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PG&E Letter DCL-02-100

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

Docket No. 50-323, OL-DPR-82
Diablo Canyon Unit 2
Request for Enforcement Discretion Regarding Compliance with Technical
Specification 3.7.7, "Vital Component Cooling Water (CCW) System"

Dear Commissioners and Staff:

Pursuant to the provisions of Section VII.C of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," PG&E requests enforcement discretion regarding compliance with Technical Specification (TS) 3.7.7, "Vital Component Cooling Water (CCW) System." The request is made to allow continued operation of Diablo Canyon Power Plant (DCPP) Unit 2 with one CCW loop inoperable for an additional 72 hours beyond the 72-hour Completion Time specified in TS 3.7.7, Action A. One vital loop is considered inoperable due to the inoperability of CCW Pump 2-3.

On August 19, 2002, at 03:32 PDT, the DCPP Unit 2 CCW Pump 2-3 was declared inoperable during investigations of the cause for a CCW Pump feeder ground alarm. Investigations identified that the alarm resulted from a ground in one phase of the CCW Pump 2-3 motor feeder cable.

The schedule for the installation of the replacement CCW Pump 2-3 motor feeder cable indicates that approximately 144 hours will be required to complete the cable installation and post-maintenance testing assuming all work proceeds as planned, including approximately 14 hours of contingency time to accommodate unanticipated problems with cable installation. This schedule will exceed the CCW loop 72-hour Completion Time by 72 hours. Therefore, PG&E requests that the NRC exercise discretion regarding the enforcement of the TS 3.7.7, Action A, Completion Time for 72 hours. The proposed enforcement discretion period would expire at 03:32 PDT on August 25, 2002.

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The safety basis for this request, a justification for the duration of the noncompliance, compensatory measures, and an evaluation of the potential impact on the public health and safety and the environment are enclosed as required by the Nuclear Regulatory Commission's Inspection Manual, Part 9900 - Technical Guidance, "Operations - Notices of Enforcement Discretion."

Sincerely,

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Enclosure

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**REQUEST FOR ENFORCEMENT DISCRETION REGARDING COMPLIANCE
WITH TECHNICAL SPECIFICATION (TS) 3.7.7, "VITAL COMPONENT
COOLING WATER (CCW) SYSTEM"**

INTRODUCTION

Pursuant to the provisions of Section VII.C of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," PG&E requests regional enforcement discretion regarding compliance with Technical Specification (TS) 3.7.7, "Vital Component Cooling Water (CCW) System." The request is made to allow continued operation of Diablo Canyon Power Plant (DCPP) Unit 2 with one vital CCW loop inoperable for an additional 72 hours beyond the 72-hour Completion Time specified in TS 3.7.7, Action A. One vital loop is considered inoperable due to the inoperability of CCW Pump 2-3.

**1. TECHNICAL SPECIFICATION REQUIREMENT OR OTHER LICENSE
CONDITIONS THAT WILL BE VIOLATED**

The DCPP TS 3.7.7 limiting condition for operation states: "Two vital CCW loops shall be OPERABLE." TS 3.7.7 is applicable in Modes 1, 2, 3, and 4. In order for both vital loops to be operable, vital headers A and B, both CCW heat exchangers, the CCW surge tank, and all three CCW pumps must be operable.

With one vital CCW loop inoperable, TS 3.7.7, Action A, requires that the inoperable vital CCW loop be restored to operable status within 72 hours.

PG&E requests regional enforcement discretion, for DCPP Unit 2, for the NRC to not enforce the provisions of TS 3.7.7, Action A, for an additional 72 hours (until 03:32 PDT on August 25, 2002) to allow sufficient time to replace the CCW Pump 2-3 motor feeder cable, perform post-maintenance testing, and return the pump to operable status.

**2. CIRCUMSTANCES SURROUNDING THE SITUATION, INCLUDING
APPARENT ROOT CAUSES, THE NEED FOR PROMPT ACTION AND
IDENTIFICATION OF ANY RELEVANT HISTORICAL EVENTS**

Background and Cause of Event

On August 18, 2002, at 22:00 PDT, while DCPP Unit 2 was at 100 percent power and the DCPP Unit 2 CCW Pump 2-3 was running, a brief CCW Pump 2-3 feeder ground alarm was received. A walkdown of CCW Pump 2-3 and the associated breaker did not identify any problems. The CCW Pump 2-3 stator current and temperature were also normal. The ground alarm cleared.

On August 18, 2002, at 22:51 PDT and on August 19, 2002, at 00:04 PDT, additional CCW Pump 2-3 feeder ground alarms were received. The duration of each alarm was less than 0.3 seconds. Following the alarm that occurred on August 19 at 00:04 PDT, CCW Pump 2-1 was started and CCW Pump 2-3 was shut down. The CCW Pump 2-3 breaker cubicle was opened and inspected for abnormal indications. No abnormal odors or problems were noted in the breaker cubicle. A review of the plant drawings determined that relay 50NHH12, which senses a ground between the CCW Pump 2-3 pump motor and breaker, was the source of the alarm.

On August 19, 2002, at 03:32, Operations decided to declare the CCW Pump 2-3 inoperable until investigations of the pump relay, motor, and cable could be completed.

On August 19, 2002, the feeder cable and motor were meggered at 2500 VDC, and no problems were identified (196 Megohm). The feeder cable and motor were subsequently tested using a high potential tester and they failed this test when ramping up from 2500V to 4000V. The motor and cables were then determined and each was tested independently. The motor and feeder cable phases A and B tested satisfactorily at 2500V, but the phase C cable failed this test.

On August 20, 2002, additional testing was performed using a cable testing system to try and determine the fault location. Using this test method and comparing the test results for all three phases, it was confirmed that phase C had failed. Based on a subjective evaluation of the test results, the fault appears to be located approximately 91 feet from the switchgear in the underground conduit between the turbine building and the auxiliary building. The total length of this cable from breaker to motor is approximately 464 feet.

Following the identification of the ground in CCW Pump 2-3 motor feeder cable, additional work was performed to develop the repair plan, repair schedule, work orders, and clearances required to support the removal of the faulted cable and the installation of a replacement cable.

In similar situations for other applications, PG&E has found that the faulted cables were located outside of structures, and in most of the past failures water or other contaminants have been present.

To determine if there was water in the embedded conduit containing the fault, the conduit seals were removed. No evidence of water was identified. To further pursue this potential cause, a boroscope inspection of the conduit was completed with no visual evidence of defects. All three phases of feeder cable have been removed. After cable removal, no obvious cause has been identified. PG&E has hired a cause analysis consultant, who arrived at DCPD on August 21, 2002, to evaluate the root cause of the cable failure. Continuing

investigation of the root cause of the failure will be tracked under the DCPD corrective action program via Nonconformance Report N0002150. No other equipment problems with 4 kV loads have been identified.

PG&E is completely replacing the three phases of the cable as a permanent repair.

Need For Prompt Action

A review of the schedule for installation of the replacement CCW Pump 2-3 motor feeder cable indicates that it is expected that approximately 144 hours will be required to complete the cable installation and post-maintenance testing assuming all work proceeds as planned, including approximately 14 hours of contingency time to accommodate unanticipated problems with cable installation. This schedule will exceed the CCW loop 72-hour Completion Time by 72 hours. Prompt action is requested for the NRC to provide discretion to not enforce the provisions of TS 3.7.7, Action A, for a period of 72 hours until 03:32 PDT on August 25, 2002. This should allow adequate time to complete installation of all three phases of the CCW Pump 2-3 feeder ground cable, perform post-maintenance testing, and return the associated vital CCW loop to service without placing the plant through an unnecessary transient to cold shutdown conditions. The ground in the CCW Pump 2-3 motor feeder cable was not anticipated. No CCW Pump 2-3 feeder ground alarms have occurred in the recent past.

Relevant Historical Events

DCPD has experienced seven medium voltage cable failures since 1989. Six of these failures were associated with cables in conduits exposed to an outside environment. For five of these cables, water accumulation was documented in the cable vaults and pull boxes near the point of failure. For the sixth and seventh failures, these non-quality cables were thoroughly evaluated, external causes were eliminated, yet no root cause was identified.

The CCW Pump 2-3 motor feeder cable was removed and there were no indications of water in the conduit. The CCW Pump 2-3 motor feeder cable is not exposed to an outside environment.

3. SAFETY BASIS FOR THE REQUEST, INCLUDING AN EVALUATION OF THE SAFETY SIGNIFICANCE AND POTENTIAL CONSEQUENCES OF THE PROPOSED COURSE OF ACTION. THIS EVALUATION SHOULD INCLUDE AT LEAST A QUALITATIVE RISK ASSESSMENT USING BOTH RISK INSIGHTS AND INFORMED JUDGMENTS, AS APPROPRIATE

Safety Significance and Potential Consequences

The CCW system provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal and shutdown operations, the CCW system provides this function for safety-related components, various nonessential components, and the spent fuel storage pool. The CCW system serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the ASW system, and therefore to the environment. The principal safety related functions of the CCW system are the removal of postulated accident generated containment heat via the containment fan cooling units, removal of decay heat from the reactor via the residual heat removal (RHR) system, and cooling of required vital equipment. Decay heat removal is required during a normal or post accident cooldown and shutdown. Although the heat load on the CCW system is less following a shutdown as compared to an event that occurs at 100 percent power, CCW operation is required in either case.

The CCW system consists of three CCW pumps powered by separate vital buses, two CCW heat exchangers, and a two chamber CCW surge tank. The piping system consists of three parallel headers. The headers are common to all three CCW pumps. The headers extend from the outlet of the heat exchangers, through the header heat loads, to the suction of the CCW pumps. The two vital headers serve redundant engineered safety feature (ESF) loads and the non-redundant post-loss-of-coolant accident (LOCA) sample coolers. A third, non-vital header serves non-vital equipment. Each of the headers are separable from the others to mitigate a passive single failure during post-LOCA long term cooling. The divided surge tank is connected to the vital header return piping and is sized to meet system leakage requirements and maintain adequate net positive suction head on system pumps. The CCW system is designed to perform its function with a single failure of any component. All three pumps automatically start on receipt of a safety injection signal, and provide flow. The non-vital header is automatically isolated on hi-hi containment pressure. The unavailability of one CCW pump has no impact on the capability of the CCW system to remove heat, which normally operates with two pumps and a third in standby.

In the event of a DBA, one vital CCW loop is required to operate to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two vital

loops of CCW must be operable. At least one CCW loop will operate assuming the worst case single active failure occurs coincident with a loss of offsite power. To meet the TS 3.7.7 limiting condition for operation on CCW loops, vital headers A and B, both CCW heat exchangers, the surge tank, and all three CCW pumps must be operable. Although one CCW pump is currently inoperable, the other two pumps are operable and capable of providing the required heat removal capability following an accident or normal shutdown.

Risk Assessment

An assessment was performed of the change in the core damage frequency (CDF) to allow continued operation while repairing CCW Pump 2-3 cabling beyond the TS 3.7.7, Action A, Completion Time of 72 hours. The assessment considered increasing the completion time to a total of 144 hours and uses the "at power" probabilistic risk assessment (PRA) model including both internal and seismic hazards. Note that one of the main functions of the CCW system is to provide cooling for safety and nonsafety related components after reactor shutdown. Therefore, the "at power" increase in risk due to the proposed extension in CCW system completion time is balanced against the incremental "shutdown transition and operating" risk while CCW Pump 2-3, RHR Pump 2-2, and safety injection (SI) Pump 2-2 are out-of-service (OOS). SI Pump 2-2 and RHR Pump 2-2 will be de-energized while repairing CCW Pump 2-3 cabling to ensure personnel safety of the maintenance workers since all cables supporting these pumps are in close proximity to each other.

The increase in the "at power" risk is calculated by determining the risk with CCW Pump 2-3 being OOS for 144 hours, in comparison with the no-maintenance "at power" risk. The increase in the "at power" CDF (The incremental conditional core damage probability (ICCDP)) is estimated as:

$$\Delta\text{CDF} = \text{ICCDP} = (\text{CDF}_{\text{CCW2-3}} - \text{CDF}_{\text{NM}}) * 6/365$$

Where $\text{CDF}_{\text{CCW2-3}}$ is the CDF for the proposed cable installation and CDF_{NM} is the no-maintenance CDF.

$$\Delta\text{CDF} = (5.12\text{E-}5 - 3.85\text{E-}5) * 6/365 = 2.09\text{E-}7$$

Based on the comparison of the ICCDP with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific Risk-Informed Decision Making: Technical Specifications," the value obtained for the ICCDP (2.09E-07) demonstrates that the proposed repair completion time change has only a small quantitative impact (below the threshold of 5.0E-07 ICCDP per RG 1.177) on plant risk.

The results were then compared with the risk-significance guidance contained in

RG 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," for changes in the annual average Δ CDF. Since the additional completion time increase is expected to be a one-time occurrence, the ICCDP also represents the increase in risk on a yearly basis. Therefore, the change in annual risk is in Region III (very small risk) of the NRC's CDF acceptance guidelines in Figure 3 of RG 1.174 (less than 1.0×10^{-6} delta CDF). The planned compensatory measures identified in Section 7 serve to further reduce the risk of continued power operation.

To calculate the overall "at power" risk while CCW 2-3 is OOS for 144 hours, three separate configurations are considered:

- CCW Pump 2-3 OOS
- The combination of CCW Pump 2-3 and AFW Pump 2-1 OOS
- CCW Pump 2-3 OOS, with SI Pump 2-2 and RHR Pump 2-2 de-energized to ensure personnel safety of the maintenance workers.

The risk estimates for the entire time the CCW Pump 2-3 will be OOS is calculated as follows:

OOS Configuration	Duration	ICCDP
CCW Pump 2-3	79 hours	$(5.12E-5 - 3.85E-5) * 79/8760 = 1.15E-7$
CCW Pump 2-3 and AFW Pump 2-1	13 hours	$(7.52E-5 - 3.85E-5) * 13/8760 = 5.45E-8$
CCW Pump 2-3, SI Pump 2-2, and RHR Pump 2-2	52 hours	$(5.38E-5 - 3.85E-5) * 52/8760 = 9.08E-8$
Total	144 hours	2.60E-7

Based on the above results, it is noted that the overall risk is not significantly sensitive to small changes in duration of each one of the configurations. Therefore there is flexibility in duration for each of the above configurations.

AFW Pump 2-1 was cleared briefly for planned maintenance on August 20, 2002, but has since been returned to service.

The very small change in risk associated with the inoperable CCW Pump 2-3 must be balanced against the risk associated with the alternative of shutting down the plant to carry out the repairs. There are risks associated with manually

shutting down the unit from a stable condition, including both the risk during the power and mode transition period and the risk while shutdown. These risks are due to challenging systems that are currently in standby and which require support of the CCW system during shutdown. Additionally, to implement one of the proposed personnel safety measures (i.e., de-energize RHR Pump 2-2), one of the main components used for the decay heat removal would be made unavailable. Placing the unit in a cold shutdown condition will increase the heat load on the CCW system, at the same time that one of the CCW pumps is inoperable. Therefore, it is judged that the relative safety significance of the proposed enforcement discretion is low and the potential consequences of the proposed request are preferable to the potential consequences associated with transitioning to and maintaining unit shutdown.

It should be noted that the proposed increase in the CCW Pump 2-3 Completion Time has a negligible impact on the large early release frequency (LERF) since LERF is dominated by the steam generator tube rupture initiating event, which would not be significantly impacted by the proposed increase in the completion time.

Based on the above evaluation and the planned compensatory measures identified in Section 7, PG&E believes that the proposed enforcement discretion does not involve a net increase in radiological risk and that the granting of enforcement discretion will not be a potential detriment to the health and safety of the public.

4. THE JUSTIFICATION FOR THE DURATION OF THE NONCOMPLIANCE

The schedule for the installation of the replacement CCW Pump 2-3 motor feeder cable indicates that approximately 144 hours will be required to complete the repair and post-maintenance testing work assuming all work proceeds as planned including approximately 14 hours of contingency time to accommodate unanticipated problems with cable installation. This schedule will exceed the CCW loop 72-hour Completion Time by 72 hours. The schedule is based on work proceeding around the clock until CCW Pump 2-3 is returned to operable status to minimize the duration of exceeding the completion time. The activities in this evolution are not performed frequently and therefore may require additional time to assure they are completed correctly.

5. BASIS FOR THE LICENSEE'S CONCLUSION THAT THE NONCOMPLIANCE WILL NOT BE OF POTENTIAL DETRIMENT TO THE PUBLIC HEALTH AND SAFETY AND THAT NO SIGNIFICANT HAZARD CONSIDERATION IS INVOLVED

PG&E has evaluated this request for enforcement discretion against the criteria set forth in 10 CFR 50.92, and concludes that the request involves no significant hazards consideration.

"The commission may make a final determination, pursuant to the procedures in paragraph 50.91, that a proposed amendment to an operating license for a facility licensed under paragraph 50.21(b) or paragraph 50.22 or for a testing facility involves no significant hazards considerations, if operation of the facility in accordance with the proposed amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or*
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or*
- (3) Involve a significant reduction in a margin of safety."*

The evaluation is provided below.

- (1) Does the change involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?*

The requested action does not physically alter any plant structures, systems, or components, and does not affect or create new accident initiators or precursors. The CCW system is required to mitigate the consequences of accidents previously evaluated in the Final Safety Analysis Report Update and is not an accident initiator.

PG&E believes there is no net increase in radiological risk associated with extending the 72-hour allowed Completion Time by 72 hours when compared to the risk associated with a plant shutdown.

Since only one loop of CCW is affected by the requested action and single failure is not considered while a plant is in a limiting condition for operation ACTION, the operable redundant vital CCW loop is capable of performing its required function and to maintain the plant design basis. Therefore, the requested action will not alter the assumptions relative to the mitigation of an accident or transient.

The requested action does not affect the types or amounts of radionuclides released following an accident, or the initiation and duration of their release.

Therefore, the probability of occurrence or the consequences of accidents previously evaluated are not significantly increased.

- (2) *Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?*

Extending the 72-hour allowed Completion Time by 72 hours does not introduce new failure modes or mechanisms associated with plant operation. Furthermore, the additional 72-hour period associated with the restoration of the Unit 2 vital CCW loop would not create a new accident type.

Therefore, the change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

- (3) *Does the change involve a significant reduction in a margin of safety?*

The applicable margin of safety is associated with the period of time that the Unit 2 vital CCW loop is inoperable. PG&E believes there is no net increase in radiological risk associated with extending the 72-hour allowed Completion Time by 72 hours when compared to the risk associated with a plant shutdown. Although the proposed action deviates from a requirement in TS 3.7.7, it does not affect any safety limits, other operational parameters, or setpoints in the TS, nor does it affect any margins assumed in the accident analyses. The redundant vital CCW loop is operable and therefore able to perform its required design function. Therefore, the proposed action does not significantly reduce the margin of safety.

In conclusion, based on the above evaluations, the compensatory actions to be taken, and the risk assessment performed, PG&E believes that the activities associated with this request for enforcement discretion do not present a potential detriment to public health and safety, nor is a significant hazards consideration involved.

6. THE BASIS FOR THE LICENSEE'S CONCLUSION THAT THE
NONCOMPLIANCE WILL NOT INVOLVE ADVERSE CONSEQUENCES
TO THE ENVIRONMENT

PG&E has evaluated the requested enforcement discretion request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21, and determined the request does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any

effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the request meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the request for enforcement discretion is not required.

7. ANY PROPOSED COMPENSATORY MEASURES

During the repair of CCW Pump 2-3, the following compensatory measures have been or will be taken to provide additional assurance that the public health and safety will not be adversely affected by this request for enforcement discretion:

- "* No other planned maintenance or testing will be performed that would render the CCW system in Unit 2 or associated support systems inoperable.
- "* All Unit 2 ESF equipment, except for RHR Pump 2-2 and SI Pump 2-2, will be maintained operable. Operators will be assigned by position to restore equipment if an SI signal occurs and the operable RHR and SI pump do not start.
- " In order to maximize the stability of the offsite grid, power level of Units 1, 2, and 3 will not be voluntarily reduced.
- "* Elective maintenance and testing on risk significant equipment will not be performed. For instance, cleaning of the offsite power insulator banks has been deferred (the st8BT49 T
- "* Testing that has a potential for tripping the units will not be performed.
- "* The curtailment of Unit 1, planned for

8. A STATEMENT THAT THE REQUEST HAS BEEN APPROVED BY THE FACILITY ORGANIZATION THAT NORMALLY REVIEWS SAFETY ISSUES

This request for enforcement discretion and its basis have been reviewed and approved by the Plant Staff Review Committee.

9. THE REQUEST MUST SPECIFICALLY ADDRESS WHICH OF THE NOTICE OF ENFORCEMENT DISCRETION (NOED) CRITERIA FOR APPROPRIATE PLANT CONDITIONS SPECIFIED IN SECTION B IS SATISFIED AND HOW IT IS SATISFIED

PG&E has evaluated the requested enforcement discretion against the criteria specified in Section B.2.1.1.a of NRC Inspection Manual Chapter 9900. This NOED request is for an operating plant, and is intended to avoid an undesirable transient that would result from forcing compliance with the license condition, therefore minimizing potential safety consequences and operational risks, or eliminate testing, inspection, or system realignment that is inappropriate for the particular plant conditions.

Unit 2 is currently operating in Mode 1 at approximately 100 percent power. Extension of the TS action Completion Time to allow completion of the repairs to CCW Pump 2-3 and return of the pump to operable status has no net increase in radiological risk and would avoid a shutdown of the unit as required by TS 3.7.7.

10. IF A FOLLOWUP LICENSE AMENDMENT IS REQUIRED, THE WRITTEN NOED REQUEST MUST INCLUDE MARKED-UP TS PAGES SHOWING PROPOSED CHANGES

No TS changes are required.

11. DISCUSSION OF CIRCUMSTANCES INVOLVING SEVERE WEATHER OR OTHER NATURAL EVENTS

The requested enforcement discretion does not involve severe weather or other natural events.