



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

JUN. 26 1989

MEMORANDUM FOR: John E. Glenn, Chief
Medical and Commercial Use Safety Branch

FROM: Lee H. Bettenhausen, Chief
Nuclear Materials Safety Branch, Region I

SUBJECT: Target Criteria/Guidance Relative the Release of
Contaminated Soil For Unrestricted Use

In the past, we have provided guidance and direction to several licensees relative to release of contaminated soil for unrestricted use. In each of these instances, the criteria supplied was derived on a case-by-case basis, since the Commission has not yet arrived on a policy pertaining to matters below regulatory concern. While we are not uncomfortable in continuing with a case-by-case review of each instance that requires our attention, we would appreciate your review and concurrence in the basic guidance we have, and plan to continue to utilize.

Our basic policy relative to cobalt-60 contamination of soil is derived from the note to John R. White from Susan G. Bilhorn, dated September 18, 1987, enclosed. While the specific matter pertains Radiation Technology, Incorporated (RTI), we found that the guidance (i.e. 10 microR/hr at 1 meter, and 8 picocuries/g) is so conservative (when compared to Regulatory Guide 1.109, Table E-6; and NUREG/CR-0494, Appendix C) that we are prepared to use it whenever cobalt-60 soil contamination issues in unrestricted areas arise.

Such is the current situation involving an Agreement State licensee, Neutron Products Incorporated (NPI), Dickerson, Maryland. Most recently, John R. White of my staff has been requested by the State of Maryland, Department of the Environment to provide testimony on July 22, 1989, relative our evaluation of radiological conditions at the NPI facility. In the inspection of this facility on March 13-14, 1989, by Messrs. White and Nimitz of this office, it was discovered that unrestricted property (not owned or leased by NPI), adjacent to NPI's facility, contained localized spots of cobalt-60 contamination ranging as high as 1,384 picocuries/g of soil. Background radiation emanating from NPI made it impossible to quantify the resultant radiation levels at 1 meter from the ground. Therefore, it will be recommended that further radiological characterization of the property should be accomplished.

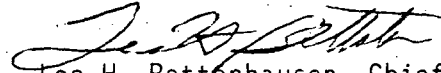
However, it is apparent to us that the State of Maryland will request Mr. White or others to discuss or provide any NRC guidance or position relative to such soil contamination. We believe that this is a fair question, and are prepared to present the guidance as described in Attachment 1 of the enclosed document. Accordingly, we would appreciate your input or comment on this guidance beforehand to assure that our position is generally consistent with any other regulatory approaches.

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We request that any response on this matter be made by July 7, 1989. Thank you for your cooperation.



Lee H. Bettenhausen, Chief
Nuclear Materials Safety Branch

Enclosure As Stated

cc:

~~JMcGrath, RI~~

MKnapp, RI

JWhite, RI

JKinneman, RI

MShanbaky, RI

11. V. Agor
September 18, 1987

NOTE TO: John White, Chief
Nuclear Materials Safety Section C

FROM: Susan G. Bilhorn

The purpose of this note is to summarize my discussions with Tass Varaklis of RTI on August 24, 1987, regarding decontamination of the RTI Rockaway facility site. Marlene Taylor and I met with Mr. Varaklis following a morning of collecting soil samples in the ephemeral stream beyond the first fence line. Also in attendance at the meeting was Jack Walden of the New Jersey Department of Environmental Protection.

Summary

- Regarding the document entitled "Remedial Action Plan for Decommissioning of the Rockaway Facility of Radiation Technology, Inc.", submitted to NRC May 3, 1987, I indicated that it appears to be a status report. It did not provide comprehensive plans for remedial action, nor did it adequately describe a complete characterization of the radiological contamination associated with the site.

- As for the CO-60 contaminated soil south of Building 61, I indicated that the staff does not find RTI's proposed concrete cover to be acceptable, as presented in the May 3 document. The action proposed constitutes on-site disposal which would require RTI to submit an application pursuant to 10 CFR 20.302. This action would also be considered a temporary disposition of the contamination and need to be reconsidered prior to release for unrestricted use. The NRC staff prefers permanent disposition of contaminated material to avoid future complications and possible rework.

Regardless of what action RTI chooses to propose for disposition of the contaminated soil in this area, RTI will need to collect additional information to adequately describe the contamination and past/potential migration of contaminated material. For example; more samples should be collected to adequately define the extent and activity of the contamination; surface drainage channels should be checked for migration of contamination, and leaching of contamination into the ground water through contact with the contaminated soil should be addressed as a potential pathway for migration.

- Inquiring as to the scope of the new document under preparation by RTI, Mr. Varaklis described it as an update to the previous Remedial Action Plan (RAP) summarizing information collected since April and changes/additions to the planned remedial actions. I provided the following information as feedback:

o RTI needs to finish a comprehensive assessment of the radiological contamination throughout the property, on and off site, prior to further development of a plan for clean-up. RTI should take positive action to assure that all radioactive contamination associated with

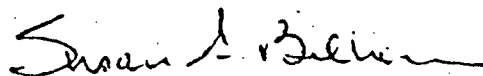
the site and characterized, especially in light of the contaminated soil recently discovered in the ephemeral stream sampled earlier the same day. A complete radiological assessment should describe the extent, type, volume, concentration, activity and potential hazard of the contaminated materials (including exposure pathways). This information will provide the basis for the Decontamination Plan that will need to be submitted to NRC staff for review and approval. The term "Decontamination" is more appropriate than "Remedial Action" in this situation.

- o I addressed the type of information that will be needed to support the Decontamination Plan and stated the Criteria for clean-up of CO-60 contaminated soil as summarized in Attachment 1.
- o I also indicated that since the soil at RTI is contamination with relatively low levels of CO-60, RTI may want to consider on-site disposal of the contaminated soil. This disposal option would require that RTI submit an application pursuant to §20.302. (NUREG 1101, Volumes I and II were provided to RTI as references on types of material that may be disposed in such a manner, methods of disposal, and staff information needs).

In response to this information, Mr. Varaklis indicated that he would postpone further development of the document in preparation and focus on completing the assessment of radiological contamination. He requested a written summary of the information I presented regarding the decontamination plan and clean-up criteria. However, he acknowledged that RTI has the responsibility for assessment and cleanup, and that it is not appropriate for the NRC staff to conduct or provide direction to those efforts.

Follow-up

A summary of the information I presented on the scope of a decontamination plan and the clean-up criteria for CO-60 contaminated soil is provided as a separate attachment (Attachment 1). I suggest that this attachment be transmitted to RTI for their use as guidance. The information presented therein was derived from previously documented staff positions/guidance and has been reviewed by Ed Shum (Fuels Cycle Safety Branch, FCMA/NMSS) for consistency. Mr. Shum is an appropriate NMSS reference on this subject.



Susan G. Bilhorn

Enclosure: As Stated

cc: J. Miller
M. Taylor

NRC FINDINGS FROM REVIEW OF NEUTRON PRODUCTS, INCORPORATED, DICKERSON, MARYLAND, MARCH 13-14, 1989.

REVIEWERS: JOHN R. WHITE, CHIEF, NUCLEAR MATERIALS SAFETY SECTION C
RONALD L. NIMITZ, SENIOR RADIATION SPECIALIST, FACILITIES RADIATION PROTECTION SECTION

SUMMARY OF FINDINGS:

1. OFF SITE SOIL CONTAMINATION RANGING FROM 0.1 TO 3.0 MILLIREM PER HOUR. THE CONTAMINATION APPEARS TO BE THE RESULT OF WATER RUNOFF FROM THE PLANT, AND HAS EFFECTED PRIVATELY HELD PROPERTY ADJACENT TO NP1.
2. THE AIR EXHAUST FROM THE HOT CELL IS VENTED TO THE ENVIRONMENT THROUGH A HEPA FILTER UNIT. HOWEVER, EFFLUENTS FROM THIS SYSTEM ARE NOT SAMPLED OR MONITORED BY CREDIBLE TECHNIQUE. CURRENTLY, RADIATION MEASUREMENTS FROM THE HEPA FILTER ARE ABOUT 3.0 R PER HOUR. RECORDS OF THE DAILY CHECK OF DIFFERENTIAL PRESSURE ACROSS THE FILTER IS CLEARLY OUT OF SPECIFICATION RELATIVE TO THE LICENSEE'S PROCEDURE. THE LICENSEE'S PROCEDURE IDENTIFIES THE NORMAL RANGE TO BE BETWEEN 1.0 AND 1.75. HOWEVER, THE DAILY LOG SHEET INDICATE THE D/P TO BE ABOUT .65 TO .75. SUCH LOW MEASUREMENTS COULD INDICATE THAT THE FILTER IS BEING BY-PASSED OR HAS BEEN PENETRATED. THE LICENSEE HAS TAKEN NO ACTION TO INVESTIGATE THE PROBLEM.
3. SEVERAL LOCALIZED SPOTS OF CONTAMINATION (ABOUT 15) WERE IDENTIFIED IN NONRESTRICTED PORTIONS OF THE PLANT, INCLUDING A 30,000 DPM SPOT ON A CHAIR IN FRANK SCHWOEDERER'S OFFICE (THE INDIVIDUAL WHO WAS PREVIOUSLY DETECTED AS CONTAMINATED AT R.E. GINNA NPS, ONTARIO, NY. OTHER HOT SPOTS RANGED FROM 10,000 TO 50,00 DPM.
4. THOUGH THE CO-60 MELTING OPERATIONS CAUSE HIGH LEVEL CONTAMINATION TO THE HOT CELL, WHICH IS SUBSEQUENTLY ENTERED AND DECONNED BY PLANT PERSONNEL, THE LICENSEE HAS NOT EVALUATED BETA EXPOSURE TO PERSONNEL OR IF EXTREMITY DOSIMETRY IS WARRANTED. THE GAMMA EXPOSURE IN THE HOT CELL AFTER MELTING OPERATIONS APPEARS TO BE BETWEEN 5 AND 15 REM PER HOUR. BETA EXPOSURE FROM CO-60 MAY BE EXPECTED TO BE HIGHER BY A FACTOR OF 4. WHILE PROTECTIVE CLOTHING IS WORN, THERE HAS BEEN NO EVALUATION PERFORMED THAT VERIFIES THE EFFECTIVENESS OF THE CLOTHING RELATIVE TO BETA PROTECTION.
5. CONTAMINATION CONTROL PRACTICES IN THE RESTRICTED AREA (LIMITED ACCESS AREA, LAA) ARE NOT COMMENSURATE WITH THE HIGH LEVELS AND POTENTIAL FOR PERSONNEL CONTAMINATION. PROTECTIVE CLOTHING REQUIREMENTS ARE NOT FORMALIZED OR ENFORCED, CONTROLLED AREAS ARE NOT DISTINCT, CONTAMINATED MATERIALS (SOME OF WHICH WAS MEASURED AS HIGH AS 700 MILLIREM PER HOUR AT CONTACT) ARE NOT IDENTIFIED, HIGH RADIATION AREAS, ARE NOT IDENTIFIED, STORAGE CLOSETS CONTAINING HIGH RADIOACTIVE AND CONTAMINATED TOOLS AND EQUIPMENT ARE NOT IDENTIFIED.
6. HIGHLY RADIOACTIVE WASTE MATERIALS ARE COMPACTED IN THE OPEN AIR, OUTSIDE OF ANY ENCLOSURE OR CONTAINMENT. TECHNICIANS REPORTED THAT WHEN THE BAGS

BURST UNDER THE RAM, DUST CLOUDS ARE VISIBLE. NOT AIRBORNE MONITORING IS PERFORMED.

7. PROCEDURES ARE NOT ALWAYS BEING FOLLOWED, AND IN SEVERAL CASES THE PROCEDURE IS INCORRECT.

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