October 21, 2003

Mr. Gregory M. Rueger
Senior Vice President, Generation and
Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Nuclear Power Plant
P.O. Box 3
Avila Beach, CA 93424

SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2 - ISSUANCE OF AMENDMENT – REVISED STEAM GENERATOR VOLTAGE-BASED REPAIR CRITERIA PROBABILITY OF DETECTION METHOD FOR DIABLO CANYON UNIT 2 CYCLE 12 (TAC NO. MB9742)

Dear Mr. Rueger:

The Commission has issued the enclosed Amendment No. 164 to Facility Operating License No. DPR-82 for the Diablo Canyon Nuclear Power Plant (DCPP), Unit No. 2. The amendment is in response to your application dated June 26, 2003, as supplemented by letters dated September 3 and September 30, 2003.

The amendment authorizes revisions to the Final Safety Analysis Report Update to incorporate the NRC approval of a revised steam generator voltage-based repair criteria probability of detection (POD) method for DCPP Unit No. 2. The revised POD, based on the probability of prior cycle detection method, is approved to determine the beginning of cycle voltage distribution for DCPP Unit 2 Cycle 12 operational assessment.

A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

/RA/

Girija S. Shukla, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-323

Enclosures: 1. Amendment No. 164 to DPR-82
2. Safety Evaluation

cc w/encls: See next page

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***Memo transmitting Safety Evaluation**

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PACIFIC GAS AND ELECTRIC COMPANY

DOCKET NO. 50-323

DIABLO CANYON NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 164
License No. DPR-82

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Pacific Gas and Electric Company (the licensee) dated June 26, 2003, and its supplements dated September 3 and September 30, 2003, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 164, the license is amended to authorize revision of the Final Safety Analysis Report (FSAR) Update, as set forth in the application for amendment by Pacific Gas and Electric Company dated June 26, 2003, and supplements dated September 3 and September 30, 2003. Pacific Gas and Electric Company shall update the FSAR Update to incorporate the description of the revised steam generator voltage-based repair criteria probability of detection method, based on the probability of prior cycle detection method, as described in the amendment application of June 26, 2003, and supplements dated September 3 and September 30, 2003, and the staff's Safety Evaluation attached to this amendment.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance. The implementation of the amendment includes the incorporation into the FSAR Update the changes discussed above, as described in the licensee's application dated June 26, 2003, and supplements dated September 3 and September 30, 2003, and evaluated in the staff's Safety Evaluation attached to this amendment.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: October 21, 2003

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 164 TO FACILITY OPERATING LICENSE NO. DPR-82

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT, UNIT 2

DOCKET NO. 50-323

1.0 INTRODUCTION

By application dated June 26, 2003, as supplemented by letters dated September 3, and September 30, 2003, Pacific Gas and Electric Company (PG&E or licensee) requested an amendment to Facility Operating License No. DPR-82 for the Diablo Canyon Nuclear Power Plant (DCPP), Unit No. 2. The proposed license amendment request (LAR) involves revisions to the Final Safety Analysis Report (FSAR) Update to incorporate the NRC approval of a revised steam generator (SG) voltage-based repair criteria probability of detection (POD) method for DCPP Unit No. 2. The revised POD, based on the probability of prior cycle detection (POPCD) method, is used to determine the beginning of cycle (BOC) voltage distribution for DCPP Unit 2 Cycle 12 operational assessment.

This is an exception to the guidance of Generic Letter (GL) 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking," dated August 3, 1995, and requires prior NRC review and approval.

GL 95-05 requires the application of the currently approved POD of 0.6 to all bobbin indications. The licensee stated that the use of the constant POD of 0.6 for determination of the BOC voltage distribution is nonconservative for indications below approximately 0.5 volts and excessively conservative for indications above 1 volt. The licensee indicated that the POPCD method provides a more realistic POD which is a function of voltage.

The September 3 and September 30, 2003, supplemental letters provided additional clarifying information, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination published in the *Federal Register* on July 22, 2003 (68 FR 43392).

2.0 REGULATORY EVALUATION

The licensee implements a voltage-based alternate repair criteria (ARC) for axial outside diameter stress corrosion cracking (ODSCC) located at tube-to-tube support plate intersections. The voltage-based plugging limits for axial ODSCC are discussed in GL 95-05. The NRC previously reviewed and approved the use of this ARC at DCPP Unit 2 through a license amendment modifying the DCPP Unit 2 Technical Specifications (TS). At that time, the licensee updated the DCPP FSAR Update to describe implementation of the voltage-based repair criteria in accordance with GL 95-05.

SG tube plugging/repair limits are specified in the DCPP Unit 2 TS. The current DCPP Unit 2 TS requires that flawed tubes be removed from service by plugging if the depths of the flaws are greater than or equal to 40 percent through-wall, unless the degradation can be dispositioned by one of the three ARC identified in the TS. One of these ARC is based on voltage (not depth) and can be implemented for axial ODSCC located at tube-to-tube support plate intersections. The associated TS plugging/repair limits and required analysis provide reasonable assurance that tubes remaining in service will retain adequate structural and leakage integrity during normal operating, transient, and postulated accident conditions, consistent with General Design Criteria 14, 15, 30, 31, and 32 of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A. Structural integrity refers to maintaining adequate margins against gross failure, rupture, and collapse of the SG tubing. Leakage integrity refers to limiting primary-to-secondary leakage to within acceptable limits (e.g., 10 CFR Part 100).

In order to ensure the structural and leakage integrity of a tube until the next scheduled inspection, GL 95-05 specifies a methodology to determine the conditional burst probability (i.e., ensure structural integrity) and the total primary-to-secondary leak rate (i.e., ensure leakage integrity) from an affected SG during a postulated main steam line break (MSLB) event. The calculation of conditional burst probability is, in part, a function of the POD and the resulting indication voltage distribution at the BOC. The indication voltage distribution at the BOC is based on consideration of all previous bobbin indications (i.e., all indications that were detected at the BOC, including those that are plugged). The licensee currently assumes a POD of 0.6 for all BOC indications, with one exception discussed below, as required by GL 95-05, which is described in the DCPP FSAR Update. A change to the POD results in a departure from a method of evaluation described in the FSAR Update. This change requires the licensee to submit an LAR for NRC review and approval.

The NRC recently authorized PG&E to use a POD of 1.0 for one bobbin indication identified during the Spring 2003 Unit 2 Refueling Outage 11 (2R11) SG inspection. This is the exception mentioned above. This indication was 21.5 bobbin volts and the licensee concluded that an indication of this size could be detected with 100 percent certainty. Based on the staff's evaluation of the licensee's proposal, industry operating experience, the axial ODSCC ARC inspection results at DCPP, and demonstrated bobbin probe capabilities, the staff agreed that it would be unlikely for the licensee to miss an indication as large as 21.5 volts. Accordingly, in a letter dated June 3, 2003, the NRC approved the licensee's proposal to use a POD of 1.0 for a 21.5 volt bobbin indication for the BOC voltage distribution for the DCPP Unit 2 Cycle 12 operational assessment (Reference 1).

3.0 TECHNICAL EVALUATION

3.1 Background

Use of the voltage-based ARC requires PG&E to take certain actions (e.g., inspections, repairs, and analysis). Based on the results of each SG inspection, the licensee is required to perform an analysis to determine the projected end-of-cycle (EOC) conditional burst probability and the total primary-to-secondary leak rate from each SG where the ARC is applied during a postulated MSLB event to ensure that these projections remain below acceptance limits (e.g., $1x10^{-2}$ and 10.5 gallons per minute (gpm), respectively). These analyses utilize Monte Carlo statistical analysis techniques to project the EOC voltage distribution. The projected EOC

voltage distribution is then used in conjunction with empirically derived correlations between the voltage (i.e., bobbin coil voltage) and tube burst pressure and leak rate to ensure the acceptance limits are met. The indication voltage distribution at BOC is based on consideration of all bobbin indications identified during that outage. The licensee assumes a POD of 0.6 for all BOC indications as stated in GL 95-05, and 1.0 for one large-voltage indication as previously described. These POD values are used, in part, to account for missed indications (i.e., present but not detected) and new indications that may initiate during the next operating cycle.

As previously described, a 21.5 volt bobbin indication was found in the SG 4 tube at row 44, column 45 during DCPP Unit 2 Refueling Outage 11. Subsequently, in a letter dated June 3, 2003, the NRC issued License Amendment No. 158 to Facility Operating License No. DPR-82 for DCPP Unit 2 that authorized revisions to the FSAR to incorporate the NRC approval to apply a POD of 1.0 to the 21.5 volt flaw for the BOC voltage distribution for the DCPP Unit 2 Cycle 12 operational assessment (Reference 1). PG&E indicated that the use of a POD of 1.0 for the 21.5 volt indication results in a conditional burst probability of less than $1x10^{-2}$ through October 2003. The primary-to-secondary leak rate limit of 10.5 gpm was not challenged through the end of Cycle 12. Implementation of the licensee's proposed POPCD method, the subject of this LAR, to determine the BOC voltage distribution for the DCPP Unit 2 Cycle 12 operational assessment will result in a conditional probability of burst that is less than the reporting limit of $1x10^{-2}$ for the duration of Unit 2 Cycle 12.

The licensee's proposed POD method is based, in part, on the POPCD method described in the Electric Power Research Institute (EPRI) Topical Report NP 7480-L, Addendum 5, "Steam Generator Tubing Outside Diameter Stress Corrosion Cracking at Tube Support Plates Database for Alternate Repair Limits," dated January 2003, which was submitted to the NRC in a letter from NEI dated February 17, 2003 (Reference 2). However, specific details related to the licensee's implementation of POPCD, such as classification of indications, voltage bin width, regression analysis, and reporting requirements, are modified and updated in the licensee's LAR.

3.2 POPCD Definition and Treatment of Inspection Data

PG&E is required to perform extensive inspections of the steam generator tubes with a bobbin probe every refueling outage. In addition, PG&E performs additional inspections of the SG tubes at tube-to-tube support plate intersections with a rotating pancake coil (RPC) probe. The results of these inspections are used in the development of the POPCD methodology. POPCD is calculated as the ratio of indications reported at the prior inspection, cycle n, to the total indications found at the subsequent inspection, cycle n+1 (i.e., all indications reported in the prior cycle plus new indications). POPCD for the end-of-cycle n (EOC_n) inspection is defined as:

$$POPCD = \frac{\text{EOC}_{n+1}\text{ RPC confirmed plus EOC}_n\text{ not RPC inspected and detected at EOC}_n \;+\; \text{RPC confirmed and repaired at EOC}_n}{\text{EOC}_{n+1}\text{ RPC confirmed plus not RPC inspected and detected at EOC}_n \;+\; \text{EOC}_n\text{ RPC confirmed and repaired at EOC}_n \;+\; \text{New EOC}_{n+1}\text{ RPC confirmed plus not RPC inspected indications (i.e., not detected at EOC}_n\text{)}}$$

Notes:

1. RPC is intended to include an RPC probe or equivalent, which includes a +Point coil.
2. "RPC confirmed" means a bobbin flaw signal was detected with an RPC probe.
3. "Not RPC inspected" means a flaw signal was detected with a bobbin probe and was not further inspected with an RPC probe.

This definition of POPCD is based on the premise that all bobbin indications that can contribute significantly to burst and leakage during the next operating cycle can be confirmed (i.e., detected) by RPC inspections. For the purposes of POPCD, RPC inspection results are assumed to be "truth." That is, an indication detected via an RPC inspection is assumed to mean a flaw is present, regardless of the results of the inspection with a bobbin probe. And, conversely, the absence of an RPC indication is assumed to mean that no flaw is present that can contribute significantly to burst or leakage during the next operating cycle. POPCD treats all new bobbin and RPC indications at an inspection as having been undetected at the prior inspection, and is included in POPCD calculations, even though some of the new indications may have initiated during the operating cycle. Therefore, the application of POPCD attempts to account for newly initiated indications, as well as previously undetected indications.

Table 2-1 in Enclosure 1 to the PG&E letter dated September 30, 2003, (Reference 3), "Generic Data Table for Tracking Indications Between EOC_n and EOC_{n+1}," identifies how inspection data will be transposed to the "POPCD data table" which is used for calculating the voltage-based POPCD. The "POPCD data table" being used by PG&E for DCPP Unit 2 Cycle 12 is identified in Table 2 in Enclosure 1 to the PG&E letter dated September 3, 2003, (Reference 4), "DCPP New NRC POPCD Data." The use of these two tables clearly identifies how inspection results (e.g., detected with bobbin, not detected with bobbin, detected with RPC, etc.) are treated for the purposes of POPCD. For the purposes of the POPCD definition above, indications are treated as detected (numerator and denominator) or not-detected (denominator).

Table 2-1 in Reference 3 indicates that indications that were confirmed (i.e., detected) with an RPC probe during EOC_n will be inspected with an RPC probe during the EOC_{n+1} inspection if the indication is not detected with the bobbin probe during EOC_{n+1}. For the purposes of POPCD, RPC inspection results are considered “truth” and, therefore, RPC confirmation of the indication during EOC_n indicates that a flaw is present at that location. If the indication is not detected

with a bobbin probe during the EOC_{n+1} inspection, this would imply a potentially inaccurate bobbin probe inspection result. Therefore, it is critical that an RPC probe inspection be performed during EOC_{n+1} to ensure that all known ODSCC indications are included in the GL 95-05 calculations. PG&E indicated that there were twelve occurrences of inspection results in this category during prior SG tube inspections that were not inspected with an RPC probe, but that in the future, there would be no occurrences of this category based on PG&E's commitment to perform RPC inspections at EOC_{n+1}. These 12 occurrences were assessed by PG&E which concluded that the Plus Point voltage of these indications were all less than or equal to 0.36 volts (i.e., similarly low bobbin voltage), and that inclusion of these data points in the POPCD calculations would produce negligible changes to the EOC Cycle 12 leak rate and conditional burst probability predictions.

Indications that were confirmed (i.e., detected) with an RPC probe during EOC_n that are inspected, but not detected with an RPC probe during EOC_{n+1} could appear to be "disappearing flaws" since RPC inspection results are considered "truth." Therefore, Table 2-1 in Reference 3 indicates that the causative factors for this change in RPC detection will be discussed in the ARC 90-day report for all indications with a Plus Point voltage > 0.5 volts. In addition, the licensee stated that these indications will be evaluated in the 90-day report, irrespective of Plus Point voltage, if there is a significant number of occurrences in this category. PG&E indicated that there were four occurrences of indications in these categories during previous SG tube inspections. These indications were evaluated for causative factors, irrespective of Plus Point voltage, in the September 3 (Reference 4) and September 30 (Reference 3) letters. The licensee determined that the indications were very small in voltage, non-flawlike, and/or very conservative calls and concluded that the change in RPC detection had reasonable explanations and would not have affected POPCD calculations if the inspection result had been different.

For the POPCD evaluation, all determinations of bobbin and RPC "detection" at EOC_n and voltages assigned to EOC_n detected indications are to be based exclusively on the inspection records from the EOC_n inspection. Lookback analyses of the EOC_n data are only applied to assign EOC_n voltages for new indications detected at EOC_{n+1} (i.e., EOC_n voltages are not available from the inspection records). If the indication cannot be assigned a voltage at the EOC_n inspection based on a lookback analysis, the licensee will estimate the EOC_n voltage by reducing the EOC_{n+1} voltage by the average voltage growth for the cycle.

The staff agrees with the definition of POPCD and the treatment of inspection results for the purposes of POPCD because they treat the inspection data in a conservative manner.

3.3 Statistical Generalized Linear Model (GLM) Regression Analyses

The "POPCD data table" being used by PG&E for DCPP Unit 2 Cycle 12 is identified in Table 2 in Enclosure 1 to the PG&E letter dated September 3, 2003, (Reference 4), "DCPP New NRC POPCD Data." The data from this table (i.e., voltage bin versus POPCD value for each voltage bin) are then utilized in a statistical GLM regression analyses to develop a POPCD cumulative distribution function. The data from this table are sorted into 0.1-volt bins representing various voltage levels (e.g., 0.21 to 0.3 volts) and the POPCD distributions are developed using fits to weighted binary data, where weighting is based on the number of indications in each bin. Monte Carlo techniques are then used to apply the POPCD curves to the distribution of

indications found during the outage to develop the next cycle BOC indication voltage distribution. The Monte Carlo techniques are described in detail in Section 4.2 of Enclosure 1 to the June 26, 2003, letter (Reference 5).

DCPP plant-specific POPCD data are available from five cycles of operation based on the two inspections at Unit 1 and three inspections at Unit 2 since implementation of the voltage-based ARC criteria at each unit. The combined data for the five outages are given in Table 2 in Enclosure 1 to the PG&E letter dated September 3, 2003, (Reference 4), "DCPP New NRC POPCD Data." DCPP has an adequate database to define a plant-specific POPCD, and PG&E concluded a multi-cycle database, utilizing the results from all five inspections at DCPP, is more reliable because SG conditions at tube support plate intersections are not significantly degrading with operating time and the POPCD distribution would not be as dependent on the number and size of indications identified in a given inspection.

Additionally, PG&E is utilizing a Monte Carlo technique to simulate the uncertainties in the DCPP plant-specific POPCD to support the operational assessment for Unit 2 Cycle 12. The licensee concluded that the statistical applications in developing the DCPP POPCD distribution together with accounting for POD uncertainties in the operational assessment adequately address uncertainties in both the lower and upper voltage range.

The staff agrees with the licensee's proposed use of the statistical generalized linear model regression analysis because it is a commonly used statistical analysis technique and is technically appropriate to use in these conditions. In addition, the staff agrees with the use of a multi-cycle, plant specific POPCD. DCPP has an acceptable number of data points, and the treatment of uncertainties through Monte Carlo techniques is technically defensible.

3.4 Reporting Requirements

PG&E committed to the following reporting requirements, as stated in the application dated June 26, 2003, and its supplements dated September 3 and September 30, 2003.

- Update the "POPCD data table" identified in Table 2 in Enclosure 1 to Reference 4, and the "POPCD matrix table" identified in Table 2-1 in Enclosure 1 to Reference 3 with plant-specific results in the 90-day report.

- An assessment is required in the SG 90-day report for RPC no detectable degradation (NDD) indications that were RPC confirmed at EOC_n ("disappearing flaws"), if the Plus Point voltage is greater than 0.5 volts. However, if there is a significant number of occurrences of this category, irrespective of the Plus Point voltage, PG&E will evaluate the cause in the Unit 2 Cycle 12 90-day report. (Previously discussed in Section 3.2 of this safety evaluation.)

- If the EOC conditional burst probability, projected steam line break leak rate, or the largest indications (number and size) are underpredicted by the previous cycle operational assessment, the probable causes for the underpredictions will be assessed and documented in the DCPP Unit 2 Cycle 12 90-day report. If the underpredictions are significant relative to the burst pressure reporting threshold or site-specific allowable leak rate, an assessment must be made of the potential need to revise the ARC analysis

methods, and this assessment will be documented in the DCPP Unit 2 Cycle 12 90-day report. A significant underprediction of burst probability is defined as 10 percent of the reporting threshold (i.e., 0.001). A significant underprediction of steam line break leak rate is defined as 0.5 gpm (response to NRC Question No. 7 [Reference 6]). A methods assessment will also be made for smaller burst probabilities or leak rates if the condition monitoring results are underpredicted by an order of magnitude.

– If the total number of as-found indications is underestimated by greater than 15 percent, a methods assessment will be performed to determine the cause, and corrective actions will be proposed in the 90-day report, including an assessment of the need to increase the number of predicted low voltage indications at the BOC to determine the effect on EOC projections.

– To assess POPCD for potential changes over time, the DCPP Unit 2 Cycle 12 90-day report will compare the multi-cycle POPCD distribution with the Unit 2 Cycle 12 POPCD distribution. Differences in the two POPCD distributions will be assessed relative to the potential for significant changes in detection capability.

The staff agrees with these reporting requirements since PG&E will monitor important variables and inspection results and determine whether a change to the predictive methodology is warranted.

3.5 Benchmarking of the Methodology and EOC12 Predictions

The staff requested PG&E to benchmark the POPCD methodology to assess its ability to conservatively project the EOC voltage distribution. In Section 4.5 of the June 26, 2003, letter (Reference 5), the licensee benchmarked the DCPP POPCD distribution for the last operating cycle against the Cycle 11 SG inspection results. The staff raised additional questions regarding the benchmarking request as part of its review of the DCPP Unit 2 eleventh refueling outage steam generator inspection results report (Reference 7). The licensee responded to the staff's questions in a letter dated September 30, 2003 (Reference 6). The benchmarking results, contained in Table 3-2 to the September 30, 2003 letter (Reference 6), indicate that the methodology used to predict EOC conditions was not conservative in all cases. However, the underpredictions, for the most recent cycle, were not significant relative to the as-found inspection results.

Since DCPP Unit 2 began operating following the Spring 2003 refueling outage, the licensee has performed multiple calculations, using different methodologies, to predict the EOC 12 conditional probability of burst and leak rate values. These calculations were performed in response to NRC questions and as a sensitivity analysis for key input assumptions and parameters to assist the licensee in identifying the most appropriate method for conservatively predicting the EOC 12 conditions. Different results were obtained for each calculational methodology used. In response to a staff question, the licensee provided the EOC 12 predictions for the conditional probability of burst and leak rate values that PG&E plans to utilize as the final predictions that are the most appropriate for Diablo Canyon Unit 2 Cycle 12. These predictions will be used for comparisons against the as-found Unit 2 refueling outage twelve SG inspection results (Response to NRC Question 11 in Reference 6). The licensee concluded that the worst-case steam generator, SG 2-4, had a conditional probability of burst of

5.94 x 10^{-3} and a predicted steam line break leak rate of 2.86 gpm. These predictions have reasonable margin when compared to the reporting thresholds of 1.0 x 10^{-2} and 10.5 gpm, respectively.

3.6 Other Considerations

During the Spring 2003 refueling outage, two issues were identified relative to the voltage-based ARC which led to the licensee's conclusion that the Cycle 12 conditional burst probability would exceed the 1 x 10^{-2} reporting criteria in October 2003. This led to the submittal of this LAR to modify the POD. The issues were: identification of a 21.5 volt flaw, and identification of an unpredicted number of flaws with high voltage growth rates. PG&E has taken corrective actions, summarized below, to address these issues. Additional details related to these issues and subsequent corrective action can be found in the DCPP NRC Special Team Inspection Report (Reference 8).

- Plugged all tubes with axial ODSCC indications greater than 1.2 bobbin volts (this is lower than what DCPP Unit 2 TSs require, i.e., plugging axial ODSCC indications at tube support plate intersections that are greater than 2.0 bobbin volts);

- Inspected all axial ODSCC indications greater than 1.0 bobbin volts with a rotating probe in all 4 steam generators to identify and remove from service indications with a potential for significant voltage growth over the next operating cycle;

- Inspected a significant number of axial ODSCC indications less than or equal to 1.0 bobbin volts with a rotating probe in SG 2-1 to identify and remove from service indications with a potential for significant voltage growth over the next operating cycle;

- Inspected a sample of axial ODSCC indications less than or equal to 1.0 bobbin volts with a rotating probe in SG 2-2, 2-3 and 2-4 to identify and remove from service indications with a potential for significant voltage growth over the next operating cycle;

- Performed detailed flaw profiling using rotating probe inspection data for a significant number of the larger bobbin voltage flaws to identify and remove from service indications with a potential for significant voltage growth over the next operating cycle; and

- Pulled portions of two tubes containing significant axial ODSCC flaws to enable laboratory burst, leakage and metallurgical tests. Laboratory test results indicated that the flaws were not as significant, in terms of structural and leakage integrity, as the licensee's worst-case analysis predicted based on eddy current flaw profile estimates.

3.7 Conclusion

Based on the evaluation presented above, the staff has concluded that the licensee provided reasonable justification for approval to use POPCD at DCPP Unit 2 to determine the BOC Cycle 12 voltage distribution. The predicted EOC 12 conditional burst probability and leak rate projections have reasonable margin when compared to the reporting thresholds of 1.0 x 10^{-2} and 10.5 gpm, respectively. In addition, although the benchmarking results indicate that the

methodology used to predict EOC conditions was not conservative in all cases, the under predictions for the previous cycle were not significant relative to the as-found results. Additionally, the licensee took multiple corrective actions during the Spring 2003 Unit 2 refueling outage, which provide additional confidence that the conditional burst probability and leak rate projections will not exceed the reporting thresholds at the EOC 12. Therefore, the staff has concluded that the use of POPCD at DCPP Unit 2 to determine the BOC voltage distribution for DCPP Unit 2 Cycle 12 operational assessment is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the California State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (68 FR 43392). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Letter from David H. Jaffe, NRC, to Gregory M. Rueger, PG&E, "Diablo Canyon Nuclear Power Plant, Unit No. 2 - Issuance of Amendment - Alternate Method of Determining Probability of Detection for Steam Generator Tubes (TAC No. MB7875)," dated June 3, 2003.

2. Letter from Alex Marion, NEI, to the NRC, "Steam Generator Degradation Specific Management Database, Addendum 5," dated February 17, 2003.

3. Letter from David H. Oatley, PG&E, to the NRC, "Response to NRC Request for Additional Information Regarding License Amendment Request 03–10, Revised Steam Generator Voltage-based Repair Criteria Probability of Detection Method for Diablo Canyon Unit 2 Cycle 12," dated September 30, 2003.

4. Letter from David H. Oatley, PG&E, to the NRC, "Supplemental Information to Support License Amendment Request 03-10, Revised Steam Generator Voltage-based Repair Criteria Probability of Detection Method for Diablo Canyon Unit 2 Cycle 12," dated September 3, 2003.

5. Letter from David H. Oatley, PG&E, to the NRC, "License Amendment Request 03–10, Revised Steam Generator Voltage-based Repair Criteria Probability of Detection Method for Diablo Canyon Unit 2 Cycle 12," dated June 26, 2003.

6. Letter from Lawrence F. Womack, PG&E, to the NRC, "Diablo Canyon Unit 2, PG&E Response to NRC Questions on 2R11 Steam Generator Tube Inspections," dated September 30, 2003.

7. Letter from Lawrence F. Womack, PG&E, to the NRC, "Special Report 03-02 - Results of Steam Generator Inspections for Diablo Canyon Power Plant Unit 2 Eleventh Refueling Outage," dated June 23, 2003.

8. Letter from Charles S. Marschall, NRC to Gregory M. Rueder, PG&E, "Diablo Canyon Power Plant – NRC Special Team Inspection Report 50-323/03-09," dated May 8, 2003.

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