

From: Eric Reber
To: Leslie Fields
Date: Thu, Oct 18, 2001 10:57 AM
Subject: Cabot-Boyertown Violations/Issues Docket No. 04006940

Leslie,

As we discussed today, Region I plans to issue an NOV as a result of the inspection at Cabot-Boyertown that concluded on September 24, 2001, with the following violations:

A. 10 CFR 20.1703 (c)(2) requires that licensees who assign or permit the use of respiratory protection equipment to limit the intake of radioactive material shall implement and maintain a respiratory protection program that includes surveys and bioassays, as necessary, to evaluate actual intakes of radioactive material.

Contrary to the above, as of August 15, 2001, the licensee assigned the use of respiratory protection equipment to limit the intake of radioactive material and did not implement and maintain a respiratory protection program that included surveys and bioassays, as necessary, to evaluate actual intakes. Specifically, the licensee performs annual whole body counts of individuals exposed to airborne radioactive materials. However, because of the minimum detectable activity of these counts and the behavior of Th-232 when it is deposited in the body, these counts are not adequate to detect a hypothetical intake of Th-232 if the intake occurred greater than several days before the whole body count.

This is a Severity Level IV violation (Supplement IV).

B. 10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. Pursuant to 10 CFR 20.1003, survey means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation.

Contrary to the above, since at least 1999, the licensee did not make adequate surveys to assure compliance with 10 CFR 20.1201(a)(1)(ii), which limits the annual occupational dose to individual adults to the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye to 50 rems (0.5 Sv).

Specifically, the licensee failed to adequately assess airborne concentrations of natural uranium and thorium to which workers were exposed in Building 73. Lapel air samplers were not used to estimate the airborne radioactive material concentration in the breathing zones of workers that performed duties in Building 73. The licensee used airborne concentration levels measured at a single general area air sampler located on the first floor of Building 73 to calculate the concentrations of airborne radioactivity that workers were exposed to throughout the building. The air sampler is located between two stations where barrels of ore are dumped. The distance from these two areas of elevated airborne radioactivity concentration to the air sampler is approximately 20 feet. Therefore, this air sample was not being drawn in the breathing zones of the individuals who dumped barrels of ore at these stations. Further, the cleaning of Building 73 and the opening of process lines are two examples of activities that are performed periodically throughout the building that may subject workers to elevated airborne

radioactivity concentrations that would not be adequately measured by the area air sampler on the first floor.

This is a Severity Level IV violation (Supplement IV).

C. Condition 10 of License No. SMB-920 requires that the receipt, possession, and processing of licensed material at the Boyertown facility will be in accordance with the statements, representations, and conditions specified in part, in the letter dated April 10, 1996.

The Appendix to the Air Sampling Program that was submitted with the letter dated April 10, 1996, indicates that a self-absorption factor, F of 0.85 will be used when analyzing air samples.

Contrary to the above, from at least 1999 to August 15, 2001, the licensee did not use a self-absorption factor, F of 0.85 when analyzing air samples. Specifically, the licensee did not incorporate the self-absorption factor into their analysis of air samples from Building 73, so these samples underestimated the amount of airborne radioactivity by 15%. Also, the licensee misapplied this factor to air samples from their background air sampler at Walker Road (i.e., upwind from the facility) and to air samples drawn at the Boiler House and County Line Road which are located at the site boundary. In these cases, the licensee used a factor of 1.15 and airborne radioactivity concentrations were underestimated by 26%.

This is a Severity Level IV violation (Supplement VI).

We also discussed the following issues that should be considered when the Cabot license is renewed:

1. Building 73 has an air handling system that pulls air that potentially contains airborne source material to either a Baghouse in which the dust is collected on bags or a Torrit that uses screw-in filters. Air from the baghouse and the Torrit is exhausted up stacks that are not monitored. The licensee relies on air monitoring at the site boundary to determine its unrestricted area air effluents. The benefit of monitoring air effluents specifically from Building 73 was discussed with the RSO and should be reviewed during the next license renewal.
2. As stated in the licensee's letter dated April 10, 1996, the use of a self-absorption factor of 0.85 for alpha counting was based "... on discussions with engineers and radiation protection personnel in the nuclear power industry ..." Generally, the amount of particulate matter present in ambient air in power plants will be significantly less, and of a differently quality than at the Cabot facility. As discussed with the RSO during the inspection, the self-absorption of alpha particles in air samples can vary widely with the material sampled and the type of filter paper used. Therefore, the self-absorption of alpha particles in air samples with Cabot-specific material should be determined. The licensee should also consider developing a method for correcting alpha self-absorption with increasing density of material collected on the filter sample. This issue should be re-visited when the Cabot license is renewed.
3. The groundwater monitoring wells which are designed to measure potential groundwater contamination from the Mausoleum are in very close proximity to the potential source of contamination - i.e., 10 to 20 feet from the buildings. Therefore, the wells may not be able to

adequately assess whether groundwater contamination is coming from the mausoleums because radioactive material potentially entering the groundwater from the Mausoleum may not have had sufficient horizontal distance to migrate to the sampling point (i.e., 360 feet below grade) because the wells are so close to the buildings.

CC: Elizabeth Ullrich, Frank Costello, John Kinneman...