Pacific Gas and Electric Company

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January 31, 2003

PG&E Letter DCL-03-008

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 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 NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

Dear Commissioners and Staff:

By letter dated March 18, 2002, the U.S. Nuclear Regulatory Commission issued NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." Pacific Gas and Electric Company (PG&E) provided the requested 60-day response in PG&E letter DCL 02-063, "60-Day Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"."

The staff evaluated the 60-day response and as a result has asked for additional information. PG&E's response to these additional questions, as it pertains to the reactor coolant pressure boundary other than the reactor pressure vessel head, are contained in Enclosure 1 of this letter. Enclosure 2 lists the locations in the reactor coolant pressure boundary where Alloy 600 and Alloy 82/182 welds exist.

If you have any questions regarding this response, please contact Stan Ketelsen at (805) 545-4720.

Sincerely,

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

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mjr
Enclosures
cc:/enc Edgar Bailey, DHS
Ellis W. Merschoff
David L. Proulx
Girija S. Shukla
Diablo Distribution

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT

David H. Oatley, of lawful age, first being duly sworn upon oath states that he is Vice President and General Manager - Diablo Canyon of Pacific Gas and Electric Company; that he has executed this response to the request for additional information on NRC Bulletin 2002-01 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.

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

Subscribed and sworn to before me this 31st day of January 2003.
County of San Luis Obispo
State of California

Notary Public

SANDRA L. RECTOR
Commission # 1339380
Notary Public - California
San Luis Obispo County
My Comm. Expires Jan 12, 2006

PG&E Response to NRC Request for Additional Information Regarding NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity."

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The staff evaluated the 60-day response and as a result has asked for additional information. PG&E's response to these additional questions, as it pertains to the reactor coolant pressure boundary (RCPB) other than the reactor pressure vessel head, are contained in this enclosure. Enclosure 2 lists the locations in the RCPB where Alloy 600 and Alloy 82/182 welds exist.

Answers to the questions in the request for additional information (RAI) regarding the Class I RCPB other than the reactor pressure vessel head are provided below.

Request No.1

Provide detailed information on, and the technical basis for, the inspection techniques, scope, extent of coverage, and frequency of inspections, personnel qualifications, and degree of insulation removal for examination of Alloy 600 pressure boundary material and dissimilar metal Alloy 82/182 welds and connections in the reactor coolant pressure boundary (RCPB). Include specific discussion of inspection of locations where reactor coolant leaks have the potential to come in contact with and degrade the subject material (e.g., reactor pressure vessel (RPV) bottom head).

PG&E Response to Request No.1

PG&E's policy is to minimize boric acid induced corrosion by applying an administrative program that provides for: (1) early detection of boric acid leaks; (2) thorough inspection of the areas surrounding identified boric acid leakage; (3) proper evaluation of areas where leakage has occurred; and (4) prompt action to mitigate the leak, perform repairs, and avoid future damage.

PG&E's boric acid leakage inspection program is implemented by the following procedures: AD4.ID2, "Plant Leakage Evaluation;" Surveillance Test Procedure (STP) R-8A, "Reactor Coolant System Leakage Test;" STP R-8C, "Containment Walkdown for Evidence of Boric Acid Leakage;" and Inservice Inspection (ISI) X-CRDM, "Reactor Vessel CRDM Inspection."

Procedures AD4.ID2 and STP R-8C implement commitments made in response to NRC Generic Letter (GL) 88-05.

AD4.ID2 is an administrative procedure that provides a standardized method for reporting and tracking leakage from plant systems. AD4.ID2 provides guidance on what actions must be taken if leakage is discovered. In addition, AD4.ID2 contains instructions on what to do if boric acid is found, including determining the source of a leak, preserving evidence, evaluating for wastage, and long-term corrective actions to control boric acid and prevent recurrence of problems. AD4.ID2 requires that any individual who discovers a leaking component identify and document the problem in accordance with the Diablo Canyon Power Plant (DCPP) problem identification and resolution procedure.

STP R-8A is the system leakage test for the Class 1 pressure boundary required by ASME Code, Section XI. The Code requires, as a minimum, visual inspection of all mechanical joints that have been opened and closed since the last performance of the test. All accessible Class 1 components within the RCPB are required to be inspected during the 10 year system pressure/hydrostatic test. STP R-8A is performed following the normal heat up and pressurization of the primary system at normal operating pressure and temperature following refueling outages. The practice at DCPP has been to inspect all accessible portions of the RCPB. This inspection includes the RPV head with the insulation installed. Any leaks of boric acid observed during the course of the walkdown, whether or not from the test boundary, are recorded, and the source and amount of leakage is determined. An evaluation is performed to determine the impact of that leakage on any Class I carbon steel components or supports that may be subject to corrosion.

STP R-8C is the containment walkdown procedure performed during each refueling outage when the reactor coolant system (RCS) is depressurized. It is used to identify boric acid leakage from any source inside containment to minimize potential boric acid corrosion of Class 1 low alloy/carbon steel RCPB components, including supports. It is also used to perform examinations of the control rod drive mechanism (CRDM) area above the RPV head insulation. STP R-8C is also used during a forced outage.

ISI X-CRDM is the procedure that provides guidelines for inspection of the CRDM canopy seal welds and CRDM head penetration tubes above the insulation for evidence of through-wall leakage, including visual and remote visual examination. ISI X-CRDM also serves to detect leakage from other causes and sources in proximity to the reactor vessel head. ISI X-CRDM includes direction for performance of RPV bare head penetration visual inspections required to address NRC Bulletin 2001-01 and to inspect the RPV head for boric acid deposits and degradation in response to NRC Bulletin 2002-01. ISI X-CRDM requires that all boric acid deposits be investigated, and any adverse conditions be identified, evaluated, and documented in accordance with DCPP's problem identification and resolution procedure.

Inspection Techniques

Visual inspections at DCPP and at other stations have been effective in detecting small boric acid leaks. Active, wet boric acid leaks will leave traces as the liquid flows down vertical inclines by gravity. These traces are used in detecting and tracing boric acid leaks to their source. Even for extremely small leakage rates, boric acid leaks leave a visible deposit. Boric Acid Corrosion Guidebook, Revision 1, November 2000, Section 6.5 states "Visual inspections are one of the most effective ways of finding small boric acid leaks that may escape detection by other means." Materials Reliability Program (MRP) -75, Attachment C, Figure C-1 plots the volume of boric acid versus leak rate, using a cycle average boron concentration. The volume of dry boric acid crystals for a leak on the order of 1E-3 gpm would be 500 cubic inches, which is readily detectible by visual inspection. Leaks of uninsulated components are routinely detected with less than 1 cubic inch of boric acid deposits. When implemented properly, visual inspection techniques have historically been adequate to minimize corrosion damage to carbon steel RCPB components.

Scope And Extent of Coverage

Alloy 600 and Alloy 82/182 material locations in the RCPB are listed in Enclosure 2.

Alloy 600 is located in only a few locations in the DCPP Class 1 RCPB: reactor head penetration tubes (including the head vent pipe), the reactor head o-ring leakage detection piping, the bottom mounted instrument nozzles (BMI's), and the steam generator tubes, divider plates, and hot leg bowl drain tubes. The reactor vessel head and vessel lower head areas are included in the STP R-8C inspections.

PG&E has added the general area under the reactor vessel (bottom mounted instrument tube area) to the STP R-8C walkdown. The bottom head of the reactor is visually inspected with the insulation in place. PG&E has not removed lower head insulation to inspect the lower reactor head and nozzles; however, PG&E currently is scheduled to do so in Unit 2 Refueling Outage No. 11 (2R11).

Alloy 82/182 locations in the RCPB, other than the reactor vessel nozzle safe end welds, are inspected during STP R-8C walkdowns. Areas inspected include the pressurizer relief valve and power-operated relief valve (PORV) nozzles and the pressurizer surge line. These areas are inspected with the insulation in place. The Alloy 82/182 welds at the transition from the Alloy 600 head penetration tubes to the stainless steel adapters are visually inspected during the performance of ISI X-CRDM each outage.

Since V.C. Summer experienced a hot leg weld crack of Alloy 82/182 weld material in 2000, DCPP system engineering performs a walkdown of the vessel safe ends. The walkdown ensures that any boric acid buildup is promptly identified, evaluated and corrected. Although DCPP Units 1 and 2 have a different fabrication history than V.C. Summer, the DCPP Unit 1 and 2 vessel to safe end welds are similar. The vessel to loop piping safe ends have an Alloy 82/182 butter and weld material between the carbon steel and the stainless steel.

PG&E considers all RCPB components to have the potential for leakage leading to degradation of the RCPB. Therefore the procedure at DCPP is to inspect the entire RCPB for evidence of leakage. Any evidence of leakage is investigated, evaluated and corrective actions are taken as required.

Frequency of Inspections

STP R-8C is performed at the beginning of each refueling outage and at every Mode 3, 4 or 5 forced shutdown, if STP R-8C has not been performed within 90 days. The frequency is consistent with NRC GL 88-05 and has been effective in detecting small leaks in the RCS pressure boundary.

The greater than 90-day Mode 3, 4, or 5 frequency is consistent with other cold shutdown frequency surveillance tests.

STP R-8A is performed during the normal heat up and pressurization of the primary system. This test is required on a refueling frequency for those components that have been opened and closed since the last test. At each 10th year refueling, a system hydrostatic test at normal operating pressure per Code Case N-498-1 extends this test to the entire Class 1 boundary except as provided in approved relief requests.

Primary system hydrostatic tests at normal operating pressure per Code Case N-416-1 are performed during refueling outages in conjunction with repairs or replacements, as required.

DCPP and industry experience is that active, wet leakage capable of causing component wastage is detectable by boric acid deposits or traces. When implemented properly, the above frequencies of visual inspections have historically been adequate in minimizing corrosion damage to carbon steel RCPB components.

Personnel Qualifications

The ISI Group has the overall responsibility for ensuring effective performance of STP R-8C. VT-2 certified ISI inspectors primarily perform the STP R-8C inspections. In addition to being VT-2 certified, these inspectors are knowledgeable regarding the DCPP primary systems and are experienced in detecting and locating boric acid leakage. Other personnel experienced in detecting and locating boric acid leakage (system engineers, maintenance planners or maintenance craft) have participated in past inspections. However, only VT-2 certified personnel will perform future STP R-8C inspections.

Certified VT-2 inspection personnel conduct ASME Section XI required pressure test walkdowns of the RCPB, such as STP R-8A, individual pressure tests, and ISI X-CRDM inspections. PG&E's VT-2 certifications are per ASME requirements. Other than ASME VT-2 requirements, there is no specific qualification basis.

The combination of training/qualifications (VT-2) and experience of the PG&E inspectors has enabled them to find many small leaks during the STP R-8C walkdowns, prior to the leaks causing significant component wastage that could affect its function. The VT-2 certification, the extensive experience base of in-field boric acid detection, and knowledge of industry operating experience ensures that the visual inspections are effective in detecting small traces of boric acid.

Degree of insulation removal

Insulation is not removed during the STP R-8C boric acid inspections, unless required to locate the source of a boric acid leak or to inspect for potential degradation caused by a boric acid leak.

ASME Section XI required pressure tests do not require insulation removal except for carbon steel fastener locations per Code Case N-533, approved for use at DCPP.

Industry experience has demonstrated that visual examinations are capable of detecting very small leaks in systems containing boric acid. Even for extremely small leakage rates, boric acid leaks leave a visible deposit. Active, wet boric acid leaks will leave traces as the liquid flows down by gravity. These traces are utilized in detecting and tracing boric acid leaks to their sources. MRP-75, Attachment figure C-1 plots the volume of boric acid versus leak rate, using a cycle average boron concentration. The volume of dry boric acid crystals for a leak on the order of 1E-3 gpm would be 500 cubic inches in one fuel cycle.

DCPP and industry experience support the conclusion that active, wet leakage capable of causing component wastage will be detectable by boric acid deposits or traces without insulation removal. The V.C. Summer hot leg weld crack was detected by tracing the boric acid deposits back to the source.

Potential locations where leaks have the potential to contact and degrade RCPB components

PG&E considers all boric acid systems in containment to have the potential to cause degradation of the RCPB. Therefore, the procedure at DCPP is to inspect the entire RCPB for evidence of leakage. Any evidence of leakage is investigated, evaluated and corrective actions are taken as required.

<u>Request No.2</u>

Provide the technical basis for determining whether or not insulation is removed to examine all locations where conditions exist that could cause high concentrations of boric acid on pressure boundary surfaces or locations that are susceptible to primary water stress corrosion cracking (Alloy 600 base metal and dissimilar metal Alloy 82/182 welds). Identify the type of insulation for each component examined, as well as any limitations to removal of insulation. Also include in your response actions involving removal of insulation required by your procedures to identify the source of leakage when relevant conditions (e.g., rust stains, boric acid stains, or boric acid deposits) are found.

<u>PG&E Response to Request No.2</u>

Industry experience has shown that leakage that can cause wastage is detectable during a visual inspection with the insulation installed. Small leakage rates create a volume of boric acid large enough to be detected by visual inspections. Therefore insulation is not removed unless there is an indication of leakage. When leakage is identified, sufficient insulation is removed to trace the source of leakage and to ensure that any consequential damage to carbon or low alloy steel is inspected, evaluated and corrected.

The inspectors look for traces of boric acid on the insulation. When found, they identify the source, or request insulation to be removed to determine the source. The following instruction is provided in plant administrative procedure AD4.ID2, "Plant Leakage Evaluation":

> "Boric acid leaks can travel down sloped pipes or through insulation. When there is doubt as to a leak's origin, the evidence (i.e., accumulation of boric acid crystals) must be preserved until an evaluation has been performed to estimate the source, pathway, amount, any low alloy/carbon steel components that may be affected, and suitability of the component for continued service. This does not preclude the immediate installation of drip bags, diverting curbs, or splash pans to mitigate the leak's impact on the surrounding environment. Prompt use of these measures is necessary to maintain plant cleanliness, personnel safety, and equipment reliability."

The reactor vessel insulation is all stainless steel mirror insulation. The Unit 1 reactor vessel lower head insulation is mirror insulation that conforms to the curvature of the lower head. In order to perform a direct visual inspection, a significant number of work hours would be required in a radiation area for insulation removal and reinstallation. The Unit 2 reactor vessel lower head insulation is mirror insulation which is cylindrical with a flat bottom. The Unit 2 insulation provides panels which are designed to be opened for inspection, and provides for more direct access for visual inspections.

The steam generator bowl area insulation is stainless steel mirror insulation that is removed each outage for steam generator inspections.

The pressurizer insulation is a mix of mirror and pad type insulation. The pressurizer surge line insulation is stainless steel mirror insulation. The pressurizer heater area adjacent to the surge line has pad type insulation. The pressurizer safety valve and PORV connections are insulated with mirror insulation. The pressurizer spray line insulation is stainless steel mirror insulation.

Most of the main reactor coolant loop piping insulation is stainless steel mirror insulation, with some pad type insulation, especially where small piping or attachments are connected to the loop piping.

Use of carbon steel is limited in the RCPB. The reactor vessel, pressurizer vessel, and steam generators are constructed of carbon steel with stainless steel clad. The reactor vessel closure studs and the reactor coolant pump main flange bolting are carbon steel. There are a few other mechanical joints with carbon steel fasteners. Structural elements are painted for corrosion protection, and are generally at lower temperature, further reducing corrosion rates.

PG&E believes that the RCPB walkdowns without insulation removal are sufficient to identify active boric acid leakage prior to significant degradation occurring. Once a leak is identified, insulation is removed as necessary to identify the source of the leakage and to ensure that any consequential damage to carbon or low alloy steel is inspected, evaluated and corrected. Leakage sufficient to cause significant degradation would leave substantial boric acid deposits or traces, which have historically been detectable without insulation removal.

Request No.3

Describe the technical basis for the extent and frequency of walkdowns and the method for evaluating the potential for leakage in inaccessible areas. In addition, describe the degree of inaccessibility, and identify any leakage detection systems that are being used to detect potential leakage from components in inaccessible areas.

PG&E Response to Request No.3

During power operation, the RCPB is considered inaccessible due to radiation dose considerations. The following detection methods, required by technical specifications (TS), are used to detect leakage.

DCPP performs an inventory balance at least once per 72 hours as required by Surveillance Requirement (SR) 3.4.13.1 when the plant is in Mode 4 or above. Typically these tests are performed once per day.

DCPP also has the following TS 3.4.15 required RCS leakage detection systems, each capable of detecting an RCS pressure boundary leak of 1 gpm:

- Containment radiation monitors
- Containment sump inventory checks
- Containment fan cooler unit drain collection systems (which can be used if a radiation monitor is out of service, or as a diagnostic method if a leak is suspected)

No location specific monitoring systems are in use at DCPP. Industry experience to date is that remote monitoring and detection systems are not capable of reliably detecting the extremely small leak rates experienced in the early stages of head penetration leaks, which visual inspections are capable of detecting.

When the plant is cooled down and depressurized, the entire RCPB is considered to be accessible, with the exception of portions of the RPV sides, which are close to the concrete shield wall structure and cannot be accessed directly for inspection. However, active, wet boric acid leaks will leave traces as the liquid flows down by gravity. These traces are utilized in detecting and tracing boric acid leaks to their source. If any evidence of leakage were found, it would be investigated, evaluated and corrective actions would be taken as required.

The entire RCPB is inspected during STP R-8C walkdowns each refueling outage and during forced outages when STP R-8C has not been performed within 90 days. The area directly under the reactor vessel is inspected for evidence of leakage.

The area where the reactor vessel safe end welds are located requires the removal of a bolted manway cover to enter. This area is inspected during refueling outages.

DCPP and industry experience is that active, wet leakage capable of causing component wastage is detectable by boric acid deposits or traces. Although there is no specific documented basis for the visual inspection frequencies, the above frequencies of visual inspections have historically been adequate in minimizing corrosion damage to carbon steel RCPB components.

Request No.4

Describe the evaluations that would be conducted upon discovery of leakage from mechanical joints (e.g., bolted connections) to demonstrate that continued operation with the observed leakage is acceptable. Also describe the acceptance criteria that was established to make such a determination. Provide the technical basis used to establish the acceptance criteria. In addition,

a. if observed leakage is determined to be acceptable for continued operation, describe what inspection/monitoring actions are taken to trend/evaluate changes in leakage, or

b. if observed leakage is not determined to be acceptable, describe what corrective actions are taken to address the leakage.

PG&E Response to Request No.4

The DCPP program for reporting and evaluating leaks requires a corrective maintenance action request (AR) to be written when a wet or significantly three dimensional boric acid deposit is found, or anytime boric acid crystals are found at an unexpected location (such as a weld). The initiator is responsible for making an initial determination of the source and whether any components are being damaged by leakage. System engineers then walk down and assess the leakage prior to cleaning. If wastage is found, ISI and/or other engineering organizations evaluate whether the affected components can meet their structural and functional requirements, per the applicable design basis.

ARs for dry boric acid may be assigned to system engineers to be evaluated regarding system impact. If no impact exists, the system engineer may update the AR and close it.

As with any potential equipment problem, Operations will evaluate the effect on plant equipment and take action to isolate or depressurize any equipment that does not meet TS limits, poses a personnel safety hazard, or could affect the capability to perform its safety function.

Section XI IWA 5250(b) requires evaluation when there is greater than ten percent wall thinning; however, each condition is evaluated on a case-by-case basis. Potential actions include developing interim plans to mitigate the effects of the leak, monitoring the leak until corrective action is implemented, and notifying management if more immediate corrective action is required due to a worsening trend. Monitoring would be established on a case-by-case basis, depending upon the condition and function of the affected equipment.

Repair or replacement of RCPB components would be performed in accordance with DCPP's ASME Section XI repair and replacement program.

PG&E will enhance its training and procedural instructions to provide direction to personnel performing corrosion evaluations. Specific reference to the corrosion rate data in the EPRI Boric Acid Corrosion Handbook will be provided.

Request No.5

Explain the capabilities of your program to detect the low levels of reactor coolant pressure boundary leakage that may result from through-wall cracking in the bottom reactor pressure vessel head incore instrumentation nozzles. Low levels of leakage may call into question reliance on visual detection techniques or installed leakage detection instrumentation, but has the potential for causing boric acid corrosion. The NRC has had a concern with the bottom reactor pressure vessel head incore instrumentation nozzles because of the high consequences associated with loss of integrity of the bottom head nozzles. Describe how your program would evaluate evidence of possible leakage in this instance. In addition, explain how your program addresses leakage that may impact components that are in the leak path.

PG&E Response to Request No.5

Periodic visual inspections by experienced personnel are considered the best method for early identification of boric acid leakage. As described above, the installed monitoring instrumentation in containment does not provide sufficient reliability of detection of small boric acid leaks. DCPP's procedures require identification of the location of the leakage source and any degradation caused by boric acid leakage. The area under the reactor vessel would be treated the same as the rest of the RCPB. The area where each BMI tube penetrates the insulation is examined thoroughly; it is expected that gravity would assist any leakage being visible below the insulation. If any evidence of leakage were found, it would be investigated, evaluated and corrective actions would be taken as required.

Although PG&E believes leakage would be detectable with the insulation in place, PG&E believes it is prudent to examine the surface of the lower head. Therefore, PG&E will remove insulation sufficient to permit inspection, and will inspect the surface of the lower reactor vessel once per three refueling outages, beginning in 2R11 (currently scheduled for February 2003) and Unit 1 Refueling Outage No. 12 (currently scheduled for April 2004) to inspect for leakage or corrosion. This schedule is consistent with NRC Bulletin 2002-02 given the cold leg temperatures at DCPP.

AD4.ID2 contains instructions on what to do if boric acid is found, including determining the source of a leak, preserving evidence, evaluating for wastage, and long-term corrective actions to control boric acid and prevent recurrence of problems. AD4.ID2 requires that any individual who discovers a leaking component identify and document the problem in accordance with DCPP's problem identification and resolution procedure. System engineering evaluates whether there is wastage of a component when boric acid is in contact with low alloy/carbon steel. Evidence is preserved until the leakage has been evaluated to determine its source, pathway, amount, and any target components. Components with wastage are evaluated by ISI to determine wall thickness. Other organizations are utilized as necessary to provide a complete evaluation.

Request No.6

Explain the capabilities of your program to detect the low levels of reactor coolant pressure boundary leakage that may result from through-wall cracking in certain components and configurations for other small diameter nozzles. Low levels of leakage may call into question reliance on visual detection techniques or installed leakage detection instrumentation, but has the potential for causing boric acid corrosion. Describe how your program would evaluate evidence of possible leakage in this instance. In addition, explain how your program addresses leakage that may impact components that are in the leak path.

PG&E Response to Request No.6

When properly performed and evaluated, visual examinations have been effective in detecting low levels of leakage. When found, evidence of leakage is thoroughly evaluated. Leakage is traced to its source and any components that may be impacted by that leakage are inspected and evaluated as necessary. Given the limited number of Class I carbon steel components installed at DCPP, PG&E believes that the scope and frequency of visual inspections will adequately detect low levels of leakage before significant wastage is able to occur.

PG&E has experience in low-rate through wall leakage detection as a result of early operational history socket weld cracks. In all cases, the leaks were detected before significant degradation of any adjoining components occurred.

Request No.7

Explain how any aspects of your program (e.g., insulation removal, inaccessible areas, low levels of leakage, evaluation of relevant conditions) make use of susceptibility models or consequence models.

PG&E Response to Request No.7

Susceptibility models have not been used at DCPP to limit RCPB inspection scope or methods.

Request No.8

Provide a summary of recommendations made by your reactor vendor on visual inspections of nozzles with Alloy 600/82/182 material, actions you have taken or plan to *take regarding vendor recommendations, and the basis for any recommendations that are not followed.*

PG&E Response to Request No.8

Westinghouse has not made any recommendations for visual inspections of Alloy 600/82/182 components.

Request No.9

Provide the basis for concluding that the inspections and evaluations described in your responses to the above questions comply with your plant Technical Specifications and Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55(a), which incorporates Section XI of the American Society of Mechanical Engineers (ASME) Code by reference. Specifically, address how your boric acid corrosion control program complies with ASME Section XI; paragraph IWA-5250 (b) on corrective actions. Include a description of the procedures used to implement the corrective actions.

PG&E Response to Request No.9

PG&E performs detailed general area inspections to detect indications of boric acid leakage from the RCPB. Plant procedures are consistent with IWA-5250 (b) requirements. Leakage sources are determined and any areas of corrosion damage are inspected and evaluated. DCPP procedures do not specifically include a 10 percent wall thickness allowance for general corrosion, however any areas of degradation would be evaluated by engineering to ensure that structural and functional requirements would be met.

DCPP's VT-2 exam procedure (ISI VT-2-1) directly incorporates the requirements of the ASME Section XI code. In accordance with plant procedures, leaks are documented, evaluated, and repaired per the ASME Section XI repair and replacement program. Procedure MA1.ID13 provides instructions on the repair and replacement of Section XI components, including the initial process for evaluation of degraded components.

The limits for DCPP RCPB leakage are provided in TS 3.4.13, which contains the following limiting condition for operation (LCO):

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 1 gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE;

d. 1 gpm total primary to secondary LEAKAGE through all steam generators (SGs); and

e. 500 gallons per day primary to secondary LEAKAGE through any one SG.

Routine surveillance testing is performed to ensure these requirements are met. Based on industry experience, leaks from reactor coolant system Alloy 600 penetrations have been well below the sensitivity of on-line leakage detection systems. If measurable leakage is detected by the on-line leak detection systems, the leak will be evaluated per the TS, and the plant will be shut down if required. Upon detection and identification of a leak, corrective actions will be taken to restore RCPB integrity. PG&E continues to meet the requirements of this TS.

Reactor Coolant Pressure Boundary Alloy 600 and Alloy 82/182 locations

Component	Material
Head Penetration tubes	*Alloy 600 with Alloy 82/182 welds*
Reactor Vessel lower head bottom mounted instrument tubes	*Alloy 600 with Alloy 82/182 welds*
Reactor vessel nozzle safe end welds	*Alloy 82/182*
Reactor vessel o-ring leakoff monitor piping	*Alloy 600 with Alloy 82/182 welds*
Unit 2 only - Pressurizer surge line connection	*Alloy 82/182*
Unit 2 only Pressurizer spray line connection	*Alloy 82/182*
Unit 2 only Pressurizer safety valve line weld (3 connections) and PORV line weld (one connection)	*Alloy 82/182*
*Steam generator heat transfer tubing and tube to tubesheet welds**	*Alloy 600 with Alloy 82/182 welds*
*Steam generator divider plate**	*Alloy 600 with Alloy 82/182 welds*
*Steam generator tube plugs**	*Alloy 600 with Alloy 82/182 welds*
Steam generator hot leg bowl drains	*Alloy 600 with Alloy 82/182 welds*

* *Steam generator heat transfer tubing is extensively inspected and evaluated by a separate program, and thus is not discussed in this response. Steam generator tube to tubesheet welds, divider plate and tube plugs are internal to the steam generators and thus are not discussed in this response.*