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Our ref: HEM-08-45
Date: May 2, 2008

Subject: Report of Concentrations of Radioactive Material Exceeding Limits in an Unrestricted Area (Docket No. 70-36, License No. SNM-33)

Reference: 10 CFR 20.2203, "Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits"

Dear Sir:

As required by 10 CFR 20.2203(a)(3)(ii), this letter submits the Westinghouse Electric Company LLC (Westinghouse) report of an occurrence identified at the Hematite Decommissioning Project involving levels of radioactive material in an unrestricted area that exceeded 10 times the applicable limits of 10 CFR 20, Appendix C. As detailed further in the attached report, this occurrence did not involve any significant occupational dose or exposure of an individual in excess of the limits in 10 CFR 20.1301.

Pursuant to 10 CFR 20.2203(b), the attached report describes the extent of exposure of individuals to radiation and radioactive material, including: (1) estimates of the individual's dose; (2) the levels of radiation and concentrations of radioactive material involved; (3) the cause of the elevated concentrations; and (4) corrective steps taken and planned to ensure against recurrence. The attached report is provided by the required May 5, 2008, report due date.

If you have any questions concerning this letter, please contact me at the number indicated above, or Matt Featherston of my staff at 314-810-3361.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Kurt Hackmann'.

E. Kurt Hackmann
Director, Hematite Decommissioning Project

Attachment

IE 71
FSME

HEM-08-45

May 2, 2008

Page 2 of 2

cc: Regional Administrator, NRC Region III
J. J. Hayes, NRC/FSME/DWMEP/DURLD
B. A. Watson, NRC/FSME/DWMEP/DURLD
G. M. McCann, NRC Region III
J. A. McCully, Westinghouse
A. S. Candris, Westinghouse

REPORT OF CONCENTRATIONS OF RADIOACTIVE MATERIAL
EXCEEDING LIMITS IN AN UNRESTRICTED AREA

This report is submitted pursuant to 10 CFR 20.2203(a)(3)(ii) regarding an occurrence of radioactive material concentrations in an unrestricted area in excess of ten times applicable limits. The report addresses an occurrence involving the discovery of two small depleted uranium pellets in Hematite Building 230, an unrestricted area of the Hematite site. The activity levels exceeded 10 times the applicable limits of 10 CFR 20, Appendix C, requiring posting and labeling pursuant to 10 CFR 20.1902 and 10 CFR 20.1904. The pellets are installed in two Eberline, Model DA-1, gamma detectors and used to provide an indication of continuous operability. This condition was discovered on April 4, 2008 as a result of a planned work effort to remove the criticality monitors from the Hematite site process buildings as part of the decommissioning effort.

The reporting requirements of 10 CFR 20.2203(a)(3)(ii) were met in that concentrations of radioactive material in unrestricted areas were in excess of 10 times the applicable limit set forth in 10 CFR 20, Appendix C, for posting and labeling as required by 10 CFR 20 Subpart J. Therefore, Westinghouse provides the required written report meeting the content requirements of 10 CFR 20.2203(b), which states:

Contents of reports. (1) Each report required by paragraph (a) of this section must describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

(i) Estimates of each individual's dose; and

(ii) The levels of radiation and concentrations of radioactive material involved; and

(iii) The cause of the elevated exposures, dose rates, or concentrations; and

(iv) Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, ALARA constraints, generally applicable environmental standards, and associated license conditions.

1. 10 CFR 20.2203(b)(1)(i) – Estimates of Each Individual's Dose

External Dose

There is no reasonable likelihood that employees or visitors in the area of the monitors would have received an accumulated radiation dose greater than the limits of 10 CFR 20.1301, "Dose limits for individual members of the public." A radiation survey, performed upon discovery of the incident, indicated a reading of approximately 0.04 mrem/hr on contact with the outside of the criticality monitor. At a distance of 1 foot the radiation dose rate reading

was only approximately 0.005 mrem/hr, which is equivalent to the general area dose rate. Further details of the survey results are provided in Appendix A to this report.

Based on the location and configuration of the installed monitors, no opportunity existed for significant contact dose, and exposures to individuals would have been primarily as a result of the general area field. Both criticality monitors are installed on the outboard side of a 10-inch x 16-inch I-beam stanchion that supports the personnel walkway and the roof of the building. Since the monitors are located at shoulder height and outside the guard rail for the walkway, it is unlikely that employees or visitors would have come into contact with the monitors.

However, based on the survey results summarized above, in a hypothetical scenario involving an individual in contact with the detector for 2000 hours per year, the individual would receive only approximately 80 mrem, which is less than the limits of 10 CFR 20.1301. An individual standing on the walkway in the general area field for 2000 hours per year would receive only 10 mrem, or one-tenth of the 10 CFR 20.1301 yearly limit. This is extremely conservative since the area is a walkway and individuals do not typically loiter in this area. However, even if on occasion individuals stopped to talk in this area the time involved would be of necessity far less than 2000 hours per year.

Internal Dose

There is no reasonable likelihood that an individual could have received an internal dose from these sources. The depleted uranium pellet is mounted inside of the criticality monitor adjacent to the detector. As such, the depleted uranium pellet is fully contained within a metal container that is closed by snap closures.

However, even if they were not contained, it is unlikely that any significant internal dose would have resulted. Specifically, smears were taken on the pellet and surrounding areas and the removable alpha and beta readings were less than the minimum detectable activity (MDA) of 22.07 dpm and 15.72 dpm, respectively. The details of the survey results are provided in Appendix A to this report.

Personnel Involved

Due to the unrestricted area where these items are installed, Westinghouse has been unable to identify specific personnel who may have been exposed to these sources. However, due to the installation location and configuration as described above, no opportunity existed for significant contact dose, and exposures to individuals would have been primarily as a result of the general area field.

2. 10 CFR 20.2203(b)(1)(ii) – Levels of Radiation and Radioactive Material Concentrations Involved

As discussed above, an area survey was performed on the criticality monitors on April 4, 2008. The contact reading on each monitor was approximately 0.04 mrem/hr. The

general area dose rate was measured at approximately 0.005 mrem/hr. The details of the survey results are provided in Appendix A to this report.

There are two radioactive sources, each installed in a criticality monitor. Each radioactive source is a depleted uranium pellet in a solid oxide form, with a total mass of approximately 5.5 grams. The total uranium mass of the source is approximately 4.85 grams. The Uranium-234 (U-234) activity in the source is approximately 1.118 microcuries, which is a quantity greater than ten (10) times the 10 CFR 20, Appendix C, limit for U-234 of 0.001 microcuries. The Uranium-235 (U-235) activity in the source is approximately 0.037 microcuries, which is a quantity greater than ten (10) times the 10 CFR 20, Appendix C, limit for U-235 of 0.001 microcuries.

3. 10 CFR 20.2203(b)(1)(iii) – Cause of the Elevated Exposures, Dose Rates, or Concentrations

It appears that a significant cause of the condition identified herein was inadequate control and tracking of the subject radioactive material sources. From the available evidence, it appears that these sources may not have been formally controlled and tracked since their installation in 1993. Additional details of cause(s) and contributing factors associated with this issue will be documented in the causal analysis that Westinghouse is performing as part of its Corrective Actions Process (CAPs).

4. 10 CFR 20.2203(b)(1)(iv) – Corrective Steps Taken or Planned to Ensure Against a Recurrence

Remedial Action – Posting and Labeling

The area of the installed criticality monitors was surveyed and posted, and the monitors containing the radioactive sources were properly labeled. This was accomplished on April 4, 2008. In addition, a records check was initiated to determine if other equipment might possibly contain untracked radioactive material. Although the records check is ongoing, to date, there is no evidence that a condition similar to that discovered on April 4, 2008, and is the subject of this report, exists at the Hematite site.

Corrective Action to Ensure Against Recurrence

Corrective action taken to prevent recurrence includes incorporating the subject depleted uranium sources in the formal control and tracking system for radiological sources. During and following completion of the CAPs causal analysis to be performed for this issue, any other corrective actions determined to be warranted would be promptly implemented.

