TREAT AS SENSITIVE INFORMATION

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PG&E Letter DCL-04-104

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

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Request for Additional Information Regarding License Amendment Request 04-01, "Revised Steam Generator Voltage-based Repair Criteria Probability of Detection Method for DCPP Units 1 and 2"

Dear Commissioners and Staff:

PG&E Letter DCL-04-028, dated March 18, 2004, submitted License Amendment Request (LAR) 04-01, "Revised Steam Generator Voltage-based Repair Criteria Probability of Detection Method for DCPP Units 1 and 2." LAR 04-01 proposes to update the Diablo Canyon Power Plant (DCPP) Final Safety Analysis Report Update to use a revised steam generator (SG) voltage-based repair criteria probability of detection (POD) method using plant specific SG tube inspection results. The proposed POD method is referred to as the probability of prior cycle detection (POPCD) method. The proposed POPCD method would be used for all remaining cycles for DCPP Units 1 and 2 until SG replacement, starting with DCPP Unit 1 Cycle 13 and DCPP Unit 2 Cycle 13.

On June 15, 2004, the NRC staff requested additional information required to complete the review of LAR 04-01. PG&E's responses to the staff's questions are provided in Enclosure 1. LAR 04-01 originally proposed no Technical Specification (TS) changes. In response to Question 2, as detailed in Enclosure 1, PG&E proposes to add additional reporting guidelines to TS 5.6.10, "Steam Generator (SG) Tube Inspection Report," page 5.0-30. Enclosure 2 provides the marked-up TS page, and Enclosure 3 provides the retyped TS page to reflect this change.

A change to TS 5.6.10, "Steam Generator (SG) Tube Inspection Report," page 5.0-30 has also been proposed in PG&E Letter DCL-03-132, "License Amendment Request 03-15, Steam Generator Tube Repair Using Leak Limiting Alloy 800 Sleeves and Revision to Technical Specification Table 5.5.9-2, 'Steam Generator (SG) Tube Inspection,'" dated October 22, 2003. If LAR 03-15 is approved before LAR 04-01, new TS markups will be provided.

A001

This information does not affect the results of the technical evaluation or the no significant hazards consideration determination previously transmitted in PG&E Letter DCL-04-028.

If you have any questions, or require additional information, please contact Stan Ketelsen at (805) 545-4720.

Sincerely,

FOR

David H. Oatley
Vice President and General Manager – Diablo Canyon

JER1/3664
Enclosures
cc: Edgar Bailey, DHS
Bruce S. Mallett
David L. Proulx
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cc/enc: Girija S. Shukla

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of PACIFIC GAS AND ELECTRIC COMPANY	Docket No. 50-275 Facility Operating License No. DPR-80
Diablo Canyon Power Plant Units 1 and 2	Docket No. 50-323 Facility Operating License No. DPR-82

AFFIDAVIT

James R. Becker, of lawful age, first being duly sworn upon oath says that he is Vice President – Diablo Canyon Operations and Station Director of Pacific Gas and Electric Company; that he has executed this response to the NRC request for additional information on License Amendment Request 04-01 on behalf of said company with full power and authority to do so; that he is familiar with the content thereof; and that the facts stated therein are true and correct to the best of his knowledge, information, and belief.

James R. Becker
Vice President – Diablo Canyon Operations and Station Director

Subscribed and sworn to before me this 18th day of August 2004.

Notary Public
County of San Luis Obispo
State of California

CHUCK MACKEY
Commission # 1397547
Notary Public - California
San Luis Obispo County
My Comm. Expires Feb 1, 2007

PG&E Response to NRC Request for Additional Information Regarding License Amendment Request 04-01, "Revised Steam Generator Voltage-Based Repair Criteria Probability of Detection Method For DCPP Units 1 and 2."

NRC Question 1:

In your March 18, 2004 license amendment request (LAR) you indicated that an outlier growth methodology, which is to be used with the proposed probability of prior cycle detection (POPCD) method, is under development. Please discuss the current status. If complete, please provide a copy.

PG&E Response:

The methods assessment for including the influence of extreme (outlier) growth values in alternate repair criteria (ARC) analyses has been completed, and was submitted to the NRC in Enclosure 2 to the NEI letter dated June 2, 2004, "Generic Letter [GL] 95-05 Alternate Repair criteria Methodology Updates." A revised version of the report was submitted to the NRC in the NEI letter dated July 9, 2004, "Revision to ODSCC [outside diameter stress corrosion cracking] ARC Task - Extreme Values of ODSCC ARC Growth." Five potential methods were evaluated in the report, and the recommended method, described in Section 6.3 of the report, is based on sampling the frequency and distribution of large extreme growth values based on historical industry data. The response to Question 9e below includes end-of-cycle (EOC)-12 analyses for Diablo Canyon Power Plant (DCPP) Unit 1 and Unit 2 with and without the extreme growth methods.

NRC Question 2:

The POPCD is used in conjunction with voltage growth rate distributions and non-destructive examination models to project the end-of-cycle flaw distributions. Together, these three models (and potentially a fourth model on outlier growth) are intended to result in a conservative projection of the as-found conditions at the time of the next inspection. This approach assumes that the flaws missed at the "next" inspection are inconsequential from a structural or leakage integrity standpoint. Each of these models is based on empirical data and statistical analyses are used to assess and apply these models. These models are intended to account for the missing of flaws during an inspection, the initiation of new flaws during the cycle, the growth of flaws, the variability associated with analyst sizing of the flaws, and the effects of probe wear on the sizing of the flaws.

As a result of the changes being proposed to these models and the importance of these models at assessing the integrity of the steam generator (SG) tubes, please discuss your plans for modifying Technical Specification (TS) 5.6.10 to require providing an assessment of the methodology for predicting the end-of-cycle *conditions along with a description of your planned corrective actions if the existing methodology does not conservatively project the end-of-cycle conditions.*

PG&E Response:

Section 4.1.4 of LAR 04-01 provides 90-day reporting guidelines that are applied to assess the need for methods adjustments. These reporting guidelines will be included in new section i of TS 5.6.10, as follows:

"i. For implementation of the probability of prior cycle detection (POPCD) method, for the voltage-based repair criteria at tube support plate intersections, if the end-of-cycle conditional main steamline break burst probability, the projected main steamline break leak rate, or the number of indications are underpredicted by the previous cycle operational assessment, the following shall be reported to the Commission pursuant to 10 CFR 50.4 within 90 days following return to service of the steam generators:

1) The assessment of the probable causes for the underpredictions, proposed corrective actions, and any recommended changes to probability of detection or growth methodology indicated by potential methods assessments.

2) An assessment of the potential need to revise the alternate repair criteria analysis methods if: the burst probability is underpredicted by more than 0.001 (i.e., 10% of the reporting threshold) or an order of magnitude; or the leak rate is underpredicted by more than 0.5 gpm or an order of magnitude.

3) An assessment of the potential need to increase the number of predicted low voltage indications at the beginning of cycle if the total number of as-found indications in any SG are underestimated by greater than 15% or by greater than 150 indications."

Enclosure 2 provides the marked-up TS page, and Enclosure 3 provides the retyped TS page to reflect this change.

PG&E's recommended guideline that would be used to account for an underestimate of the as-found indications attributable to low voltage indications is described in the response to Question 9d.

NRC Question 3:

On page 7 of Enclosure 1 to your submittal, you indicate that the "single-cycle basis" for the POPCD method evaluation assumes that large flaws would be detected during the EOCn+1 inspection. Please clarify what is meant by single-cycle basis.

Please clarify whether the data from all previous cycles are used in the determination of POPCD (i.e., a minimum of 3 consecutive inspections is needed to apply a plant-specific POPCD).

PG&E Response:

The single-cycle basis for POPCD is meant to convey that data are evaluated for one cycle to obtain a set of POPCD detection and non-detection data. The single-cycle data sets for detection and non-detection are then added to obtain a multi-cycle POPCD database. For the DCPP-specific POPCD through Unit 1 Cycle 12 completed in March 2004, data from 6 consecutive DCPP Unit 1 and Unit 2 cycles are used, which exceeds the recommendation for a minimum of 3 consecutive cycles of data. The single-cycle basis terminology was also used to emphasize that the voltage for an undetected indication would be based on the last inspection prior to being detected to maximize the voltage as compared to a multi-cycle lookback to an earlier cycle to define non-detection.

NRC Question 4:

In the fourth bullet on page 9 of Enclosure 1 to your submittal, you indicate that if new EOCn+1 indications are found by rotating pancake coil (RPC) inspection but not reported as EOCn+1 bobbin indications, the voltages for EOCn+1 may be obtained by identifying the flaw based on a review of the 200 kHz data or by applying a bobbin voltage to RPC voltage correlation. Regarding this statement, please clarify if the 200 kHz signal is from the bobbin coil data. If the 200 kHz signal is from the bobbin coil, please clarify why the indication would not have been called during the standard bobbin coil data analysis. That is, the statement as written (assuming it applies to the bobbin coil data) implies that the 200 kHz channel is not being used to identify flaws that may be present in this channel but not in the mix channel. Please clarify your inspection practices in this regard.

PG&E Response:

The 200 kHz signal is from the bobbin coil data.

For the standard bobbin coil data analysis, conducted prior to the results of Plus Point coil inspections, the 400/100 kHz mix channel is the primary detection channel for tube support plate (TSP) ODSCC and is evaluated for presence of flaw signals. The 200 kHz raw data channel may be evaluated to assist in the detection of small ODSCC indications in addition to the 400/100 kHz mix channel. This practice is consistent with Appendix A of WCAP-12985, Revision 1, "Kewaunee Steam Generator Tube Plugging Criteria for ODSCC at Tube Support Plates," which was referenced as acceptable analysis methodology in NRC GL 95-05.

When there is a known flaw from the Plus Point coil data, and the flaw was not detectable by the standard bobbin coil data analysis, the 200 kHz bobbin coil data is reviewed in order to place the measurement dots and carry over to the 400/100 kHz mix channel for reporting. This method is described in Section 10.1.2 of EPRI Report 1007660, "Steam Generator Tubing Outside Diameter Stress Corrosion Cracking at Tube Support Plates Database for Alternate Repair Limits." If there is no signal present in the 200 kHz review, the flaw is termed as axial ODSCC not detectable by bobbin (AONDB), and a bobbin coil voltage is assigned based on the RPC/bobbin coil voltage correlation.

<u>NRC Question 5:</u>

In the fifth bullet on page 9 of Enclosure 1 to your submittal, you indicate that if the RPC inspection identifies more than one ODSCC indication at the same TSP intersection, the bobbin voltage assigned to the TSP is estimated as the square root of the sum of squares (SRSS) for the bobbin voltages inferred from the RPC indications. Please clarify if this technique is only used in instances where the indications are only detected by rotating probe and a review of the 200 kHz bobbin data does not identify a flaw (i.e., should it be considered a sub-bullet to the fourth bullet). Please provide data supporting the adequacy of this approach. For example, provide data in which bobbin indications were RPC confirmed as multiple axial indications and compare the bobbin voltage for these indications to the voltage obtained using the square root of the sum of the squares approach applied to the rotating probe voltages.

<u>PG&E Response:</u>

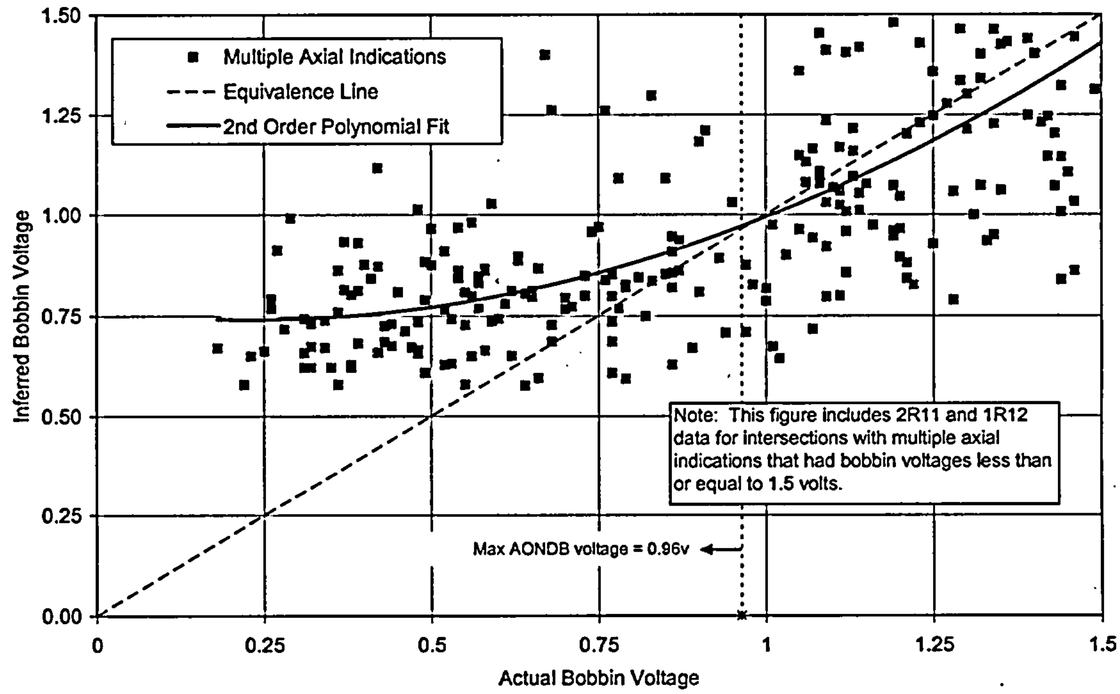
The technique described in NRC Question 5 is only used in instances where the indications are only detected by rotating probe and a review of the 200 kHz bobbin coil data does not identify a flaw. In the most recent outages at each unit, Unit 1 refueling outage 12 (1R12) and Unit 2 refueling outage 11 (2R11), there were a total of 129 intersections identified as containing AONDB. Only twelve of these intersections contained multiple axial indications and were subjected to the SRSS method for determining the inferred bobbin voltage. PG&E previously provided information on the progression of AONDB indications in a response to NRC questions on the 1R11 inspection results in PG&E Letter DCL-03-113, "PG&E Response to NRC Questions on 1R11 Steam Generator Tube Inspections," dated September 15, 2003 (see response to ODSCC ARC Question 2).

Figure 1 below shows the inferred bobbin coil voltages plotted against the actual bobbin coil voltages for the intersections which were confirmed as having multiple axial indications by Plus Point coil. This figure includes intersections that had bobbin coil voltages of less than or equal to1.5 volt and includes data from the most recent inspections performed during DCPP Unit 2 Refueling Outage No. 11 (2R11) and Unit 1 Refueling Outage No. 12 (1R12). The 1.5 volt cutoff was selected based on the maximum inferred voltage for an AONDB flaw. The maximum AONDB voltage over the last two inspections was 0.96 volts. This inferred voltage was for an intersection that had two axial indications and was taken from a population of 129 intersections with inferred AONDB voltages. As shown in Figure 1, the inferred bobbin coil voltages are overpredicted on average in the area of interest (less than 1 volt). Since the SRSS method for estimating a bobbin coil voltage is only used in cases where a bobbin coil signal is not detected (i.e., small indications), this method is deemed appropriate and conservative.

A polynomial fit of the inferred to actual voltage data is also shown in Figure 1 below, and reflects the influence of the overestimates for the inferred voltages below about 1 volt.

Figure 1

Actual vs. Inferred Bobbin Voltages for MAIs 2R11 and 1R12



NRC Question 6:

On page 10 of Enclosure 1 to your submittal, you indicate that if the p-value is found to be greater than 5 percent, a probability of detection of 0.6 will be assumed. You indicated that the implications of such a p-value is that there could be sufficient noise at the location of the indications to interfere with the detection of indications. Please clarify this paragraph. In addition, please address why a 0.6 probability of detection would be adequate in these circumstances.

PG&E Response:

The p-value could theoretically increase due to noise interfering with the detection of indications; however, this is likely to occur only for small indications. The p-value for the DCPP POPCD distribution is effectively zero, and there is an extremely low probability that the p-value would increase to above 5-percent. Use of a default probability of detection (POD) of 0.6 if the p-value exceeds 5 percent is based on the value specified in GL 95-05. However, if the cause for the high p-value is noise at low voltage indications, a POD of 0.6 may not be adequately conservative. If the DCPP POPCD results in a p-value greater than 5 percent, PG&E will propose an alternate POD and submit the recommendation to the NRC for approval to apply for DCPP operational assessments.

NRC Question 7:

On page 13 of Enclosure 1 to your submittal, you discuss an augmented inspection program in which rotating probe examinations are performed on bobbin indications exceeding 1.7 volts. The initial program includes performing a 20 percent sample which is expanded to 100 percent if a Plus Point indication exceeding 1.9 volts is detected. Given the low likelihood of observing an "outlier growth rate", it would seem that a 100 percent sample would be needed to provide confidence that an "outlier growth" is not observed. Please discuss this issue (i.e., the technical basis for a 20 percent sample).

PG&E Response:

The guidelines for the augmented RPC inspection program are provided in Enclosure 1 of the NEI letter to the NRC dated April 13, 2004, "ARC Guidelines for Preventive Repair of Large +Point Indications and Noise Requirements for Voltage Based ARC." The report suggests that a 20 percent sample inspection be performed. The NEI industry program is a generic plan independent of POPCD and the 20 percent sample is judged to provide adequate conservatism when used in combination with a POD of 0.6. In 1R12, PG&E elected to exceed the recommendation and performed 100 percent Plus Point coil inspection of bobbin coil indications exceeding 1.7 volts, then lowered the Plus Point coil inspection threshold to 1.4 volts in SG 1-1 and 1-2 as an additional preventive measure. No large Plus Point coil indications were detected in this program (largest Plus Point coil voltage returned to service was 1.63 volts with bobbin coil voltage of 1.96 volts), and no preventive plugging was performed. Upon NRC multi-cycle approval of POPCD, PG&E will perform a 100 percent Plus Point coil inspection of all bobbin coil indications above 1.7 volts at TSP intersections applying a 2 volt ARC. For "locked" TSP intersections when implemented at DCPP, the need for an augmented RPC inspection program will be based on leakage considerations. The locked TSPs prevent burst but higher leak rates could result from indications restricted from burst (IRBs). PG&E will monitor the results of RPC inspections and predicted leakage margins to assess the need for further RPC inspections to identify potential high RPC voltage indications having an increased likelihood for outlier growth.

NRC Question 8:

On page 13 of Enclosure 1 to your submittal, you indicate "GL 95-05 requires the use of the most limiting of the two previous growth rate distributions for the next operating cycle and WCAP-14277, Revision 1, recommends that the more conservative growth (relative to predicting leakage and burst) between the distributions for the specific SG, and for all SGs collectively, should be used." Please clarify whether you believe there is a difference between GL 95-05 and WCAP-14277 regarding the use of the most conservative growth. Since the use of the most limiting of the two previous growth rate distributions, as discussed in GL 95-05, is intended to result in the most conservative prediction of leakage and burst, it is not clear what the purpose of this statement is. Does the statement imply that the most limiting of the two previous growth rate distributions may not result in the most conservative prediction of leakage and burst?

PG&E Response:

GL 95-05 does not define requirements for selecting growth distributions for individual SGs. Therefore, it is common industry and DCPP practice to implement the guidance in WCAP-14277, Revision 1, "SLB Leak Rate and Tube Burst Probability Analysis Methods for ODSCC at TSP Intersections," dated December 1996, by comparing the SG-specific distributions and the composite SG distribution, and choosing the more conservative of the two for the SG-specific ARC analysis. This application of the WCAP-14277, Revision 1, growth methodology can be more conservative than the GL 95-05 methods dependent upon differences between the composite and SG-specific growth distributions.

A description of the steps that PG&E follows for determination of the growth distributions to be used for operational assessments is provided below. These steps are recommended as guidelines based on PG&E's current understanding of information contained in various guidance documents (e.g., GL 95-05, WCAP-14277 Revision 1, Enclosure 3 of the NEI letter to NRC dated June 2, 2004), in addition to knowledge gained as part of comprehensive evaluations of ODSCC growth rates at DCPP Units 1 and 2. If future inspection results provide additional information that could alter these guidelines, PG&E would provide recommended changes to the guidelines and basis for the changes in the subsequent 90 day report.

1. Prepare cumulative probability distribution function (CPDF) curves for each of last two cycles (SG-specific and composite). When POPCD is applied, then any indications having growth rates greater than 5 volts per effective full power year (EFPY) should be excluded from these curves. Growth rates greater than 5 volts/EFPY are included in the extreme growth distribution.

2. For each SG, select the limiting (relative to projecting leakage and probability of burst) of the following four growth curves (SG-specific for Cycle n, SG-specific for Cycle n-1, composite for Cycle n, and composite for Cycle n-1). The determination of the limiting growth curve can usually be determined by comparing the four CPDF curves mentioned above. In some cases, however, it may be necessary to perform analyses for voltage-dependent growth (Step 3) and delta volts adjustment (Step 4) to determine which growth curve is limiting. In such cases, it may also be necessary to perform probability of burst (POB) and leak rate sensitivity calculations using the different growth curves to determine which curve is limiting.

    a. GL 95-05 and WCAP-14277, Revision 1, both require 200 data points across all SGs in order to use a site-specific growth curve. This requirement is no longer applicable to DCPP since both units have well over 200 data points for their respective growth distributions.

    b. Per Revision 1 of WCAP-14277, a SG-specific growth curve should contain at least 200 data points. This implies that a composite curve across all SGs should be used when the SG-specific curve has less than 200 indications. For this guideline, however, DCPP is going to take a more conservative approach of selecting the limiting growth curve regardless of the number of indications in the SG-specific growth distribution.

3. For each curve selected from Steps 1 or 2, analyze the growth curve for signs of voltage dependent growth (VDG). As noted in Step 2, the analysis for voltage dependent growth may need to be done prior to selecting the limiting growth distribution.

    a. Plot the individual growth data on a 'scatter' chart with beginning of cycle (BOC) voltages on the x-axis and voltage growth rates on the y-axis. Perform a simple linear regression on these data. If the slope is greater than about 0.1, then VDG should be considered in the operational assessment projection for the next cycle. If the slope is less than or equal to zero, then there is no evidence of VDG. If the slope is only slightly positive, then engineering judgment should be used to determine if VDG needs to be included in the analyses. Engineering judgment decisions should consider the results of the previous POB and leak rate predictions to determine appropriate actions should underpredictions occur, and should consider the affects of potential preventive plugging below the repair limit. In some cases, it may be necessary to perform POB and leak rate sensitivity calculations to determine which growth curve is limiting (voltage dependent or independent), taking into account the affects of potential preventive plugging.

b. For each curve in which VDG is apparent, determine how many growth bins to use and the appropriate breakpoints by performing piecewise regression analysis in accordance with Enclosure 3 of the letter from NEI to the NRC dated June 2, 2004.

c. In some cases, the SG-specific growth curve will show VDG, but the composite growth curve will not show VDG (or vice-versa). In such cases, sensitivity calculations should be performed to determine the limiting growth curve, taking into account the affects of potential preventive plugging.

4. When POPCD is applied, then determine the need for "Delta Volts Adjustment" to determine if a growth rate adjustment is needed to account for potentially increasing growth rates, per the following steps.

   a. Determine the average growth rate in each VDG bin for Cycle n. This average growth rate will be determined on a SG-specific basis if SG-specific growth is being used. If a composite growth rate is being used, the average will be taken across all SGs. When determining the average growth rates, it is acceptable to include the negative growth rates (in lieu of setting the negative growth rates to zero).

   b. Determine the average Cycle n-1 growth rate using the Cycle n breakpoints.

   c. In either case above, if an extreme voltage growth has occurred during either cycle, it should not be included in the determination of the average growth for the cycle for delta volts adjustment purposes since it will significantly influence the average growth for the cycle.

   d. If the average Cycle n growth is greater than the average Cycle n-1 growth on a per VDG bin basis, then the difference should be added to each of the individual growth rates.

   e. If the average Cycle n growth is less than the average Cycle n-1 growth for a VDG bin, then no adjustment is necessary for that voltage bin.

5. When POPCD is applied, then determine if additional adjustments of the growth rates are required.

a. It may be necessary to supplement the SG-specific growth data with relevant data from another SG in either unit to enhance the breakpoint analysis and provide a conservative projection of the POB and leak rate. Examples of adding data to enhance the breakpoint analysis are the following: For the SG 2-4 Cycle 12 analysis, relevant growth data from SG 2-1 Cycle 11 and SG 2-4 Cycle 10 were added; for the SG 1-1 Cycle 12 analysis, relevant growth data from SG 2-4 Cycle 10 was added. If data is added to enhance the breakpoint analysis, the data should also be included in the growth rate distributions.

b. When implementing a greater than 2-volt repair limit, it may be necessary to perform a supplemental growth data assessment by reviewing growth trends from other plants that have operated with repair limits greater than 2 volts. This may be necessary for one or two cycles until there is enough data to develop a DCPP-specific growth rate for these larger indications.

6. If multiple calculations are performed using different growth curves, then the 90-day report should specify which calculation is the "calculation of record."

NRC Questions 9a through 9f:

On page 14 of Enclosure 1 to your submittal, you indicate that the benchmarking results for Unit 1 were provided in a letter dated March 16, 2004 (ML040830711) [PG&E Letter DCL-04-019]. Given the importance of this benchmarking in approving the changes to your predictive methodologies, please address the following questions:

NRC Question 9a:

Discuss whether your 90-day report will include the VDG rate analysis.

PG&E Response:

All future 90-day reports will include an analysis of VDG rates and use the VDG break point determination methods described in Enclosure 3 to the NEI letter to the NRC dated June 2, 2004.

NRC Question 9b:

On page 5 of 42, you indicated that the actual cycle lengths were not used to be consistent with the philosophy of using only the data that was known at the time the original calculations were performed. The staff notes that, in this case, it would have been acceptable to use the actual cycle lengths since it would be expected that if the cycle length were to go beyond what was assumed in the projections, new *calculations would have been performed to justify the longer cycle length. Any future benchmarking should be performed with the actual cycle length.*

PG&E Response:

Future benchmarking will be performed with the actual cycle length.

NRC Question 9c:

For your EOC-11 projections you applied the growth rate distribution from SG 1-1 to all SGs since it was the most limiting. If this were not done, would the projections still have been conservative? If not, discuss whether your procedures will always require the most limiting growth rate distribution to be applied to all SGs.

PG&E Response:

The growth rate distribution from SG 1-1 was applied to all SGs, which is considered too conservative for SGs 1-2, 1-3, and 1-4 with respect to the methods outlined in response to Question 8. Therefore, PG&E has re-performed the EOC-11 benchmarking calculations for SGs 1-2, 1-3, and 1-4 using the outlined methods. In accordance with the guidelines outlined in the response to Question 8, the SG-specific and composite growth curves for Cycles 9 and 10 were reviewed. This review showed that the Cycle 10 composite growth curve bounds all of the SG-specific curves for SGs 1-2, 1-3, and 1-4. The Cycle 10 composite growth data did not exhibit signs of VDG. Therefore, a single growth curve was used for the updated calculations. In accordance with the delta-volts strategy described in the response to Question 8, a comparison of the average growth rates between Cycles 9 and 10 was performed. This comparison showed that there was an average increase in the growth rate of 0.041 volts per EFPY. Therefore, the growth rates from Cycle 10 were all increased by 0.041 volts per EFPY for these analyses. The growth distributions used for SG 1-1 are the same as used in the previous analyses. In accordance with the response to Question 9b, these new calculations used the actual cycle length of 1.41 EFPY. Table 1 below shows the results of these calculations. The projected burst probabilities and leak rates adequately predict the as-found values although all values are small. The projections bound the as-found steam line break (SLB) leak rates for all four SGs and bound the burst probabilities for three of the four SGs with negligible differences (less than 3E-05) for the fourth SG (SG 1-2). In order to investigate the slight underprediction in SG 1-2, an analysis was performed to determine if SG 1-2 was experiencing voltage dependent growth. This analysis showed that SG 1-2 was not experiencing voltage dependent growth prior to Cycle 11. In order to ensure that the limiting growth curve was used for the SG 1-2 EOC-11 projection, another POB calculation was performed using the SG-specific growth rate from SG 1-2 Cycle 10 (non-VDG). As expected, this calculation resulted in a lower projected POB (3.64E-05) than the 5.34E-05 POB calculated using the composite Cycle 10 curve (non-VDG).

Table 1
Unit 1 End-of-Cycle 11 Benchmarking Using New Growth Guidelines

Outage	SG	POPCD	Growth	Breakpoint	Projected		As-Found	
					POB	Leak Rate	POB	Leak Rate
EOC-11	SG 1-1	Industry	SG11 Cycle 10 VDG	0.62v	9.51E-05	0.232	8.82E-05	0.167
	SG 1-2		Composite Cycle 10 Independent	NA	5.34E-05	0.160	8.14E-05	0.139
	SG 1-3				7.91E-05	0.143	3.89E-05	0.088
	SG 1-4				2.37E-05	0.053	2.37E-05	0.033

<u>NRC Question 9d:</u>

On page 6 of 42, you provide an assessment of the underprediction of the number of indications for Cycle 11. In this assessment, you compared the projected and actual results and then increased the BOC distribution based on the differences. The basis and/or relevancy of this adjustment is not clear to the staff. For example, by approaching this assessment in this fashion, it appears that the growth rate distribution was applied twice to the indications (once based on adjusting the BOC indications based on the differences in the projected and actual distributions and then again in the calculation of the POB and leakage). In addition, it appears that the difference in the number of indications would have been further increased by POPCD. Therefore, it is understandable that the subsequent projections were very conservative. In addition, since such information would normally not be available at the time of the original projections, it is not clear how useful this assessment is.

The purpose of the assessment of the underprediction of the number of indications is to ensure any increases in the number of indications (over and above those introduced through application of POPCD) are accounted for. Given that the rate of initiation of "new indications" may increase with time, it may be more useful to look at how many indications were underpredicted as a function of cycle and then increase the BOC distribution appropriately (i.e., after application of POPCD) to account for these underpredicted indications. With respect to the voltages to assign to these indications, a methodology should be developed. Given that most of these indications are small, it may be appropriate to introduce them as very small voltage (0.1 volt) indications. For example, suppose the number of indications at EOC-2 was underpredicted by 50 indications. Further suppose using the same methodology, the number of indications for EOC-3 was underpredicted by 100 indications. Given the trend, it may be appropriate to increase the number of indications in the BOC distribution for the EOC-4 projections by 150 to 200 indications. This adjustment should be made after applying the POPCD so the increase in the number of indications is not further increased by a POPCD adjustment.

The staff recognizes that when the POB and leakage estimates are far from the limits, that the consequences of these underpredictions are typically inconsequential from a safety perspective (i.e., the POB and leakage limits would not be exceeded); however, when the estimates are near the limits this will not be the case. In other words, the purpose of this assessment is to promptly identify a non-conservative methodology and then to take appropriate corrective action before the safety limits are approached/exceeded.

Please reassess the underpredictions in the number of indications for Cycle 11 given the observations above.

PG&E Response:

The EOC-11 projections provided in PG&E Letter DCL-04-019, "DCPP Unit 1 Voltage-Based Repair Criteria Benchmarking and EOC-12 Projections," dated March 16, 2004, used POPCD based on data from other plants in addition to DCPP. This industry POPCD curve was used because DCPP did not meet the requirements at that time for using a site-specific POPCD correlation. The industry POPCD curve has a higher POD at voltages below about 1 volt. Since most of the indications detected are less than 1 volt, using the industry POPCD underpredicts the total number of indications.

In order to show that the underprediction is due to the use of the industry POPCD, the calculations for all four SGs were performed again using the DCPP-specific POPCD. The POPCD used in these new EOC-11 projections are shown in Table 3-4 of PG&E Letter DCL-04-019 dated March 16, 2004. Tables 2 and 3 below provide a comparison of the number and sizes of the indications projected to the number of indications detected at EOC-11. These tables also show the POB and leak rate results. As shown in these tables, the number of indications was significantly underpredicted when using the industry POPCD curve. When using the DCPP-specific POPCD curve, however, the total number of projected indications was either overpredicted or was within 15 percent and within 150 indications of the total number of as-found indications for all 4 SGs.

Table 2
EOC-11 Voltage Comparison for SG 1-1 and SG 1-2

Voltage Category/ Result	SG 1-1			SG 1-2		
	Projected		As-Found	Projected		As-Found
	Ind POPCD	DCPP POPCD		Ind POPCD	DCPP POPCD	
<=1V	184.23	281.80	372	173.17	252.86	296
>1V	81.40	93.31	48	73.90	84.77	42
>2V	8.98	9.34	4	3.35	3.71	5
>3V	0.46	0.42	1	0.06	0.05	0
Total	265.63	375.12	420	247.07	337.63	338
Probability of Burst	9.51E-05	1.13E-04	8.82E-05	5.34E-05	6.05E-05	8.14E-05
Leak Rate (gpm)	0.232	0.264	0.167	0.160	0.185	0.139

Table 3
EOC-11 Voltage Comparison for SG 1-3 and SG 1-4

Voltage Category/ Result	SG 1-3			SG 1-4		
	Projected		As-Found	Projected		As-Found
	Ind POPCD	DCPP POPCD		Ind POPCD	DCPP POPCD	
<=1V	76.81	115.55	122	55.11	94.87	95
>1V	54.76	59.13	36	24.82	28.29	11
>2V	5.42	5.49	1	1.82	1.92	1
>3V	0.16	0.16	0	0.04	0.04	0
Total	131.57	174.68	158	79.93	123.16	106
Probability of Burst	7.91E-05	6.98E-05	3.89E-05	2.37E-05	4.62E-05	2.37E-05
Leak Rate (gpm)	0.143	0.155	0.088	0.053	0.063	0.033

Since the EOC-11 underpredictions of the number of indications are understood to be a result of using the industry POPCD, no adjustments to the BOC distributions used for the EOC-12 projections will be made since the EOC-12 projections used the DCPP-specific POPCD. However, in the event that the number of indications is underpredicted in a future outage, the following steps, similar to that recommended in the question, are recommended to be taken to determine if an adjustment is needed and to determine the amount of the adjustment. This process will only be applied in cases where POPCD is being applied. These steps are recommended as guidelines based on PG&E's current understanding of the potential for underpredictions of low voltage indications at DCPP Units 1 and 2. If future inspection results provide additional information that could alter these guidelines, PG&E would provide recommended changes to the guidelines and basis for the changes in the subsequent 90 day report.

1. Determine the total number of projected indications from the previous operational assessment and the number of as-found indications for the recently completed inspection. It may be necessary to recalculate the previous operational assessment values if there have been changes in the procedures that would affect the number of indications, i.e., going from 0.6 POD to POPCD.

2. Compare the number of as-found indications to the number of projected indications. If the number of indications is underpredicted by more than 15 percent or more than 150 indications, then an adjustment to the BOC distribution should be made in order to more conservatively predict the number of indications at the end of the next cycle. If the number of projected indications is overpredicted or is within 15 percent and within 150 indications of the number of as-found indications, then no adjustment is necessary.

3. The adjustment will be made by artificially inflating the number of indications in the 0.1 volt and 0.2 volt bins. The amount of this adjustment will be determined as follows.

    a. Use a two-parameter Weibull fit to estimate the number of indications at the next scheduled inspection.

        i. Determine the cumulative number of intersections with distorted outside diameter signal and AONDB indications over the last several inspections.

        ii. Using a total available population of 23716 intersections (seven hot leg supports x 3388 tubes), determine the shape and scale parameters for a two-parameter Weibull distribution. If cold leg ODSCC is confirmed by Plus Point coil, then the population should be increased to include the cold leg intersections down to the lowest cold leg support plate in which ODSCC was confirmed.

        iii. Using the shape and scale parameters from the Step 3.a.ii, calculate the estimated cumulative number of indications at the time of the next scheduled inspection.

        iv. Calculate the number of additional new indications expected by subtracting the number of indications detected to date from the estimated number of cumulative indications from Step 3.a.iii.

        v. Calculate the number of indications expected at the next scheduled inspection by adding the number of new indications from Step 3.a.iv to the number of indications returned to service.

b. Use the mean POPCD curve to determine the number of indications that the Monte Carlo analysis will project for the next scheduled inspection. In this section and the following sections, the terms BOC and EOC refer to the beginning and end of the upcoming cycle for which the adjustment is made.

   i. For each voltage bin, determine the mean POPCD value at the midpoint of that particular voltage bin.

   ii. Calculate the number of indications at the beginning of the next cycle for each voltage bin via the following formula

$$N_{boc} = \frac{N_{det}}{POD} - N_{rep}$$

   where: N_{boc} = number of indications at the beginning of the next cycle,
   N_{det} = number of indications detected,
   N_{rep} = number of indications repaired, and
   POD = probability of detection at the midpoint of the voltage bin

   iii. Add the BOC number of indications for all voltage bins together to obtain a total number of BOC indications. This will be the approximate number of indications projected by the Monte Carlo analyses.

c. Calculate the amount of the required adjustment to the number of indications at the end of the next cycle.

   i. Calculate the amount of the underprediction at the end of the previous cycle, i.e., $N_{as\text{-}found} - N_{projected}$. See Step 2.

   ii. Calculate the difference in the projections at the end of the next cycle from Steps 3.a.v and 3.b.iii., i.e., number projected from Weibull analysis minus number projected using the POPCD.

   iii. The amount of the adjustment should be the maximum of the values from Steps 3.c.i and 3.c.ii.

4. The adjustment from the previous step (3.c.iii) needs to be made to the number of projected indications at the end of the next cycle, i.e., after application of the POD. Therefore, the adjustment to the BOC input file needs to be reduced so that, after application of the POD, the desired

increase in the number of EOC indications is obtained. This adjustment can be made as follows:

a. Since the reason for this adjustment is to account for newly-initiated flaws, the adjustment will be made by artificially adding flaws to the two smallest voltage bins (0.1 volt and 0.2 volt). The adjustment should be split evenly between these two voltage bins.

b. Since the current Monte Carlo codes don't allow artificial adjustments to the number of indications after application of the POD, the desired amount of the adjustment needs to be multiplied by the POD at the midpoint of each voltage bin to obtain an adjustment that can be made to the BOC distribution.

c. To better explain this method, consider the following example. Assume that a total of 200 indications needs to be added to the EOC voltage distribution. Therefore, the adjustment after application of the POD will be 100 indications in each of the 0.1-volt and 0.2-volt bins. Further assume that the POD at 0.05 volt is 0.1 and at 0.15 volt is 0.2 (remember that these voltages are the midpoints of their respective bins). The adjustment to the 0.1-volt bin would, therefore, be 10 indications (100 x 0.1). Likewise, the adjustment to the 0.2-volt bin would be 20 indications.

<u>NRC Question 9e:</u>

A number of different cases were provided for your EOC-12 projections. Please clarify which case provides your analysis of record and describe how you plan on determining your analysis of record in future outages (i.e., what method will be used to determine the EOC probability of burst and leakage estimates for comparison against the regulatory limits).

<u>PG&E Response:</u>

Case 3 of Table 3-5 on page 28 of the enclosure to PG&E Letter DCL-04-019 dated March 16, 2004, provided the EOC-12 POPCD analysis of record. However, these calculations did not include the extreme growth modeling because the model was not yet defined at the time of the submittal. Therefore, as committed in PG&E Letter DCL-04-019, PG&E has reperformed the EOC-12 benchmarking calculations using the extreme growth modeling. These new calculations also followed the growth guidelines outlined in the response to Question 8. Based on a review of the growth rates for Cycles 10 and 11, it was determined that the Cycle 11 composite growth curve should be used for SGs 1-2, 1-3, and 1-4. The growth curve for SG 1-1 remains unchanged from the previous Case 3 calculation. As discussed in the response to Question 9d, no adjustment was necessary to the BOC input file for the Unit 1 EOC-12 projections.

Table 4 of this letter provides the results of the EOC-12 calculations both with and without the extreme growth modeling. The extreme growth methods provide for statistically based likelihoods of occurrences for large growth values. The likelihood of occurrence increases with the number of indications left in service for each SG. For SGs 1-1 and 1-2, which have relatively large numbers of indications compared to SGs 1-3 and 1-4, the extreme growth methods increase the probability of burst by 1.4E-4 to 1.7E-4, while the increase is less than 1.0E-4 for SGs 1-3 and 1-4 with fewer indications. The increases in the SLB leak rates are negligible due to less sensitivity to a few large voltage indications and the fact that the leak rates are evaluated at the 95 percent probability level.

The calculation results in Table 4 of this letter, which used the extreme growth modeling, are the POPCD analysis of record for Unit 1 EOC-12. For future outages, PG&E's analysis of record will apply POPCD methods and extreme growth methods, contingent on NRC multi-cycle approval of POPCD. The methods will also include the growth rate guidelines given in the response to Question 8 and the BOC adjustment guidelines described in the response to Question 9d.

In response to this request for additional information, PG&E also reviewed the current EOC-12 projections for Unit 2 in accordance with the growth guidelines and BOC adjustment guidelines outlined earlier. The benchmarking calculations provided in PG&E Letter DCL-03-121, dated September 30, 2003, used the supplemented SG 2-4 Cycle 11 growth curve for all four SGs. In accordance with the new growth guidelines, the composite Cycle 11 curve should be used for SGs 2-2 and 2-3. SG 2-1 should use the Cycle 11 SG-specific curve. The growth curve used for SG 2-4 remains unchanged. Therefore, the EOC-12 projections were recalculated using both the new growth guidelines and the extreme growth modeling. The results of these calculations are provided in Table 5 below. The statistical treatment in the extreme growth modeling of the large growth value in SG 2-4 leads to a reduction in burst probability and leak rates compared to inclusion of the large growth directly in the growth distribution. This is consistent with expectations for the extreme growth methods since the likelihood of an extreme growth value is a random event that is not expected to occur with a high probability in successive cycles.

A review of the number of indications projected at EOC-11 versus the as-found population at EOC-11 was performed for Unit 2. If the DCPP-specific POPCD correlation is used in the EOC-11 projections, the number of projected indications is within 15 percent and within 150 indications of the number of as-found indications in each SG. Therefore, no adjustment to the number of BOC indications was necessary for the new EOC-12 calculations for Unit 2.

Table 4
Unit 1 End-of-Cycle 12 Benchmarking Results Using New Growth Guidelines
(With and Without Extreme Growth)

Outage	SG	POPCD	Extreme Growth	Growth Data Used	Breakpoint(s)	Projected			As-Found		
						No. of Inds	POB	Leak Rate	No. of Inds	POB	Leak Rate
EOC-12	SG 1-1	DCPP Through 2R11 (Five Inspections)	Yes	SG11/SG24 Composite	0.49v/1.18v	903	1.37E-03	1.03	653	1.43E-03	0.96
	SG 1-2			Composite C11 VDG	0.50v	796	2.96E-04	0.41	439	2.14E-04	0.31
	SG 1-3					303	2.04E-04	0.25	223	7.45E-05	0.16
	SG 1-4					261	9.73E-05	0.11	172	1.41E-04	0.15
	SG 1-1	DCPP Through 2R11 (Five Inspections)	No	SG11/SG24 Composite	0.49v/1.18v	903	1.20E-03	1.02	653	1.43E-03	0.96
	SG 1-2			Composite C11 VDG	0.50v	796	1.55E-04	0.405	439	2.14E-04	0.31
	SG 1-3					303	1.20E-04	0.245	223	7.45E-05	0.16
	SG 1-4					261	4.86E-05	0.105	172	1.41E-04	0.15

Table 5
Unit 2 End-of-Cycle 12 Projections Using New Growth Guidelines and Extreme Growth

Outage	SG	POPCD	Extreme Growth	Growth Data Used[4]	Breakpoint(s)	No. of Inds	POB	Leak Rate
EOC-12	SG 2-1	DCPP Through 2R11 (Five Inspections)	Yes	SG 2-1 Cycle 11	1.06v	912	1.05E-03	0.68
	SG 2-2		Yes	Composite Cycle 11	0.59v/1.66v	691	5.45E-04	0.60
	SG 2-3		Yes	Composite Cycle 11	0.59v/1.66v	689	5.07E-04	0.49
	SG 2-4		Yes	SG 2-4 Cycle 11 w/ Data from 2-4 Cycle 10[3]	0.59v/1.66v	1670	3.43E-03	3.08
	SG 2-4		No[1]	SG 2-4 Cycle 11 w/ Data from 2-4 Cycle 10[3]	0.59v/1.66v	1670	6.62E-03[1,2]	3.19[1,2]

(1) The projections for SG 2-4 without the extreme growth modeling include the large growth from SG 2-4 Cycle 11 in the regular growth distribution. Therefore, the POB and leak rate results are higher than the results, which use the extreme growth modeling.
(2) The results for the case without the extreme growth modeling, are slightly higher than the previous results provided as the "calculation of record." The previous results were a POB of 5.94E-03 and a leak rate of 2.86 gpm and were provided in PG&E Letter DCL-03-121 dated September 30, 2003. The new results are slightly higher due to implementation of the new growth guidelines as discussed in response to NRC Question 9e.
(3) The growth curves used for the SG 2-4 calculations included the data from SG 2-4 Cycle 11 plus an additional 30 data points from SG 2-4 Cycle 10. The Cycle 10 data included those indications, which were greater than 1.17 volts at the beginning of Cycle 10. Voltage of 1.17 was selected since this was the upper breakpoint for the Cycle 10 VDG analysis. This satisfies the requirement of Step 5.a, in response to NRC Question 8, which states that the data that is used for the breakpoint analysis should also be used in the growth rate distributions. These growth curves reflect slight revisions to the curves used in the "calculation of record" in Table 11-2 in PG&E Letter DCL-03-121 dated September 30, 2003, which had used all >1.66 volt bin growth rate data points from SG 2-4 Cycle 10 (3 data points), plus the largest growth rate data point from SG 2-1 Cycle 11. The revised curves used in Table 5 above were determined to be more conservative than the DCL-03-121 curves based on sensitivity calculations.
(4) The delta volts adjustment for all of the SG 2-2, 2-3 and 2-4 calculations (with and without the extreme growth modeling) does not include the large growth from SG 2-4 Cycle 11 R44C45 per Step 4 in the guidelines provided in the response to NRC Question 8.

NRC Question 9f:

In the "delta-volts" approach described in your submittal, please clarify whether you plan on adjusting the growth rate distributions downward if the growth rate decreases from one cycle to the next or whether you plan on using the most conservative growth rate distribution.

PG&E Response:

PG&E does not plan to implement the delta volts methods (i.e., adjust the growth rate distributions downward) if the growth rate decreases from one cycle to the next. PG&E will apply the methods described in response to Question 8 for determining conservative growth rate distributions.

NRC Question 10:

On page 14 of Enclosure 1 to your submittal, you indicate the POPCD model is in good agreement with the probability of detection model developed by Argonne National Lab (ANL) and an EPRI probability of detection model. Please provide a comparison of the ANL model and the POPCD model. This comparison should include fitting the data by the same statistical method (e.g., log-logistic).

PG&E Response:

As described in Section 7.3 and Figures 7 and 8 of Enclosure 1 to the NEI letter to the NRC dated June 2, 2004, the ANL model and the POPCD models are compared using loglogistic fits to the data. As noted in Section 7.3, "The comparisons show that the Industry POPCD results are significantly higher than the ANL results and both are near unity above 5 volts. The ANL data are based exclusively on laboratory specimens, which may have morphology differences from pulled tubes that lead to the differences in the PODs. The trends of POD with increasing voltage are essentially the same for all distributions."

Figure 6 of Enclosure 1 to the NEI letter to the NRC dated June 2, 2004, shows the ANL test results for fractional POD as a function of voltage and the logistic POD fit to the data. The ANL POD shows a steep curve increasing from about 0.25 at 0.5 volts to about 0.99 at 1.5 volts although the test results show a POD of about 0.9 in the 1.5 to 2 volts range. This POD is lower than the industry and DCPP POPCD results at 0.5 volts but higher at 1.5 volts where the POPCD results show a POD of about 0.92 to 0.93. The Generalized Linear Model (GLM) methods applied for POPCD analyses would not reproduce the ANL POD curve in Figure 6 of Enclosure 1 to the NEI letter to the NRC dated June 2, 2004, from the test data shown in Figure 6. Therefore, the ANL test results were reanalyzed using the POPCD GLM methods and a loglogistic fit to compare the ANL PODs with the POPCD results.

Section 2.1.4.2 of NUREG/CR-6791, ANL-02/07, "Eddy Current Reliability Results from the Steam Generator Mock-up Analysis Round-Robin," dated November 2002, reports that the specimens for the ANL test sections were cracked using a solution of sodium tetrathionate at room temperature and atmospheric pressure. Industry experience with this cracking environment indicates a strong propensity to corrosion patches that are frequently more typical of IGA than dominantly axial ODSCC. Bobbin or RPC volts versus depth trends for this type of sample differ significantly from the ARC pulled tube database. For these reasons, this method of sample preparation was not considered acceptable for the ODSCC ARC when laboratory samples were prepared in the 1993 time frame, and samples prepared by sodium tetrathionate do not meet acceptance criteria for use in current EPRI programs for development of POD and sizing correlations.

Based on the above considerations, the ANL POD as a function of bobbin voltage is not considered adequate for ARC applications. The ANL PODs provide general trends but the nonprototypical specimens preclude use on an absolute voltage basis.

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5.6 Reporting Requirements (continued)

5.6.10 Steam Generator (SG) Tube Inspection Report

5) Performance evaluation of the operational assessment methodology for predicting flaw distributions as a function of flaw size.

6) Evaluation results of number and size of previously reported versus new PWSCC indications found in the inspection, and the potential need to account for new indications in the operational assessment burst evaluation.

7) Identification of mixed mode (axial PWSCC and circumferential) indications found in the inspection and an evaluation of the mixed mode indications for potential impact on the axial indication burst pressures or leakage.

8) Any corrective actions found necessary in the event that condition monitoring requirements are not met.

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MARKED-UP TECHNICAL SPECIFICATION PAGE

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i. For implementation of the probability of prior cycle detection (POPCD) method, for the voltage-based repair criteria at tube support plate intersections, if the end-of-cycle conditional main steamline break burst probability, the projected main steamline break leak rate, or the number of indications are underpredicted by the previous cycle operational assessment, the following shall be reported to the Commission pursuant to 10 CFR 50.4 within 90 days following return to service of the steam generators:

1) The assessment of the probable causes for the underpredictions, proposed corrective actions, and any recommended changes to probability of detection or growth methodology indicated by potential methods assessments.

2) An assessment of the potential need to revise the alternate repair criteria analysis methods if: the burst probability is underpredicted by more than 0.001 (i.e., 10% of the reporting threshold) or an order of magnitude; or the leak rate is underpredicted by more than 0.5 gpm or an order of magnitude.

3) An assessment of the potential need to increase the number of predicted low voltage indications at the beginning of cycle if the total number of as-found indications in any SG are underestimated by greater than 15% or by greater than 150 indications.

Enclosure 3
PG&E letter DCL-04-104

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5.6 Reporting Requirements (continued)

5.6.10 Steam Generator (SG) Tube Inspection Report

5) Performance evaluation of the operational assessment methodology for predicting flaw distributions as a function of flaw size.

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7) Identification of mixed mode (axial PWSCC and circumferential) indications found in the inspection and an evaluation of the mixed mode indications for potential impact on the axial indication burst pressures or leakage.

8) Any corrective actions found necessary in the event that condition monitoring requirements are not met.

i. For implementation of the probability of prior cycle detection (POPCD) method, for the voltage-based repair criteria at tube support plate intersections, if the end-of-cycle conditional main steamline break burst probability, the projected main steamline break leak rate, or the number of indications are underpredicted by the previous cycle operational assessment, the following shall be reported to the Commission pursuant to 10 CFR 50.4 within 90 days following return to service of the steam generators:

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3) An assessment of the potential need to increase the number of predicted low voltage indications at the beginning of cycle if the total number of as-found indications in any SG are underestimated by greater than 15% or by greater than 150 indications.