

June 6, 1996

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MEMORANDUM TO: John Stolz, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

FROM: Thomas H. Essig, Chief Original signed by:
Emergency Preparedness and
Environmental Health Physics Section
Emergency Preparedness and
Radiation Protection Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2, ONSITE DISPOSAL
OF CONTAMINATED MATERIAL PURSUANT TO 10 CFR 20.2002

The Emergency Preparedness and Radiation Protection Branch has completed its review of the PECO Energy Company's (the licensee) application, dated April 6, 1995, as supplemented on November 15, 1995, for approval, pursuant to 10 CFR 20.2002, to dispose of contaminated soil, sediment, and sludges on the Limerick Generating Station site.

Attachment 1 to this memorandum provides our evaluation of the licensee's application. Attachment 2 provides a SALP input.

We find the licensee's application to be acceptable, with the added requirement that the licensee incorporate the analysis used to support this application into its Radiological Process Control Program. Any changes made, by the licensee, to the analysis of this approved application must be submitted to the NRC for approval prior to implementation. This is to ensure that all disposals conducted under this approved application remain within the analyzed bounding conditions.

This completes our review under TAC Nos. M92295 and M92296.

Docket Nos. 50-352
50-353

Attachments: 1. Safety Evaluation
2. SALP Input

CONTACT: Stephen Klementowicz, NRR/PERB
415-1084

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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EVALUATION BY THE EMERGENCY PREPAREDNESS

AND RADIATION PROTECTION BRANCH

OFFICE OF NUCLEAR REACTOR REGULATION

PECO ENERGY COMPANY

LIMERICK GENERATING STATION UNITS 1 AND 2

ONSITE DISPOSAL OF CONTAMINATED MATERIAL PURSUANT TO 10 CFR 20.2002

DOCKET NOS. 50-352 AND 50-353

Introduction

By letter dated April 6, 1995, and as supplemented on November 15, 1995, PECO Energy Company (the licensee), requested approval pursuant to 10 CFR 20.2002 for the disposal of contaminated material in a manner not specifically described in 10 CFR Part 20, Subpart K. The licensee has proposed to dispose of a maximum of 70,000 cubic feet of contaminated material (i.e., soil, sediment, and sludges) per year from the Limerick Generating Station (LGS) site settling basin, emergency spray pond, and cooling tower basins to a specific area within the LGS site restricted area. The licensee has anticipated the need for future disposals of this type of material and has performed an evaluation to support the disposal of a maximum of 1,120,000 cubic feet over a 16 year period.

The licensee's request contains: (1) A detailed description of the licensed material to be disposed, including the physical and chemical properties important to risk evaluation, and the proposed manner and conditions of waste disposal; (2) An analysis and evaluation of pertinent information on the nature of the environment; (3) The nature and location of potentially affected facilities; and (4) Analyses and procedures to ensure that doses are maintained ALARA.

Description of waste

The material to be disposed of is composed of soil, sediment, and sludges (i.e., flowable solids). The material originates from the LGS settling basin, emergency spray pond, and cooling tower basins. The materials are suspended solids which have settled to the bottom of these systems.

In order to assess the magnitude of the disposal, the material from the settling basin was sampled and analyzed using a lower limit of detection (LLD) consistent with the LLDs used in the licensee's radiological environmental monitoring program (REMP). In addition to the naturally occurring

radionuclides (i.e., Be-7, K-40, Ra-226, and Th-228), statistically positive activities for Mn-54, Co-60, and Cs-137 were also detected. The activity for Mn-54 averaged $1.8 \text{ E-}08 \text{ } \mu\text{Ci/gram (dry)}$, and ranged from $5.0 \text{ E-}09$ to $4.0 \text{ E-}08 \text{ } \mu\text{Ci/gram (dry)}$. The activity for Co-60 averaged $1.14 \text{ E-}07 \text{ } \mu\text{Ci/gram (dry)}$, and ranged from $4.0 \text{ E-}08$ to $2.2 \text{ E-}08 \text{ } \mu\text{Ci/gram (dry)}$. The activity for Cs-137 averaged $3.7 \text{ E-}08 \text{ } \mu\text{Ci/gram (dry)}$, and ranged from $3.8 \text{ E-}09$ to $6.0 \text{ E-}08 \text{ } \mu\text{Ci/gram (dry)}$. The Cs-137 activity was consistent with background levels observed in the Limerick area as a result of fallout from atomic weapons testing.

To evaluate the radiological dose consequences of the multiple disposals, the licensee performed a conservative bounding analysis using radionuclide concentrations equal to 10 times the values of the LLD for monitoring effluents, as defined in the LGS Radiological Process Control Program. The concentrations used in the bounding calculation are higher than the actual concentrations observed in the settling basin discussed above.

Disposal method and location

The material will be transported to the designated on-site area, near the on-site radwaste storage pad, west-northwest of the emergency spray pond. The material will be placed in the 1.5 acre area, graded, and seeded with grass to prevent wind erosion and to blend in with the surrounding area.

While in this designated restricted area, the contaminated material is expected to decay to non-detectable levels by the time the plant is expected to be decommissioned.

The designated disposal area is part of the site restricted area and will be patrolled and monitored by LGS plant security personnel.

Evaluation

In its application, the licensee used the computer code GASPAR to calculate doses to the general public, non-occupationally exposed workers, and to the inadvertent intruder.

~~The licensee has committed to the following: the calculated exposure to the maximally exposed member of the public will not exceed $1.82 \text{ E-}4 \text{ mrem per year}$, total effective dose equivalent; $0.101 \text{ mrem per year}$ to the critical organ (infant's liver, via the goat milk pathway); the calculated maximum exposure to a plant worker will not exceed $3.1 \text{ mrem per year}$; and the calculated dose to an inadvertent intruder will not exceed $0.75 \text{ mrem per year}$. The calculated doses are well within the limits of 10 CFR Part 20 and 40 CFR Part 190. Actual doses are expected to be less than the calculated doses.~~

The licensee has committed to establish a program to provide for periodic verification of expected radionuclide concentrations, activity levels, and radionuclide distribution. The licensee will perform an analysis for every future quantity of material removed from the specified locations prior to placing the material in the designated disposal area. The performance of this method and analysis will be controlled by the LGS Radiological Process Control

Program. Further, the licensee has a program to provide for maintenance of appropriate records of radionuclide concentrations and total activity. The licensee has stated that these records will be maintained in accordance with 10 CFR 50.75(g).

The licensee has committed to revise the LGS Updated Final Safety Analysis Report to include a description of the designated disposal area, and the bounding analysis used for this application.

The licensee's radiological environmental monitoring program (REMP) will be used to monitor any offsite release of radioactive material from the disposed material. The results of the REMF analyses will be reviewed by the licensee to confirm that the material is within the bounds of its original analysis.

The licensee has acknowledged that the material is also subject to the requirements of the Pennsylvania Department of Environmental Resources residual waste requirements.

The staff has reviewed the proposed disposal site layout and topography and has verified that the general topography of the disposal site is compatible with the proposed disposal mechanisms and that it is unlikely that the disposed material would be recycled.

Conclusion

The staff has reviewed the licensee's application and has concluded that the doses calculated by the licensee appear reasonable, are a small percentage of 10 CFR Part 20 public dose limits, and conforms to the requirements set forth in 10 CFR 20.2002 and is therefore acceptable.

The staff requires the licensee to incorporate the analysis used to support this application into its Radiological Process Control Program. Any changes, by the licensee, to the analysis of this approved application must be submitted to the NRC for approval prior to implementation. This is to ensure that all disposals conducted under this approved application remain within the analyzed bounding conditions.

SALP INPUT

Facility Name: LIMERICK GENERATING STATION, UNITS 1 AND 2

Subject: REVIEW OF ONSITE DISPOSAL OF CONTAMINATED MATERIAL PURSUANT TO 10
CFR 20.2002

Review Area: By letter dated April 6, 1995, and as supplemented on
November 15, 1995, PECO Energy Company (the licensee), submitted an
application, pursuant to 10 CFR 20.2002 for the on-site disposal of
contaminated material (i.e., soil, sediment, and sludges).

Licensee's Performance - Engineering/Technical Support

The licensee's submittal was well written and contained above average
technical background and related information to support its request. When
requested, the licensee provided additional information to clarify its
original application.

The overall quality of the licensee's TS package was good.

Principal Contributor: Stephen Klementowicz

Date: May 30, 1996
