination. Upon discovery of a level of contamination at or above 500 dpm, contaminated individuals must be promptly decontaminated to a level as low as reasonably achievable and remonitored.

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- F. Within thirty (30) days of the effective date of this amendment a "clean room" shall be established in which radioactive contamination shall be limited to less than 500 dpm per 100 cm² smearable, removable contamination on any surface area. The clean room shall be located immediately inside the entrance door to the LAA and shall provide storage space for all street clothing and equipment which should not be worn or transported into other areas of the LAA.
- G. Any clothing worn outside the LAA shall not be worn in the LAA except in the clean room. Conversely, any clothing worn in other areas of the LAA shall not be worn outside the area. Such clothing may be worn in the clean room if a thorough frisking of a person detects no contamination in excess of 2500 dpm on the hands and 5000 dpm on the whole body.
- H. Within thirty (30) days of the effective date of this amendment, the licensee shall establish and implement a detailed Radiation Safety Training Program as approved by the Department. At a minimum, this Program shall provide, on a quarterly basis, training sessions provided by the Health Physics Consultant to all employees who, under any circumstances, may have access to the LAA. Attendance at such training sessions shall be mandatory and documented.
- I. Within thirty (30) days of the effective date of this amendment, the licensee shall submit for approval by the Department a random inspection plan of the LAA and the unrestricted areas to be conducted on a monthly basis and implemented by the Radiation Safety Officer. Once approved by the Department, said plan shall be implemented immediately.
- J. The compaction of radioactive waste prior to storage or disposal is prohibited unless the Department approves of a plan submitted by the licensee for conducting this activity in a safe manner.
- K. By June 30, 1989 the licensee shall submit to the Department for approval a comprehensive plan for disposal of all low level radioactive waste. Upon approval by the Department, this plan shall be implemented.

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- L. Thermoluminescent dosimeters (TLDs) or film badges shall be placed at the facility's boundaries. Such dosimeters shall be affixed to existing boundary structures (i.e., a wall or fence) and shall be replaced on a monthly basis. Dosimeters shall be placed at a maximum of one hundred feet apart along each boundary structure. The boundary radiation exposure limit shall not exceed 500 millirem per year.
- M. In order to reduce the potential for release of radioactivity and to maintain low radioactive background levels outside the courtyard area, an enclosure shall be installed over that portion of the courtyard required to protect against the release of radioactivity. A plan to install said enclosure shall be submitted to the Department for approval within forty-five (45) days of the effective date of this amendment, excepting the period of time in which the County is considering the plan. The enclosure shall be installed within one hundred fifty (150) days of approval by the County and the Department. Its construction shall be overseen by the Health Physicist Consultant as described in Item C.
- N. Within thirty (30) days of the effective date of this amendment, the licensee shall submit a plan for evaluation and remediation of ground areas surrounding the facility. This plan shall be approved by the Health Physicist Consultant. Upon approval of the plan by the Department, said plan shall be implemented by the licensee. The criteria for acceptability of cobalt-60 contamination of ground areas are:
1. The gamma exposure at one (1) meter above the ground surface shall not exceed 10 microR/hr above background for an area greater than 30 ft x 30 ft and shall not exceed 20 microR/hr above background for any discrete area (i.e. less than 30 ft x 30 ft).
 2. The concentration limit for subsurface cobalt-60 contamination is 8 picocuries per gram above background for an equivalent area of 30 ft x 30 ft.

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Prior to approval of this plan, all soil exhibiting levels of radioactivity in excess of the above attributable to NPI, wherever found, shall be removed and properly stored/disposed of by the licensee. The Department shall be furnished with documentation of the discovery, survey dates and disposition of such radioactive material found off-site on a monthly basis.

- O. Within thirty (30) days of the effective date of this Amendment, a floor radiation monitor of a type approved by the Department shall be used on a weekly basis to detect surface levels of radioactive contamination on all surfaces within the facility outside of the LAA. Licensee shall maintain records regarding the use of this monitor.
- P. 1. Licensee may engage in the receipt of singly encapsulated cobalt-60 immediately.
2. Licensee may engage in those activities requiring the use, handling, shipment and transfer of doubly encapsulated cobalt-60 as soon as the Department has evaluated and approved of the licensee's accomplishment of conditions A, C, D, G, J and L.
3. Activity involving bare cobalt-60 or singly encapsulated cobalt-60 components or the alteration of doubly encapsulated cobalt-60 sources, particularly the removal of the outer encapsulation will be permitted as soon as conditions B, E, F, H, I, K, M, N and O are evaluated and their implementation approved by the Department.
4. The evaluations by the Department described herein shall be completed within five (5) working days of receipt of a plan or the data required or notification by the licensee that a condition has been satisfied. The Department shall promptly notify the licensee of its approval or disapproval.
- Q. Facility modifications to the access and egress area as identified in Attachment 7 to plans submitted by licensee on April 21, 1989 shall be completed by June 12, 1989.

FOR THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

Richard J. Brisson for

Roland G. Fletcher

ADMINISTRATOR, CENTER FOR RADIOLOGICAL HEALTH

Date May 23, 1989

CRF/amc *CCF*