



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 11, 2018

Mr. Edward D. Halpin
Senior Vice President and
Chief Nuclear Officer
Pacific Gas and Electric Company
P.O. Box 56
Mail Code 104/6
Avila Beach, CA 93424

SUBJECT: HUMBOLDT BAY POWER PLANT, UNIT 3 - APPROVAL OF FINAL STATUS
SURVEY REPORTS FOR OOL10-04 AND ISF01-01

Dear Mr. Halpin:

By letters dated July 19, 2018, Pacific Gas and Electric Company (PG&E) submitted final status survey reports (FSSRs) for the Mobile Emergency Power Plant Station Area (Survey Unit OOL10-04) and the Independent Spent Fuel Storage Installation Area (Survey Unit ISF01-01).

The staff has reviewed your FSSRs for OOL10-04 and ISF01-01, and the results presented are all a fraction of the DCGL. The gamma walkover scanning coverage described in the report was adequate and found no elevated locations. PG&E also indicates that no investigation levels for scan or sample measurements were triggered during the surveys. Based on the survey results, survey units OOL10-04 and ISF01-01 are acceptable to support release of those areas for unrestricted use.

Further details on our review are provided in the enclosed safety evaluation including some areas where improvements should be considered for future surveys.

- 2 -

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System . (ADAMS) is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions regarding this action, please contact me at 301-415-3017 or via e-mail at John.Hickman@nrc.gov.

Sincerely,

//RA//

John B. Hickman, Project Manager
Reactor Decommissioning Branch
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 50-133

Enclosure: Safety Evaluation

cc w/Enclosure:
Humboldt Bay Service List

E. Halpin

3

SUBJECT: HUMBOLDT BAY POWER PLANT, UNIT 3 - APPROVAL OF FINAL STATUS SURVEY REPORTS FOR OOL10-04 AND ISF01-01 **DATE October 15, 2018**

Docket No. 50-133

Enclosure: Safety Evaluation

cc w/enclosure:
Humboldt Bay Service List

DISTRIBUTION: DCD r/f OGC ACRS/ACNW JKatanic, RIV

ADAMS ACCESSION NO: ML18278A087

***via email**

OFFICE	DUWP:PM	DUWP:LA	DUWP:BC	DUWP:PM
NAME	JHickman	CHolston	BWatson	JHickman
DATE	10/11/2018	10/11/2018	10/11/2018	10/11/2018

OFFICIAL RECORD COPY

SAFETY EVALUATION BY OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

RELATED TO FINAL STATUS SURVEYS FOR THE MOBILE EMERGENCY POWER PLANT

STATION AREA AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION AREA

FACILITY OPERATING LICENSE NO. DPR-7

PACIFIC GAS AND ELECTRIC COMPANY

HUMBOLDT BAY POWER PLANT UNIT 3

DOCKET NO. 50-133

1.0 INTRODUCTION

NRC staff reviewed Final Status Survey Reports for Survey Units HBPP-FSS-OOL 10-04 (Mobile Emergency Power Plant Station Area) and HBPP-FSS-ISF01-01-00 (Independent Spent Fuel Storage Installation Area), as provided by letters on July 19, 2018 (ADAMS Accession Numbers ML18200A248 and ML18269A133). The licensee's Final Status Survey (FSS) design criteria, implementation of the Data Quality Objectives (DQO) process, and survey approach/methods were reviewed, and final results were assessed against the licensee's approved release criteria.

2.0 EVALUATION

2.1 HBPP-FSS-OOL 10-04 (Mobile Emergency Power Plant Station Area)

The survey unit designated as HBPP-FSS-OOL 10-04 was classified by the licensee as a MARSSIM Class 3 unit, and is described as an open land area northeast of King Salmon Avenue (southwest of the New Generation Footprint) which is "industrialized" and "in general as the footprint of the former Mobile Emergency Power Plant Station (MEPPS)." The survey unit is approximately 2,244 square meters of area, which is consistent with MARSSIM guidance on Class 3 land survey areas (i.e., no size limit).

The licensee's LTP requires 1-10% of Class 3 areas to receive gamma walkover scan coverage during FSS, and the scan survey completed for OOL 10-04 was performed over approximately 25% of the area. This coverage is consistent with MARSSIM recommendations for judgmental scan coverage in Class 3 areas.

The licensee's DQO process determined that Cs-137 is the radionuclide of concern in the survey unit based upon previous characterization data, and no hard-to-detect (HTD) plant derived radionuclides were identified as a result of previous characterization. As such, the Cs-137 soil DCGL (7.93 pCi/g) was used for survey planning purposes. The licensee determined the required number of soil samples using a Type 1 and Type 2 error of 0.05 and a sigma of 0.18 pCi/g, and the LBGR was set to 7.57 pCi/g in order to achieve a relative shift in the range of 1 and 3 (i.e., using a relative shift of 2.0). The required number of samples was 15, and the licensee took 15 randomly selected soil samples, which is consistent with Table 5.5 of MARSSIM. Additionally, 2 judgmental soil samples were collected from a drainage ditch along the south side of an access road within the survey unit. A soil sampling investigation level was established at 50% of the Cs-137 DCGL, or 3.97 pCi/g Cs-137, and a scan investigation was

established for anything detectable above background. These investigation levels are consistent with investigation levels described in Table 5-5 of the licensee's LTP, and they are adequate per Table 5.8 of MARSSIM.

In addition to gamma measurements, the licensee performed analyses for HTD radionuclides on 2 randomly selected samples from the survey unit, which included alpha spectroscopy, gas proportional counting, and liquid scintillation depending on the radionuclide and the measurement method. This frequency of HTD analyses is consistent with guidance from MARSSIM Section 4.3.2.

The licensee's survey results indicated that Cs-137 was not identified in any of the soil samples collected for non-parametric statistical testing, and neither of the 2 HTD samples tested positive for Cs-137 or other plant derived radionuclides. No soil samples triggered an investigation. Since no sample exceeded the DCGL, the statistical test (i.e., Sign Test) was not required. As such, the licensee acknowledged that "the Sign Test was performed (by inspection) on the data and compared to the original assumptions of the DQOs," and that "the evaluation of the Sign Test results demonstrates that the survey unit passes the unrestricted release criteria, thus, the null hypothesis is rejected." NRC staff concludes that the licensee's survey and analyses for this survey unit provide reasonable assurance the licensee is able to demonstrate compliance with the unrestricted release criteria of 10 CFR 20.1402.

2.2 HBPP-FSS-ISF01-01-00 (Independent Spent Fuel Storage Installation)

The survey unit designated as HBPP-FSS-ISF01-01-00 was classified by the licensee as a MARSSIM Class 3 unit, and it is a portion of the survey area consisting of the 10 CFR 72 licensed land area associated with the operation of the Independent Spent Fuel Storage Installation (ISFSI). ISF01-01 does not include the area containing the fuel storage vaults, as they are deemed inaccessible to survey. The ISFSI fuel storage vaults are located within a separate Class 1 survey unit (ISF01-02) that is in the center of ISF01-01. ISF01-01 is approximately 5,541 square meters of area, which is consistent with MARSSIM guidance on Class 3 land survey areas (i.e., no size limit).

The licensee's LTP requires 1-10% of Class 3 areas to receive gamma walkover scan coverage during FSS, and the scan survey completed for ISF01-01 was performed over approximately 50% of the area. This coverage is consistent with MARSSIM recommendations for judgmental scan coverage in Class 3 areas.

The licensee's DQO process determined that Cs-137 is the radionuclide of concern in the survey unit based upon previous characterization data. As such, the Cs-137 soil DCGL (7.93 pCi/g) was used for survey planning purposes. The licensee determined the required number of soil samples using a Type 1 and Type 2 error of 0.05 and a sigma of 0.18 pCi/g, and the LBGR was set to 7.57 pCi/g in order to achieve a relative shift in the range of 1 and 3 (i.e., using a relative shift of 2.0). The required number of samples was 15, and the licensee took 20 soil samples on a fixed grid with a random start point, which is consistent with Table 5.5 of MARSSIM. Additionally, 4 judgmental soil samples were collected within the "French Drain" trench installed along the northern boundary of the survey unit. A soil sampling investigation level was established at 50% of the Cs-137 DCGL, or 3.97 pCi/g Cs-137, and a scan investigation was established for anything detectable above background. These investigation levels are consistent with investigation levels described in Table 5-5 of the licensee's LTP, and they are adequate per Table 5.8 of MARSSIM.

In addition to gamma measurements, the licensee performed analyses for HTD radionuclides on 2 randomly selected samples from the survey unit. This frequency of HTD analyses is consistent with guidance from MARSSIM Section 4.3.2.

The licensee's survey results indicated that Cs-137 was not identified in any of the soil samples collected for non-parametric statistical testing, and neither of the 2 HTD samples tested positive for Cs-137 or other plant derived radionuclides. No soil samples triggered an investigation. Since no sample exceeded the DCGL, the statistical test (i.e., Sign Test) was not required. As such, the licensee acknowledged that "the Sign Test was performed (by inspection) on the data and compared to the original assumptions of the DQOs," and that "the evaluation of the Sign Test results demonstrates that the survey unit passes the unrestricted release criteria, thus, the null hypothesis is rejected." NRC staff concludes that the licensee's survey and analyses for this survey unit provide reasonable assurance the licensee is able to demonstrate compliance with the unrestricted release criteria of 10 CFR 20.1402.

3.0 COMMENTS

The staff's review resulted in three comments for the licensee to consider as additional final status surveys are completed

1. The discussion of the consideration of HTD radionuclides from characterization surveys for HBPP-FSS-OOL 10-04 indicates that "an HTD analysis for samples reporting the highest values for plant-related ETD radionuclides (e.g., Cs-137) was not performed as no HTD radionuclides were identified in the four characterization samples analyzed," followed by a statement that "based on the low levels of residual radioactivity expected to be present, it is unlikely that any HTD radionuclides, if present, would collectively be identified at levels that were considered significant contributors to dose (i.e., >10% of the release limit)." A similar statement is made later in the FSS report that "Cs-137, the only nuclide that could potentially be present based on characterization data, was not scaled to account for any HTD nuclides that might be present," and that "however, it has been shown that even for Class 1 areas, the low potential for HTD nuclide dose was considered to be an insignificant contributor to TEDE for the critical exposure group evaluated (i.e., resident farmer)." NRC staff notes that the 10% threshold for insignificant contributors to dose is only a threshold at which licensees should provide detailed consideration and analyses for certain radionuclides. If radionuclides of concern are likely present, even at levels collectively below 10% of the compliance dose, then overall release criteria must be adjusted accordingly. In the case of HBPP-FSS-OOL 10-04, the NRC staff's evaluation considers that no HTD results have been identified during characterization, and there does not appear to be a reason to scale or adjust release criteria. However, for future reference the staff refers the licensee to guidance in NUREG-1757, Volume 2, Revision 1, Section 3.3 to ensure that any potential insignificant contributors to dose are appropriately addressed.
2. The FSS report for HBPP-FSS-OOL 10-04 notes that the licensee's Procedure RCP FSS-2 specifies that 5% of the samples are required to be selected for HTD analysis. NRC staff notes that MARSSIM Section 4.3.2 indicates that "if consistent radionuclide ratios cannot be determined during the Historical Site Assessment (HSA) based on existing information, MARSSIM recommends that one of the objectives of scoping or characterization be a determination of the ratios rather than attempting to determine ratios based on the final status survey." MARSSIM Section 4.3.2 further indicates that "if the ratios are determined using final status survey data, MARSSIM recommends that at least 10% of the measurements (both direct measurements and samples) include analyses for all

radionuclides of concern.” These statements in MARSSIM point to the importance of addressing HTDs during characterization or scoping, and a recommendation to use 10% of FSS samples is provided if FSS results are utilized to determine ratios. It appears that HTD analyses by the licensee were not used to establish surrogate ratios for HBPP-FSS-OOL 10-04 and HBPP-FSS-ISF01-01-00, but were used to assess the presence of HTDs. In both survey units, there were no positively identified HTDs. In the event that future decommissioning surveys do identify the presence of HTDs, the licensee should review MARSSIM and utilize the DQO process to ensure that HTDs are appropriately considered. NRC staff notes that for both HBPP-FSS-OOL 10-04 and HBPP-FSS-ISF01-01-00 the licensee evaluated 10% or more of the FSS samples for HTDs, which would be consistent with the recommended percentage in MARSSIM Section 4.3.2.

3. The FSS report for HBPP-FSS-ISF01-01-00 indicates that “a formal FSS was not conducted over the backfilled survey unit as it exists in the final site restoration condition as it supports the ISFSI as all materials used to restore this area either originated from the area and came from off-site,” and that “all reuse or off-site restoration materials met class 3 reuse requirements and did not contain HBPP-derived radionuclides above method detection levels.” Of particular relevance to the NRC staff’s evaluation of HBPP-FSS-ISF01-01-00 is the indication that no plant derived radionuclides were observed in reuse soil above detection levels. NRC staff notes that in the event that radionuclides of concern are able to be detected in reuse soils it would be necessary to assess the dose from those soils for the respective survey unit. This assessment of soils would be consistent with the definition of “residual radioactivity” for consideration in compliance with the radiological criteria for unrestricted use (i.e., 10 CFR 20.1402). In particular, 10 CFR 20.1003 defines “residual radioactivity” as follows:

Residual radioactivity means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee’s control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR part 20.

While this dose consideration appears to be no factor for HBPP-FSS-ISF01-01-00, the licensee should ensure that the assessment of reuse soils originating from radiologically impacted areas is performed to the rigor of an FSS and that the dose from any residual radioactivity identified is appropriately considered. The NRC staff notes that the assessment of reuse soils was previously addressed during the RAI process for the HBPP LTP evaluation, and the licensee’s approach to soil reuse was captured by PG&E Letter HBL-14-008 (as amended by an email from the licensee on April 02, 2014 [ML14204A150]).

4.0 CONCLUSION

NRC staff concludes that the survey results presented in the Final Status Survey Reports for survey units HBPP-FSS-OOL 10-04 and HBPP-FSS-ISF01-01-00 are adequate to provide reasonable assurance that the licensee is able to demonstrate compliance with the unrestricted release criteria of 10 CFR 20.1402.

Principal Contributor: John Clements, NMSS