

Pacific Gas and Electric Company
Humboldt Bay Power Plant
Paul J. Roller
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PG&E Letter HBL-10-018



U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-133, License No. DPR-7
Humboldt Bay Power Plant Unit 3
Revision to Request for 10 CFR 20.2002 Alternate Disposal Approval and 10 CFR 30.11
Exemption of Humboldt Bay Power Plant Waste for Disposal at US Ecology Idaho

Dear Commissioners and Staff:

On April 1, 2010, Pacific Gas and Electric Company (PG&E) submitted letter HBL-10-003 requesting NRC approval for alternate disposal of approximately 200,000 cubic feet of hazardous waste containing low-activity radioactive debris, at the US Ecology Idaho (USEI) Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous disposal facility located near Grand View, Idaho. This request was made under the alternate disposal provision contained in 10 CFR 20.2002 and the exemption provision in 10 CFR 30.11. The material will be generated during demolition of structures at the Humboldt Bay Power Plant (HBPP) site, including Unit 3 and non-nuclear Units 1 and 2.

As a result of the NRC review of the PG&E request, the NRC submitted nine questions via email from John Hickman (NRC) to David Sokolsky (PG&E) on July 16, 2010. PG&E personnel met with the NRC in a public meeting on July 29, 2010 to respond to the NRC questions. As a result of the meeting discussions, PG&E revised Enclosure 1 to HBL-10-003 to include the following changes: (1) the sentence on "running average" was removed from Section 3, revised for clarification and more appropriately inserted in Section 4.2, and (2) incorrect values in Table 2 were changed to reflect accurate conditions. These changes are noted with revision bars in the Enclosure to this letter (HBL-10-018). The Enclosure to this letter replaces Enclosure 1 to HBL-10-003 in its entirety and is being submitted for NRC review. Enclosure 1, Attachment 1, to HBL-10-003 is not affected by this change.

As stated in HBL-10-003, PG&E intends to terminate operation of HBPP Units 1 and 2 in September 2010 and begin demolition shortly thereafter. Therefore, PG&E would appreciate your written response to the original request for authorization of alternate disposal by September 2010.

N. M. SSOI
FSME

If you wish to discuss the information in the enclosure, please contact David Sokolsky at (707) 444-0801.

Sincerely,



Paul J. Roller
Director and Plant Manager Humboldt Bay Nuclear

cc/enc: Elmo E. Collins, Jr., US NRC Region IV
John B. Hickman, US NRC
Chad Hyslop, US Ecology Idaho
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PG Fossil Gen HBPP Humboldt Distribution

Enclosure

HUMBOLDT BAY POWER PLANT

EVALUATION IN SUPPORT OF ALTERNATE WASTE DISPOSAL

PROCEDURES IN ACCORDANCE WITH 10 CFR 20.2002

1. INTRODUCTION

Pacific Gas and Electric Company (PG&E) requests NRC authorization for disposal of hazardous waste, soils and debris containing low-activity radioactive materials in accordance with the provisions of 10 CFR 20.2002 and issuance of a specific exemption under 10 CFR 30.11. Since the subject material does not contain Special Nuclear Material, a 10 CFR 70.17 exemption is not required or requested. NRC approval of proposed disposal procedures, in accordance with 10 CFR 20.2002, will allow Humboldt Bay Power Plant (HBPP) to dispose of the waste described in Section 3 of this enclosure at the US Ecology Idaho (USEI) disposal facility. The USEI disposal facility is a Subtitle C Resource Conservation and Recovery Act (RCRA) hazardous waste disposal facility permitted by the State of Idaho and located near Grand View, Idaho.

Section 2 of this enclosure references Attachment 1 which describes the disposal site characteristics. A description of the material to be disposed is included in Section 3. The material description includes physical and chemical properties of the material important to risk evaluation and the proposed conditions of waste disposal. Section 4 provides radiological assessments, including potential transport dose to the public as well as USEI worker dose. A conclusion is provided in Section 5 that confirms doses will be well below NRC limits.

Attachment 1 to this enclosure contains a description of the USEI facility. Attachment 2 provides Microshield models and results pertaining to potential external and internal radiological dose hazards to the USEI workers and transportation workers. Attachment 3 contains the RESRAD modeling report used to calculate maximum dose projections. Attachment 4 contains an intruder scenario consistent with the NRC's Request for Additional Information on the Westinghouse Hematite project (Docket #07000036)

2. DISPOSAL SITE CHARACTERISTICS

A description of the USEI facility near Grand View, Idaho is provided in Attachment 1. USEI has refined the RESRAD model's parameters to reflect site-specific characteristics in place of certain default values.

3. DESCRIPTION OF THE WASTE

The waste consists of approximately 200,000 cubic feet of concrete, steel, insulation, roofing material, gravel and other metal, wood and soil debris from demolition of oil-fired Units 1 and 2 not associated with Unit 3 reactor operations. In addition, this request includes some material from Unit 3, primarily concrete shielding, building materials, and soil debris. Overall, these wastes exhibit an average bulk density of 55 pounds per cubic foot. The waste is classified primarily as RCRA hazardous for lead in accordance with Environmental Protection Agency (EPA) Code D008. The USEI facility is permitted to accept D008 waste, which is managed at the site by encapsulation treatment as required to meet EPA Land Disposal Restriction (LDR) requirements. Some asbestos containing material (ACM) is also included.

Portions of the waste are also contaminated with radionuclide concentrations equal to or less than the concentrations listed in Table 1 below. Based on the nature of the materials, a 10 CFR Part 30.11 exemption applies and a Part 70.17 exemption is not required.

TABLE 1- RADIONUCLIDES POTENTIALLY PRESENT
(ALL CONCENTRATIONS ARE IN pCi/g)

Nuclide	pCi/gm
Cs-137	15
Co-60	5
Sr-90	1
H-3	100
C-14	1
Fe-55	1
Ni-63	10
Eu-152	1
Eu-154	1
Ag-108M	0.1

All shipments will be bounded by the maximum activity allowed in the site waste acceptance criteria (WAC) set forth in USEI's permit issued by the Idaho Department of Environmental Quality (provided in Enclosure 2).

These concentrations are below levels requiring the waste to be classified as radioactive material for shipment purposes under U.S. Department of Transportation (DOT) regulations.

4. RADIOLOGICAL ASSESSMENT

In the following conservatively developed exposure scenarios, the dose equivalent for the Maximally Exposed Individual (MEI) has been

demonstrated not to exceed a few millirem per year. This standard of a "few millirem" per year to a member of the public is set forth in NRC Regulatory Issue Summary 2004-08, "Results of the License Termination Rule Analysis," dated May 28, 2004. The transportation workers and workers at the USEI site are treated as members of the public because the USEI site, while permitted under RCRA to accept certain radioactive materials, is not licensed under the Atomic Energy Act. Evaluations of both potential external and internal dose hazards to USEI workers and transportation workers are discussed below (see Microshield models in Attachment 2).

4.1. Transport Dose to Public

The materials will be transported by truck to the USEI facility. For normal highway transport conditions, the material will be enclosed in a strong-tight container verified to be in compliance with DOT external loose surface contamination limits prior to shipment. Therefore, transport will pose no potential for internal dose to the driver or other members of the public. Because of the very low average concentrations of radionuclides, potential external dose to members of the public, individually and as a whole, is conservatively calculated to be very low. External dose, as has been demonstrated in the worker dose assessment below, will be very low. As a result, the dose to other members of the general public can be reasonably concluded to be much less.

4.2. USEI Worker Dose Assessment

The distance from HBPP Unit 3 to the USEI disposal facility is approximately 659 miles. Assuming an average speed of 50 miles per hour, the trip is estimated to take 13.18 hours. At least 7 trucks will be used to transport the waste over the course of the project and for maximum logistical efficiency. Using 7 trucks, hauling the 300 intermodal containers, each truck driver will make 43 round trips. Calculated doses to truck drivers are provided in Table 2.

Upon receipt at the facility, the material will be surveyed and screened prior to being taken to the indoor stabilization facility on the USEI site. Five minutes is required to perform a survey of each truck. Based on current practice, the surveyor is assumed to stand with his body one meter from the truck or trailer during the survey with four surveyors sharing the surveying task. Calculated doses to surveyors are provided in Table 2.

The waste will then be delivered to the stabilization building for treatment of the D008 RCRA lead constituents. It is conservatively assumed that all waste from HBPP will require treatment, when in fact a portion of the waste will not, as determined by HBPP through its waste analysis and

characterization program. The waste will be placed into a steel-lined concrete tank where it will be mixed with stabilization reagents. Wastes are wetted as they are emptied into the stabilization tanks to reduce dusting. The building is also equipped with a negative pressure air handling system so that air only moves into the building and is exhausted through HEPA filters. The stabilization process requires approximately 45 minutes, during which time the excavator operator is approximately 2.8 meters from the waste wearing a respirator within an enclosed cab. Four operators share the stabilization task. Calculated doses to stabilization operators are provided in Table 2.

After stabilization, the excavator operator removes the treated waste from the stabilization tank and places it into an on-site haul truck for transport to the disposal cell for burial. Doses to haul truck operators will be much less than to the truck drivers transporting the waste from HBPP since exposure times are much shorter. As a result, doses to haul truck operators are not analyzed

After this delivery to the disposal cell, a bulldozer operator wearing a respirator within an enclosed cab then spreads and compacts the waste.

For the purpose of the dose assessment, dust loading in the stabilization building is used in calculating a bounding case potential dose for all personnel who could possibly receive an inhalation dose. Personnel who work in the stabilization building are the maximally exposed individuals for inhalation dose compared to operations conducted in open air conditions. As noted, all personnel working in the stabilization building and in the disposal cells are required to wear air purifying respirators at all times.

A minimal dose is calculated for the two bulldozer operators who share the task of spreading and compacting the stabilized waste material once it has been deposited within the disposal cell. The average time to spread and compact 60 cubic yards of material (which is the capacity of two intermodal containers) is 15 minutes. This shorter exposure time results in a lesser potential dose from airborne radionuclides than what was calculated for the excavator operator. Calculated doses to disposal cell bulldozer operators are provided in Table 2.

Significantly, all USEI employees who work with any hazardous materials are required to participate in an Occupational Safety and Health Administration (OSHA) compliant respiratory protection program. Although respiratory protection is required for the above specified workers, no credit is taken for this proven form of protection in this conservative dose assessment. In summary, Table 2 presents the resulting, conservatively calculated doses to the transporters and USEI workers from the transport and disposal of the waste from HBPP. A running

average of radionuclide concentrations for all shipments will be kept to ensure that additional driving time due to weather conditions or road closures will not result in doses to drivers that exceed the levels in Table 2.

TABLE 2- DOSES TO DRIVERS AND USEI EMPLOYEES FOR PROJECT

Function	No. Employees	Time (hr)	External Exposure Rate (mR/hr)	Internal Dose Rate (mrem/hr)	Distance (m)	No. Reps	External Dose (mrem)	Internal Dose (mrem)	Total Dose (mrem)
HBPP driver	8	13.18	4.63E-04	0	4.8	300	2.29E-01	0	2.29E-01
Survey	4	0.0833	7.27E-03	0	1	300	4.54E-02	0	4.54E-02
Stab	6	0.75	1.82E-03	9.61E-07	2.78	128	2.91E-02	1.54E-05	2.91E-02
Cell	2	0.25	3.85E-03	9.61E-07	2	128	6.15E-02	1.54E-05	6.15E-02

Copies of the Microshield results for these scenarios are presented in Attachment 2.

4.3. Post Closure Dose to the General Public

USEI's RCRA permit requires that it demonstrate that no person will receive a dose exceeding 15 millirem for 1,000 years after closure of the facility. This standard is more restrictive than the 25 millirem total effective dose equivalent (TEDE) NRC decommissioning limits as well as the limits for near surface disposal of low-level radioactive waste set forth in 10 CFR Part 61. The RESRAD code was used to make that demonstration. A number of default parameters in the model have been replaced with site specific parameters consistent with the facility's 2005 permit modification and a report prepared by its consultant (previously submitted to the NRC as part of an RAI for the Westinghouse exemption request for the Hematite project, Docket #07000036).

As can be seen in the RESRAD report (Attachment 3), the maximum dose calculated by the model for the disposal of the HBPP radionuclides is 4.5E-4 mrem/year at 1,000 years following closure of the facility.

In addition, a conservative intruder scenario was conducted using the method found in NUREG 0782. Calculated doses under this scenario were 0.134 mrem, well below the NRC's alternate disposal guidance. A copy of the intruder spreadsheet is found at Attachment 4.

5. CONCLUSION

PG&E developed this request and related evaluation in consultation with USEI, including health physics personnel responsible for the receiving

disposal facility's radiological performance assessment. This assessment team led by PG&E performed a conservative radiological dose assessment of the material and determined that the potential dose to the workers involved in the transportation and placement of the material and to members of the general public after site closure will be less than one millirem per year TEDE from this project. This dose will be a small fraction of the NRC decommissioning limits for exposure to any member of the public of 25 millirem/yr TEDE, and well within the "few millirem" criteria that the NRC has established in NRC Regulatory Issue Summary (RIS) 2004-08, "Results of the License Termination Rule Analysis," dated May 28, 2004. RIS 2004-08, page 4, states that "10 CFR 20.2002 does not establish a specific standard for approving on-site disposal requests. Staff's current practice is to approve on-site disposal based on a criterion of a "few millirem." This request meets that criterion.