CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9709030340 DOC.DATE: 97/08/28 NOTARIZED: NO DOCKET #
FACIL:50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275
50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Ga 05000323
AUTH.NAME AUTHOR AFFILIATION
RUEGER,G.M. Public Service Electric & Gas Co. of New Jersey
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Provides response to NRC concerns re installation of CCW surge tank pressurization sys at DCPP.

DISTRIBUTION CODE: A001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 15
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD4-2 LA	1	1	PD4-2 PD	1	1
	BLOOM,S	1	1			
INTERNAL:	ACRS	1	1	FILE CENTER 01	1	1
	NRR/DE/ECGB/A	1	1	NRR/DE/EMCB	1	1
	NRR/DRCH/HICB	1	1	NRR/DSSA/SPLB	1	1
	NRR/DSSA/SRXB	1	1	NUDOCS-ABSTRACT	1	1
	OGC/HDS3	1	0			
EXTERNAL:	NOAC	1	1	NRC PDR	1	1

CATEGORY 1 DOCUMENT

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL 13

Pacific Gas and Electric Company

245 Market Street, Room 937-N9B
San Francisco, CA 94105
Mailing Address
Mail Code N9B
P.O. Box 770000
San Francisco, CA 94177
415/973-4684 Fax 415/973-2313

Gregory M. Rueger
Senior Vice President and
General Manager
Nuclear Power Generation

August 28, 1997

PG&E Letter DCL-97-151

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Staff's Concerns Regarding Installation of the Component Cooling Water Surge Tank Pressurization System - Diablo Canyon Power Plant, Units 1 and 2

Dear Commissioners and Staff:

This letter provides PG&E's response to the NRC staff's concerns regarding installation of the component cooling water (CCW) surge tank pressurization system at Diablo Canyon Power Plant (DCPP), Units 1 and 2.

Pursuant to an NRC staff request on May 23, 1997, PG&E submitted its 10 CFR 50.59 safety evaluation for installation of the CCW surge tank pressurization system (Ref. PG&E letter DCL-97-108 dated June 12, 1997). In a letter dated July 23, 1997, the NRC staff identified several concerns regarding the adequacy of the 10 CFR 50.59 safety evaluation.

The NRC staff was concerned that several topics were not adequately addressed in the 10 CFR 50.59 safety evaluation including: (1) potential for vapor binding of the CCW pumps (CCWPs) due to pressurization of the system; (2) effect on heat transfer assumptions and the containment analysis previously performed; (3) effect on system leak rate and water inventory considerations; (4) planned administrative controls; (5) impact of dissolved nitrogen on CCW thermal conductivity; (6) impact of dissolved nitrogen on CCWP net positive suction pressure; (7) specific equipment malfunction and single failure considerations; (8) potential for gradual buildup of nitrogen in the CCW system over time; (9) potential for nitrogen gas release during DBA conditions; and (10) potential for increasing the consequences of an accident during the installation when the surge tank would not be automatically isolated in the event radioactive material was detected in the CCW system.

A001

The attached enclosure addresses each of the NRC staff's concerns. Each of the NRC concerns was evaluated previously by PG&E during the design change

package (DCP) process. As a result of performing these evaluations during the DCP process, when the 10 CFR 50.59 safety evaluation was performed, PG&E had a sound technical basis for concluding that accident consequences were not increased and that no new malfunctions had been introduced. For the most part, the 10 CFR 50.59 safety evaluation presented only the summary conclusions of the safety evaluation process. The supporting details were contained in the DCPs. Both the 10 CFR 50.59 safety evaluation and the DCPs for pressurization system installation were reviewed by the Plant Staff Review Committee prior to installation.

If the NRC desires further information to be provided, PG&E is willing to either submit the design documentation referred to in this submittal, or to revise the 10 CFR 50.59 safety evaluation to include the additional detail from the pertinent DCPs. PG&E is also willing to meet with the NRC to discuss this issue.

In the July 23, 1997, letter the staff indicated that the installation of the pressurization system may have resulted in an increase in the probability of occurrence of a malfunction, introduced a new malfunction, or increased the consequences of an accident.

PG&E has reviewed it's decision to install the CCW surge tank pressurization system under the 10 CFR 50.59 process. In part, 10 CFR 50.59 states that changes shall be deemed to involve an unreviewed safety question (USQ) if the probability of occurrence of a malfunction, or the consequences of a malfunction of equipment important to safety previously evaluated in the SAR may be increased.

In regards to the malfunction issues, the CCW surge tank pressurization system is designed to mitigate the consequences of an accident, and cannot initiate an accident. Therefore it cannot increase the probability of a malfunction previously evaluated in the SAR. Failure of the CCW surge tank pressurization system does not involve a new malfunction in that the pressurization system would fail and cause depressurization of the surge tank. This is because the safety function of the system is to maintain surge tank pressure only for the first minute of a design basis loss-of-coolant accident (LOCA) with concurrent loss-of-offsite power. The system is designed to maintain CCW surge tank pressure before the LOCA occurs, and the components added by the system installation have no active safety function to perform once the accident has occurred. The only safety-related function of the components of the system is to maintain pressure boundary integrity. The non mechanistic failure of these components is not postulated within the first 24 hours following a LOCA. A calculation was performed as part of the DCP that verified, based on the surge tank low pressure alarm setpoint, instrument uncertainty, tank leakage as verified by surveillance

test, and other conservative system parameters, that the surge tank would remain pressurized greater than 17 psig during the first minute of the accident, even if the pressure supply regulator were to fail closed. Since the failure of the surge tank is non mechanistic and pressurization of the tank does not introduce a mechanistic failure mechanism, a new malfunction is not introduced.

In regards to the consequences of an accident or malfunction being increased, PG&E concluded there would be no increase in consequences. The modification would not impact the heat transfer capability of the CCW system to provide cooling to safety-related components during accident conditions. Also the compensatory measures that were established during system installation maintained CCW system operability and compliance with licensing requirements.

Therefore, under the criteria of the 10 CFR 50.59 process, PG&E came to the conclusion that installation of the system did not involve a USQ. PG&E continues to believe this to be true for the following reasons:

1. The design of the DCPP CCW system is not unique. The design and function of the DCPP CCW system is similar to reactor auxiliary cooling water systems installed in other light water reactor power plants. Consequently, it does not involve new design review issues.

2. Installation of the pressurization system is consistent with NUREG 0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition," dated July 1981, Section 9.2.2, "Reactor Auxiliary Cooling Water Systems."

3. Installation of the pressurization system is consistent with the DCPP licensing bases including Final Safety Analysis Report Update, Section 9.2.2, "Component Cooling Water System," and Supplemental Safety Evaluation Report No. 16, dated August 1983.

Sincerely,

Gregory M. Rueger

COMMITMENT TRACKING INFORMATION
(Information to be removed prior to NRC submittal)

Document: PG&E Letter DCL-97-151 dated August 28, 1997

File Location: S:\RS\TAS\GRP_WORK\LARS\1997-LAR\97-05\5059RAI.DOC

Subject: Response to NRC Staff's Concerns Regarding Installation of the Component Cooling Water Surge Tank Pressurization System - Diablo Canyon Power Plant, Units 1 and 2

Commitment #1 If the NRC desires further information to be provided, PG&E is willing to either submit the design documentation referred to in this submittal, or to revise the 10 CFR 50.59 safety evaluation to include the additional detail from the pertinent DCPs.

Responsibility:	Portney, J.
Department:	BOP Engineering
Tracking Document:	A0442230 AE#2
Outage Related?	No
Commitment Type:	F
PCD Commitment?	No
Estimated Cost:	< $15,000 (Others per XI1.ID1)
Nature of Cost:	O&M, one-time (Others per XI1.ID1)

cc: Donald B. Allen
Steven D. Bloom
Ellis W. Merschoff
Kenneth E. Perkins
Diablo Distribution

Enclosure

JER/2057

PG&E Response to NRC Staff's Concerns Regarding Installation of the Component Cooling Water Surge Tank Pressurization System - Diablo Canyon Power Plant, Units 1 and 2

Background

The component cooling water (CCW) system is designed to remove normal, shutdown, and accident heat from safety-related and non safety-related equipment, and to act as a monitored intermediate barrier between the reactor coolant system and the ultimate heat sink.

During an evaluation to increase the maximum allowable supply temperature for the CCW system, PG&E identified that during a design basis loss-of-coolant accident (LOCA), coincident with a loss of offsite power (LOOP) or with a degraded startup (230 kV) power supply, the CCW water in the containment fan cooling units (CFCU) cooling coils could flash to steam. This condition was not in accordance with Final Safety Analysis Report (FSAR) Update, Revision 10, Section 9.2.2.2.7, which stated that localized boiling would not occur in the CFCUs during a limiting design basis accident (DBA). This condition was reported in Licensee Event Report 1-96-005-01 (Ref. PG&E letter DCL-96-159, dated July 31, 1996). PG&E installed a nitrogen pressurization system on the CCW surge tanks for both units to prevent CCW boiling and to restore the CCW system to its original design and licensing basis.

CCW Surge Tank Pressurization System Design

Pressurization of the CCW system was performed under PG&E's design change package (DCP) process which included performing a safety evaluation in accordance with the requirements of 10 CFR 50.59. Design of the pressurization system required that the modification consider the effects of pressurized nitrogen (blanketing the surge tank) on the capability of the CCW system to perform its design basis function as well as licensing basis requirements that are specified in the FSAR Update and Supplemental Safety Evaluation Report (SSER) No. 16. These included considering the effects of system inleakage, system outleakage, tornado impact, system malfunctions and consequences, single active and passive failure criteria, and containment accident analyses.

The safety function of the pressurization system is to maintain surge tank pressure for the first minute of a design basis LOCA with LOOP. Given this safety function, several specific licensing issues (including inleakage, outleakage, tornado, and passive failure) did not need to be considered as simultaneous failures with the LOCA. However, the pressurization system design did consider the impact of inleakage, outleakage, tornado, and equipment failure outside of a DBA scenario to ensure that CCW will provide adequate cooling during normal and shutdown operations.

The impact of modifying the CCW system from a normally vented system to a system normally pressurized with nitrogen was evaluated from many perspectives, including heat transfer capability, pressure boundary integrity, operation of instrumentation and mechanical equipment, off-gassing, and single failure capability. These evaluations were documented in the DCP and/or the 10 CFR 50.59 evaluation. Additional documentation of CCW design capability is contained in calculations or design change memoranda where the impact of the modification could not be evaluated by readily available data or where previous formal analyses were being revised as a result of the modification. In some cases, statements in the DCP or the 10 CFR 50.59 safety evaluation were made based on an engineering review of the issue and a judgment that detailed documentation was not required based on readily available data and the overall impact on the ability of the system to meet its design basis requirements.

The DCPs and 10 CFR 50.59 safety evaluations for both Units were reviewed by the Plant Staff Review Committee (PSRC) prior to installation of the surge tank pressurization systems. The systems were installed in 1996 under DCP M-49284 for Unit 1 while at power, and under DCP M-50284 for Unit 2 prior to startup from its seventh refueling outage.

The CCW surge tank pressurization systems for both units are controlled administratively by an equipment control guideline (ECG). The ECG requires: 1) the system to be operable in modes 1, 2, 3, and 4; 2) the surge tank pressure to be verified as acceptable every 12 hours and; 3) leak rate testing to be done every 24 months. In License Amendment Request 97-05 (ref. PG&E letter DCL-97-074 dated May 22, 1997), PG&E proposed placing these systems under the control of technical specifications.

Pursuant to an NRC staff request on May 23, 1997, PG&E submitted its 10 CFR 50.59 safety evaluation for installation of the CCW surge tank pressurization system (Ref. PG&E letter DCL-97-108 dated June 12, 1997). In a letter dated July 23, 1997, the NRC staff identified several concerns regarding the adequacy of the 10 CFR 50.59 safety evaluation.

NRC Staff Concerns

The NRC staff identified that it was concerned that several topics were not adequately addressed in the 10 CFR 50.59 safety evaluation including: (1) potential for vapor binding of the CCWPs due to pressurization of the system; (2) effect on heat transfer assumptions and containment analysis previously performed; (3) effect on system leak rate and water inventory considerations; (4) planned administrative controls; (5) impact of dissolved nitrogen on CCW thermal conductivity; (6) impact of dissolved nitrogen on CCWP net positive suction pressure; (7) specific equipment malfunction and single failure considerations; (8) potential for gradual buildup of nitrogen in the CCW system

over time; (9) potential for nitrogen gas release during DBA conditions; and (10) potential for increasing the consequences of an accident during installation when the surge tank would not be automatically isolated in the event radioactive material was detected in the CCW system.

PG&E has performed a review of each of the staff's concerns, and the results are discussed below. From this review, PG&E has concluded that each of the NRC concerns had been addressed in the 10 CFR 50.59 evaluation process or in the DCP process. The 10 CFR 50.59 safety evaluation, for the most part, presented only the conclusions of the safety evaluation process. The supporting details were contained in the DCPs. Both the 10 CFR 50.59 safety evaluation and the DCPs for pressurization system installation were reviewed by the PSRC prior to installation.

NRC Concern No. 1 -- Vapor Binding of the CCWPs

References: DCP M-49284 and DCP M-50284

PG&E Response No. 1

The concern of vapor binding of the CCWPs was addressed in DCPs M-49284 and M-50284. The following is a summary of the DCP considerations and evaluations on gas binding of the CCWPs.

Pressurizing the top of the surge tank, which is the highest point of the CCW system, maintains the vapor space approximately 95 feet above the CCWP elevation. During normal operation, makeup controls and level alarms are designed to maintain a minimum of 4000 gallons in the tank to satisfy a licensing basis outleakage requirement of 200 gpm for 20 minutes as specified in SSER 16 and FSAR Update 9.2.2.2.3. The basis for this licensing requirement is that it allows operations personnel to identify and isolate the leak prior to voiding the surge tank and losing CCWP net positive suction head (NPSH). Normal tank level is sufficient to accommodate level fluctuations due to normal system thermal and hydraulic loading. The pressurization system regulators are sized to maintain nitrogen pressure greater than 17 psig and less than approximately 25 psig. The acceptability of CCWP NPSH based on this modification during normal operation and as a result of a licensing basis outleakage event was evaluated and found acceptable by a formal calculation.

During normal operation, a minimum of two out of three CCWPs operate as required by Technical Specification 3.7.3, "Vital Component Cooling Water System." Based on the solubility of nitrogen, the nitrogen blanket pressure (17-25 psig) determines the concentration of nitrogen throughout the CCW system. The normal operating pump suction pressure is approximately 60 psig, which prevents the saturated nitrogen from

coming out of solution. Normal operating pump return temperatures are approximately 70°F and can increase to a maximum of approximately 240°F during a limiting DBA.

Published chemistry data supports the potential for nitrogen to degas at elevated temperatures. During preparation of the DCP the volume of gas coming out of solution at a CCW supply temperature of 140°F was estimated to be relatively small (approximately 3 percent by volume). Based on this data, engineering judgment was used to conclude that degasification of the nitrogen at this elevated temperature was insufficient to cause gas binding of the CCWPs. PG&E has subsequently performed a formal calculation that shows nitrogen degasification at temperatures up to 240°F is bounded by the original judgment. Therefore, gas binding of the CCWPs during normal operation, during post accident operation, or during an outleakage event is not expected to occur.

DCP M-49284 and DCP M-50284 evaluated the potential for nitrogen degasification and potential gas binding of the CCWPs in the event of a rapid depressurization. Published chemistry data supports the conclusion that the pressure affect on nitrogen solubility (from 25 psig to atmospheric pressure) is bounded by the thermal affect on nitrogen solubility discussed above. The DCPs stated:

> "Although degasification of the compressed gas within the CCW system in the event of rapid depressurization could occur and potentially affect heat transfer capability and CCWP NPSH, failure of the proposed modification is not postulated concurrent with a LBLOCA due to the passive safety function of the modification. Venting of the tank during Modes 5 or 6 to perform system maintenance may cause degasification, but CCWPs have significant NPSH margin in these modes to preclude the possibility of cavitation. Additionally, the volume of gas produced by depressurization from 25 psig to atmosphere is not expected to cause gas binding of the CCWPs."

In order to preclude the potential of a line break which could cause a rapid depressurization, all pressurization system components, tubing, and instrumentation were designed and installed to be seismically qualified and meet Design Class I standards. In addition, Operations procedures were revised to provide guidance on slowly (over 30 minutes) depressurizing the CCW surge tank for maintenance in Modes 5 and 6 and monitoring for pump cavitation. In April 1997, during the Unit 1 eighth refueling outage (1R8), the Unit 1 surge tank was successfully depressurized using this procedure and no indications of nitrogen degasification were found.

NRC Concern No. 2 -- Heat Transfer Assumptions and Containment Analysis

PG&E Response No. 2

Based on the chemical properties of nitrogen (solubility and conductivity), and the small concentration of nitrogen dissolved in the CCW system, the overall impact to CCW thermal conductivity was judged to be insignificant. This was addressed in the 10 CFR 50.59 evaluation as follows:

> "Pressurization of the CCW surge tank will not adversely affect the heat transfer capability of the CCW system and components. The impact of increased dissolved gas within the cooling water at increased pressure has been reviewed and determined to not significantly impact CCW thermal conductivity."

Additionally, an evaluation of the pressurization system on the accident analyses in Chapters 6 and 15 of the FSAR Update was evaluated in DCPs M-49284 and M-50284. Based on published chemistry data and engineering judgment regarding heat transfer capability, the conclusion of the DCP was that the modification did not affect any accident analyses.

NRC Concern No. 3 -- System Leak Rate and Water Inventory Considerations

PG&E Response No. 3

The CCW system outleakage criteria of 200 gpm for 20 minutes was based on a non mechanistic moderate energy pipe break as discussed in SSER 16 and FSAR Update Section 9.2.2.2.3. This criteria was used to size the minimum volume contained in the CCW surge tank. The affect of the pressurization system on CCW system leak rate criteria and water inventory was evaluated in both the 10 CFR 50.59 evaluation and the DCP. The following is an excerpt from DCPs M-49284 and M-50284:

> "It should be noted that FSAR Update Section 9.2.2.2.3 identifies that the CCW surge tank volume was sized based on a non-mechanistic leak of 200 gpm from the system. The proposed modification will not adversely affect the pressure boundary integrity of any existing CCW components. Additionally, the proposed modification meets the design, material, and construction standards applicable to the CCW system and does not create a new failure mode which could increase the probability for CCW system leakage. All installed tubing, valves, regulators, bottles, and instruments which are part of the surge tank pressure boundary will be Design Class I. All tank pressure boundary components to be added by this modification will be seismically qualified and installed to Seismic Category I requirements. Because the basis for the 200 gpm for 20

> minutes out-leakage was a non-mechanistic failure and operator action is credited in FSAR Update Table 9.2-7(5) to establish Class I makeup to the surge tank within 10 minutes, pressurization of the surge tank will not affect the licensing requirement as specified in SSER 16 for minimum surge tank volume based on system out-leakage. Therefore, the probability of occurrence of an out-leakage event is not increased."

Therefore, PG&E concluded that the addition of pressurized nitrogen to the top of the surge tank did not affect previous staff review of the CCW system outleakage criteria. Additionally, increasing the pressure on the surge tank has no effect on the water inventory in the tank since the volume (makeup) is controlled by the existing level instruments that measure differential pressure.

NRC Concern No. 4 -- Administrative Controls

PG&E Response No. 4

Several administrative controls were established as prudent measures to support the pressurization modification, which was not required for CCW system operability at the time the design change and 10 CFR 50.59 evaluation were approved. Examples of these controls include low pressure and high pressure tank alarms, loss of plant nitrogen supply alarm, operations procedure revisions, and surveillance tests to verify tank pressure and leakage and backup bottle pressure. When the pressurization system was determined, by analysis, to be required for CCW system operability to prevent boiling in the CFCUs, administrative controls were established for the system under ECG 14.1, "CCW Surge Tank Pressurization System." ECG 14.1 was reviewed and approved by the PSRC prior to closure of DCP M-49284 for Unit 1 and prior to Unit 2 startup from its seventh refueling outage.

Currently ECG 14.1 and associated surveillance test procedures are used to verify operability of the surge tank pressurization system.

NRC Concern No. 5 -- Impact of Dissolved Nitrogen on CCW Thermal Conductivity

PG&E Response No. 5

Based on the chemical properties of nitrogen (solubility and conductivity), and the small concentration of nitrogen dissolved in the CCW system, the overall impact to CCW thermal conductivity was judged to be insignificant. This was addressed in the 10 CFR 50.59 evaluation as follows:

> "Pressurization of the CCW surge tank will not adversely affect the heat transfer capability of the CCW system and components. The impact of increased dissolved gas within the cooling water at

> increased pressure has been reviewed and determined to not significantly impact CCW thermal conductivity."

NRC Concern No. 6 -- Impact of Dissolved Nitrogen on CCWP NPSH

PG&E Response No. 6

As described in PG&E response no. 1, the volume of gas coming out of solution at worst case conditions is estimated to be approximately 3 percent by volume. This is based on the solubility of nitrogen and the small concentration dissolved in the CCW system due to the nitrogen blanket pressure, Based on this estimate, engineering judgment was used during preparation of DCPs M-49284 and M-50284 to assess that the impact of any degasification would not impact NPSH. PG&E has subsequently performed a formal calculation to support this evaluation.

NRC Concern No. 7 -- Specific Equipment Malfunction and Single Failure Considerations

PG&E Response No. 7

DCPs M-49284 and M-50284 contain specific equipment malfunction and single failure considerations. Failure or malfunction of critical equipment installed as part of the pressurization modification was evaluated in the failure modes and effects section.

The function of the pressurization system and the issue of single failure was also evaluated in DCPs M-49284 and M-50284 as follows:

> "Because the proposed modification will maintain CCW surge tank pressure before the LBLOCA occurs, the components added by this modification have no active safety function to perform once the accident has occurred. Therefore, the only safety-related function of the components added by this modification is to maintain pressure boundary integrity and thus, failure of these components is not postulated within the first 24 hours following a LOCA per FSAR Update Section 3.1.1."

A calculation was performed during preparation of DCPs M-49284 and M-50284 to document acceptability of the above statement. Based on tank low pressure alarm setpoint, instrument uncertainty, tank leakage as verified by surveillance test, and other conservative system parameters, the surge tank can maintain greater than 17 psig during the initial stages of the accident, as required, even if the supply regulator were to fail closed.

NRC Concern No. 8 -- Gradual Buildup of Nitrogen in the CCW System Over Time

PG&E Response No. 8

Based on the chemical properties of nitrogen, an assumption was made during the preparation of DCPs M-49284 and M-50284 that nitrogen would be dissolved in the CCW system. The determination of the concentration of dissolved nitrogen is based on the blanket pressure in the tank. PG&E does not believe that nitrogen can build up to any higher level based on standard nitrogen properties data.

Degasification and potential accumulation of nitrogen in CCW components is minimized based on CCW system operation and the physical layout of the CCW system. A majority of the CCW system has continuous CCW flow which prevents nitrogen from building up in system components. For the few CCW components that are typically isolated from CCW flow (i.e. residual heat removal system heat exchanger, excess letdown heat exchanger), the static head provided by the surge tank (since these components are isolated only on the CCW return side) provides pressure greater than the nitrogen blanket pressure on the surge tank, thus inhibiting the nitrogen from coming out of solution.

NRC Concern No. 9 -- Potential for Nitrogen Gas Release During DBA Conditions

PG&E Response No. 9

Two conditions, rapid depressurization of the surge tank, and elevated CCW temperature during post accident conditions, could cause nitrogen to degas within the CCW system during a DBA. The volume of nitrogen gas released into the CCW system in both cases was judged during the preparation of DCPs M-49284 and M-50284 to not adversely affect the heat transfer capability of the CCW system. The basis for this judgment is described in PG&E Response No. 1 above.

Rapid depressurization of the CCW surge tank would require postulation of a passive failure of a component causing loss of pressure boundary. Per FSAR Update Chapter 3, a passive failure is not required to be postulated until 24 hours after the initiation of the DBA, at which time CCW temperature and containment temperature and pressure will be reduced.

NRC Concern No. 10 -- Compensatory Measures and Increase in Malfunction or Consequences due to Loss of Automatic Isolation

PG&E Response No. 10

Compensatory measures which were identified and evaluated in the 10 CFR 50.59 evaluation, were judged necessary during the construction of the modification in order to maintain CCW system operability and to maintain licensing basis requirements for CCW system inleakage. As stated in the 50.59 evaluation:

> "The inleakage discussions in FSAR Update Chapter 9 do not form the licensing basis for dose calculations. Chapters 11 and 15 do not contain dose consequence evaluations for inleakage except for the normal, minor quantities described in Table 11.2-5. The DCP changes do not affect these small quantities."

The compensatory measures were provided in place of the vent path isolation feature and are considered to be equivalent to the valve to deal with any inleakage which might have occurred during the short period of time the system was opened. Minimization of the time that the system was breached was judged to be of such importance that implementation of the design on the operating Unit (Unit 1 was in Mode 1, Unit 2 was in a refueling outage) was modified to use an existing drain valve as the pressurization port, thus minimizing the time that the surge tank pressure boundary was breached. Further modifications to the Unit 1 tank to make the design consistent with Unit 2 were made in 1R8.

Because the 10 CFR 50.59 safety evaluation for the pressurization system installation concluded that the installation did not involve an unreviewed safety question, the installation did not require prior Commission approval. Accordingly, the 10 CFR 50.59 safety evaluation and the associated compensatory measures established for the installation were not submitted for staff review.

Conclusion:

PG&E has reviewed each of the NRC concerns and concludes that each concern had previously been addressed in the DCP process. As a result of performing these evaluations during the DCP process, when the 10 CFR 50.59 safety evaluation was performed, PG&E had a sound technical basis for concluding that accident consequences were not increased and that no new malfunctions had been introduced. Concerns relating to the solubility of nitrogen and its effects on the CCW system were addressed during DCP process. They were assessed based on published chemistry data and the estimated volume of gas that would come out of solution. PG&E has subsequently performed a formal calculation to support its conclusions in this area.

The 10 CFR 50.59 safety evaluation, for the most part, only presented the conclusions of the safety evaluation process. The supporting details were contained in the DCPs. Both the 10 CFR 50.59 safety evaluation and the DCPs were reviewed by the PSRC prior to installation.