

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 070-00784 and 040-07044]

Notice of Determination That No Further Action Is Required Under the U.S. Nuclear Regulatory Commission's Authority at the Union Carbide Corporation Facility in Lawrenceburg, TN

AGENCY: U.S. Nuclear Regulatory Commission (NRC).

ACTION: Notice of Determination that no further remedial action is required.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

I. Introduction

The NRC is providing notice that it has determined that no further remedial action under the NRC's authority is required at the Union Carbide Corporation (UCAR) site located at Highway 43 South, in Lawrenceburg, Tennessee (the Site).

UCAR was issued Special Nuclear Materials License No. SNM-724 (SNM-724), on August 26, 1963, for testing equipment and nuclear fuels development. UCAR also held License No. SMB-720 (SMB-720), which authorized the possession of source material at the Site. SNM-724 was terminated on June 4, 1974, and the U.S. Atomic Energy Commission (AEC) released the site for unrestricted use. SMB-720 was superseded by the State of Tennessee License No. S-5002-H8 and was terminated on August 28, 1975.

SNM-724 authorized possession of up to 500 grams (g) of fully-enriched (<94 percent) uranium for testing of equipment and processes in the Lawrenceburg Fuel Development Facility located at the Site. On May 22, 1964, the license was amended to authorize possession of 150 kilograms (kg) of U-235 to make graphite-coated uranium-thorium carbide particles and graphite-matrix fuel elements. The possession limit was increased to 475 kg on June 12, 1964.

By letter dated February 4, 1974, UCAR submitted "closeout" survey information and requested that SNM-724 be terminated and the facility be released for unrestricted use. On April 5, 1974, AEC staff performed a closeout inspection which was documented in

Inspection Report 70-784/74-1. The staff recommended that the license be terminated, and the facility be released for unrestricted use. By AEC letter dated June 4, 1974, SNM-724 was terminated and the UCAR facility released for unrestricted use.

In 1991, the Oak Ridge National Laboratory was contracted by NRC to review and evaluate all nuclear materials licenses terminated by NRC or its predecessor agencies, since inception of materials regulation in the late 1940s. One of the objectives of this review was to identify sites with the potential for residual contamination, based on information in the license documentation. NRC evaluated the available survey data to determine if the information was sufficient to conclude that the site meets the existing guidelines for unrestricted use.

Radiological assessments performed at the UCAR facility and its immediate vicinity identified the presence of enriched and depleted uranium on building surfaces and in soil in excess of applicable radiological release criteria. Sampling identified contamination in three buildings on the UCAR site: Building 10, Building 5 Annex, and the Metallurgy Laboratory. Surface contamination in Building 10, Building 5 Annex, and in the Metallurgy Laboratory was primarily present as fixed contamination. Contamination in soils/sediments in small areas was also present.

Surface contamination above the release guidelines was identified in 11 rooms in Building 10 (Rooms 106-2, 120, 121, 122, 124, 126, 128-1, 129, 132, 133, and 134) ranging from background to 106,469 disintegrations per minute/100 square centimeter (dpm/100 cm²) direct beta/gamma. Volumetric contamination in other areas of the site was found to be above the release criteria: (1) Soil surrounding the incinerator pad; (2) sediment in the manholes and cooling water tanks; (3) laundry sump tank; and (4) the surface layer of concrete flooring. A core sample was taken near the incinerator pad. The range for total uranium concentration was 1.33 to 3,655 picocuries per gram (pCi/g). The estimated average depth of the soil contamination was one foot resulting in a contaminated soil volume estimate of 500 cubic feet.

Uranium was also the primary contaminant in Building 5 Annex. Surface contamination was found in four rooms in Building 5 (Rooms 106, 107, 108, 110), ranging from background to 428,698 dpm/100 cm² direct beta/gamma. Volumetric contamination above the release criteria was found in three areas in and around Building 5: (1)

Sink trap; (2) concrete flooring; and (3) asphalt outside exit.

Contamination in the Metallurgy Laboratory consisted of localized surface contamination on the tops of cabinets. There was no indication of radioactive material above the release criteria beyond the former restricted area boundary in the ground water, settling basins, or former sanitary sewer system.

UCAR voluntarily conducted remediation activities without a license, as its license was terminated in 1974. Although UCAR was not a licensee, NRC staff conducted periodic inspections to ensure that remediation was performed in accordance with current regulations and release limits.

As part of its remediation activities, UCAR amassed fifteen (15) 24-yard³ intermodal containers of solid low-level radiological waste. UCAR reported concentrations in the intermodal containers averaging approximately 25 pCi/g of U-235 and 1,082 pCi/g of total uranium.

On February 15 and 16, 2006, NRC staff conducted an inspection of the UCAR site that included Building 10, Building 5 Annex, the Metallurgy Lab, the incinerator pad and other areas, as well as the intermodal containers (Inspection Report 07000784/2005001). This inspection found that residual uranium contamination on surfaces and soil met the criteria in the remediation plan for unrestricted use. The remediation activities in Building 10 and the incinerator pad resulted in complete removal of the structures and the concrete floor pads so that no surfaces were available for surface contamination measurements. Gamma scans of areas where an incinerator pad, drain lines, and a buried water cooling tank had been located, as well as scans of various non-remediated areas found no areas of elevated gamma exposure rates. Direct alpha measurement of the Building 5 Annex and the Metallurgy Lab were all less than 2000 dpm/100cm². The inspector found no areas of elevated gamma exposure rates in the scanned areas.

Soil samples were taken from Site areas based on operational history and remediation activities and were analyzed by the Oak Ridge Institute for Science and Education for isotopic concentrations of U-234, U-235, and U-238. All samples were surface soil, collected within the top four inches of the soil surface. One sample from the Building 5 Annex showed elevated concentrations of U-234, but when averaged over the survey unit was found to be within the derived concentration guidelines for soils at the site.

The NRC inspector examined the intermodal containers while they were stored at the site. The amount of U-235 in the intermodals ranged from 75 to 206 grams per intermodal. One of the intermodals contained a sump from Building 10 and had a contact exposure rate of 65 microroentgens/hour. Measurements of the other containers were not significantly above background. On August 14, 2006, UCAR provided copies of the shipping manifests demonstrating that the 15 intermodal containers had been accepted for disposal by EnergySolutions in Utah.

UCAR provided a final radiological status survey and the NRC staff performed an independent dose assessment to demonstrate the site meets the license termination criteria in Subpart E of 10 CFR Part 20. Based on its reviews of UCAR submittals and its own analyses and assessments, the NRC staff has determined that the site meets the unrestricted release dose criteria in 10 CFR Part 20.1402 and that no further remedial action under the NRC's authority is required at the UCAR site. The staff prepared a Safety Evaluation Report (SER) (ML062580415) to support its determination.

II. Further Information

In accordance with 10 CFR Part 2.790 of the NRC's "Rules of Practice," details with respect to this action, including the SER, are available electronically at the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this site, you can access the NRC's Agency wide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. The ADAMS accession number for the termination letter and SER, "Safety Evaluation Report to Support the Determination that No Further Action is Required under the Authority of the U.S. Nuclear Regulatory Commission at the Union Carbide Corporation Facility in Lawrenceburg, TN" (Docket Nos. 070-00784 and 040-07044) is ADAMS No. ML062620512. If you do not have access to ADAMS or if there are problems in accessing a document located in ADAMS, contact the NRC Public Document Room Reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to: pdr@nrc.gov.

This document may also be viewed electronically on the public computers located at the NRC's PDR, O-1-F21, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852. The PDR reproduction contractor will copy documents for a fee.

Dated at NRC, Rockville, MD, this 22nd day of September, 2006.

For the Nuclear Regulatory Commission.

Keith I. McConnell,

Deputy Director, Decommissioning Directorate, Division of Waste Management and Environmental Protection, Office of Nuclear Material Safety and Safeguards.

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. STN 50-454, STN 50-455, STN 50-456 and STN 50-457]

Exelon Generation Company, LLC, Byron Station, Unit Nos. 1 and 2; Braidwood Station, Unit Nos. 1 and 2; Environmental Assessment and Finding of No Significant Impact

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an exemption from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.60(a), for Facility Operating License Nos. NPF-37, NPF-66, NPF-72 and NPF-77, issued to Exelon Generation Company, LLC (the licensee), for operation of the Byron Station, Unit Nos. 1 and 2 (Byron), and Braidwood Station, Unit Nos. 1 and 2 (Braidwood), located in Ogle County, Illinois and Will County, Illinois, respectively. Therefore, as required by 10 CFR 51.21, the NRC is issuing this environmental assessment and finding of no significant impact.

Environmental Assessment

Identification of the Proposed Action

The proposed action would allow the use of the methods described in Westinghouse Commercial Atomic Power Report (WCAP)-16143, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Byron/Braidwood Units 1 and 2," dated November 2003, in calculating the reactor pressure vessel (RPV) pressure-temperature (P-T) limits for Byron and Braidwood, in lieu of 10 CFR Part 50, Appendix G, "Fracture Toughness Requirements," paragraph IV.A.2.c as required by 10 CFR 50.60(a).

The proposed action is in accordance with the licensee's application for exemption dated October 3, 2005.

The Need for the Proposed Action

The proposed action is needed because utilization of WCAP-16143 will enhance overall plant safety by widening the P-T operating window, especially in the region of low temperature operations. The primary

two safety benefits that would be realized are the following: (1) A reduction in the potential challenges to the low-temperature overpressure protection system and resultant inadvertent opening of a power operated relief valve, and (2) a reduction in the risk of damaging the reactor coolant pump seals due to pump operation under conditions in which it is difficult to maintain adequate seal differential pressure to ensure proper pump operation.

Appendix G to 10 CFR Part 50 contains requirements for P-T limits for the primary system and requirements for metal temperature of the closure head flange and vessel flange regions. The P-T limits are to be determined using the methodology of American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, Appendix G, but the flange temperature requirements are specified in 10 CFR Part 50, Appendix G. This regulation (Table 1 of 10 CFR Part 50, Appendix G) states that the metal temperature at the closure flange regions must exceed the material unirradiated nil-ductility transition reference temperature (RT_{NDT}) by at least 120 °F for normal operation when the pressure exceeds 20 percent of the pre-service hydrostatic test pressure.

This requirement was originally based on concerns about the fracture margin in the closure flange region. During the boltup process, outside surface stresses in this region typically reach over 70 percent of the steady state stress, without being at steady state temperature. The margin of 120 °F and the pressure limitation of 20 percent of hydrostatic pressure were developed in the mid-1970s using the ASME Code lower bound crack arrest/dynamic test fracture toughness (K_{IC}) to ensure that appropriate margins would be maintained.

Improved knowledge of fracture toughness and other issues that affect the integrity of the reactor vessel have led to the recent change to allow the use of the ASME Code lower bound static crack initiation fracture toughness (K_{IC}) in the development of P-T curves, as contained in ASME Code Case N-640, "Alternative Reference Fracture Toughness for Development of P-T Limit Curves for Section XI, Division 1." ASME Code Case N-640 has been approved for use without conditions by the NRC staff in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," published in August 2005.

However, P-T limit curves can still produce operational constraints by limiting the operational range available