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RECIP. NAME CALLAN, L.J. RECIPIENT AFFILIATION Region 4 (Post 820201)

SUBJECT: Requests enforcement discretion re compliance w/TSS 3/4.3.1, "Reactor Trip Sys Instrumentation," & 3/4.3.2, "Engineered Safety Features Actuation Sys Instrumentation."

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Warren H. Fujimoto
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Operations and Plant Manager

February 2, 1995



PG&E Letter No. DCL-95-025

L. J. Callan, Regional Administrator
U.S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2

Request for Enforcement Discretion Regarding Compliance
with Technical Specification 3/4.3.1, "Reactor Trip System Instrumentation," and
3/4.3.2, "Engineered Safety Features Actuation System Instrumentation."

Dear Mr. Callan:

Pursuant to 10 CFR Part 2, Appendix C, PG&E requests the NRC to exercise enforcement discretion regarding compliance with Technical Specification (TS) 3/4.3.1, "Reactor Trip System Instrumentation," and 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation." The request is made to allow continued operation with one train of the solid state protection system (SSPS) to be inoperable for longer than the 6 hours allowed by TS 3/4.3.2. The enforcement discretion would also allow each reactor trip breaker to be bypassed for maintenance for longer than the 2 hours allowed by action statement 10 of TS 3/4.3.1.

On February 1, 1995, at 1025 PST, PG&E determined that a high energy line break (HELB) could result in the failure of the SSPS. The occurrence of the HELB coincident with a single active failure of the other SSPS train would result in both trains of SSPS not being available to mitigate the consequences of the HELB.

A design change will be implemented to provide electrical separation between the class II circuitry and the class I SSPS power supplies. Following approval of the design change, one maintenance crew will be trained on implementation of the design change in the SSPS mock-up at DCP. This crew will be responsible for the implementation of the design change. Following training, the crew will implement the design change on one unit. Post modification testing will then be required to verify correct implementation of the design change. To allow work to be performed on only one train of the SSPS at a time, enforcement discretion

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February 2, 1994
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from the above TS requirements is required to complete the design change and associated post modification testing, not to exceed 1200 PST on February 5, 1995.

The preliminary root cause of this condition was that the original HELB analysis for the Turbine Building did not identify the potential failure effect of the unisolated class II channels on the safety-related class I SSPS logic power supplies. PG&E will initiate further investigation to finalize the root cause evaluation, determine corrective actions to prevent recurrence, including evaluating other generic aspects and determine the safety significance of the condition, including other initiating events. In order to complete a detailed understanding of the safety significance of other events, including other piping configurations an extensive engineering evaluation would have been required. PG&E determined that the more prudent action would be to request the enforcement discretion to correct the identified deficiencies rather than delaying the corrective actions in order to complete the required engineering evaluations.

The justification for the duration of the request, the compensatory measures, the safety evaluation and an evaluation of the potential impact on the public health and safety and the environment are enclosed.

Sincerely,



Warren H. Fujimoto

cc: Edward T. Baker
Mary H. Miller
Kenneth L. Perkins
Diablo Distribution
Document Control Desk



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ENCLOSURE

REQUEST FOR ENFORCEMENT DISCRETION REGARDING COMPLIANCE WITH TECHNICAL SPECIFICATION 3/4.3.1, "REACTOR TRIP SYSTEM INSTRUMENTATION," AND 3/4.3.2, "ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION"

A. INTRODUCTION

On February 1, 1995, PG&E determined that a main steam line break (MSLB) in the Turbine Building could result in failure of one train of the solid state protection system (SSPS). A double-ended guillotine break of a main steam line is postulated to occur at the turbine stop valve on the 140 foot elevation of the Turbine Building. This could result in the steam jet from the faulted main steam line striking electrical terminal boxes. However, only one electrical terminal box, and consequently only one train of SSPS, would be rendered inoperable by a given MSLB orientation.

The electrical terminal boxes contain two SSPS instrument channels. These channels are class II inputs to the SSPS and are not electrically isolated from the class I logic power supplies of the SSPS.

If the steam jet from the faulted main steam line were to strike one of the electrical terminal boxes, a force of approximately 20,000 pounds could be applied normal to the surface of the panel. The force would destroy the panel and could potentially cause short circuits in the class II inputs to the SSPS. Since the class II channels are not electrically isolated from the SSPS power supplies, the short could cause the fuses for the SSPS class I power supplies in one train to fail. The failure of the fuses for the class I power supplies would disable the logic circuitry of one train of the SSPS, rendering the train inoperable. If a single active failure of the instrument A.C. bus supplying power to the slave relays of the other SSPS train were to occur, both trains of SSPS would be rendered inoperable. No automatic actuations would be available to mitigate the consequences of the steam line break. However, the reactor would trip upon loss of SSPS.

During the walkdowns, other potential MSLBs in the Turbine Building were identified that could result in short circuits in as many as three class II channels. However, these other MSLBs will still result in the failure of only one SSPS train. The safety evaluation below is applicable to these other postulated scenarios.



Following completion of the review of this condition by the plant staff review committee, both trains of the SSPS for both units were declared inoperable and TS 3.0.3 was entered.

The situation requires enforcement discretion in order to prevent a forced shutdown of Diablo Canyon Power Plant (DCPP) Units 1 and 2. TS 3.0.3 requires that preparations be made to initiate a unit shutdown within 1 hour, and that the unit then be placed in Mode 3 (Hot Standby) within the following 6 hours, in Mode 4 (Hot Shutdown) within the following 6 hours, and in Mode 5 (Cold Shutdown) within the following 24 hours. The situation could not be avoided since the potential failure of the SSPS was only recently identified during a walkdown investigation of a main steam line design criteria question.

At 1125 PST on February 1, 1995, the NRC granted verbal enforcement discretion conditional upon receipt for approval of an acceptable written request within 24 hours and subsequent approval. Upon receipt of verbal approval of the enforcement discretion, PG&E exited TS 3.0.3.

PG&E requested the NRC to exercise enforcement discretion starting at 1125 PST on February 1, 1995, and ending upon implementation of a design change to electrically isolate SSPS direct contact input circuits from the class I SSPS logic power supplies. The implementation and associated post modification testing of the design change will be completed no later than 1200 PST on February 5, 1995.

B. TECHNICAL SPECIFICATION OR OTHER LICENSE CONDITION THAT WILL BE VIOLATED

TS 3.3.2, Table 3.3-3, functional units 1.a, "Safety Injection - Manual Initiation," 1.b, "Safety Injection - Automatic Actuation Logic and Actuation Relays," 2.b, "Containment Spray - Automatic Actuation Logic and Actuation Relays," 3.a.2), "Phase A Isolation - Automatic Actuation Logic and Actuation Relays," 3.b.2), "Phase B Isolation - Automatic Actuation Logic and Actuation Relays," 4.b., "Steam Line Isolation - Automatic Actuation Logic and Actuation Relays," 5.a., "Turbine Trip and Feedwater Isolation - Automatic Actuation Logic and Actuation Relays," and 6.b., "Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays" require that both SSPS logic trains be operable. If one logic train is inoperable, each functional unit has an associated action statement. For all the functional units except 3.c.1), the action statements allow 6 hours to restore the inoperable channel to operable status or place the plant in Mode 3 (Hot Standby) within the following 6 hours.



To perform the required modifications to the class II circuits, the reactor trip breakers will be placed in bypass. TS 3.3.1 allows the reactor trip breakers to be placed in bypass for up to 2 hours. However, each reactor trip breaker will be required to be placed in bypass for up to 6 hours to perform the required modification.

C. CIRCUMSTANCES SURROUNDING THE SITUATION

NUREG-0800, "Standard Review Plan," Sections 3.6.1 and 3.6.2 require that evaluations be performed to verify that HELBs will not render safety-related equipment inoperable that could prevent the plant from being brought to a cold shutdown condition. As part of the HELB evaluations, any equipment rendered inoperable by a HELB must be assumed to be inoperable. Additionally, the single active failure that has the most negative impact on mitigating the consequences of the HELB must be assumed. The evaluation then allows any remaining systems, including those actuated as a result of operator action, to be used to mitigate the consequences of the HELB. Any operator action credited for mitigation must occur in a time reasonable for the operators to perform, and the operators must have access to the required equipment during the HELB. The HELB analyses of safety-related equipment at DCPD were accepted in supplemental safety evaluation reports (SSERs) 6 and 11.

The condition was identified during the investigation of a design criteria question. During the walkdown, the involved engineers questioned whether all targets near the main steam line had been evaluated for high energy line break (HELB) concerns. The results of the subsequent investigation identified that class II SSPS input circuits could be impacted by a main steam line HELB and, thereby, degrade the operability of the SSPS.

The preliminary root cause of this condition was that the original HELB analysis for the Turbine Building did not identify the potential failure effect of the unisolated class II channels on the safety-related class I SSPS logic power supplies. PG&E will initiate a detailed investigation to finalize the root cause evaluation, determine corrective actions to prevent recurrence, including evaluating generic aspects that may be applicable to other safety systems and determine the safety significance of the condition, including other initiating events. In order to complete a detailed understanding of the safety significance of other events, including other piping configurations an extensive engineering evaluation is required. PG&E determine that the more prudent action would be to request the enforcement discretion action to correct the identified deficiencies rather than delaying the corrective actions in order to complete the required engineering evaluations.



D. SAFETY EVALUATION

Background

The SSPS receives input signals from plant sensors. The plant sensors are divided into 4 channels (I, II, III, and IV). Each channel provides input to the SSPS through a separate input bay. In addition, each SSPS input bay is powered from one of the four vital Instrument A.C. busses. Through the input bay, power is supplied to the logic bay and input signals that do not originate from Eagle 21 or the nuclear instrument drawers.

The input from plant sensors is then processed through the logic circuitry of the SSPS to determine required equipment actuations to mitigate the consequences of an accident. After the logic circuitry has processed the input signals, the appropriate signals are then sent to the output bay of the SSPS, where output slave relays actuate the appropriate plant equipment. The relays in the output bay are powered from instrument bus I for train A and instrument bus IV for train B.

Effect of Condition on Safety Function

The failure of the fuses for the logic power supplies in one train of the SSPS would render the train inoperable. If a single active failure renders the other SSPS train inoperable, no automatic equipment actuation would occur to mitigate the consequences of the main steam line break.

Westinghouse Evaluation

Westinghouse has performed an evaluation to determine the results of a MSLB outside containment if the SSPS is inoperable. The evaluation assumed the following:

1. A double-ended rupture of a main steam line resulting in an effective break size of 1.4 square feet per steam generator, which corresponds to the total effective flow area of the flow restrictor in each steam generator.
2. Initial plant conditions of hot zero power to maximize the volume of water in the steam generators and minimize initial stored energy in the RCS.
3. End-of-life reactivity conditions.
4. No decay heat.
5. All rods fully inserted with the exception of the most reactive rod fully withdrawn.
6. No operator action.



7. No automatic equipment actuation with the exception of the passive actuation of the safety injection accumulators.
8. 100% power nominal main feedwater flow.
9. Maximum auxiliary feedwater flow.

These assumptions are consistent with the main steam line break analysis in FSAR Update Chapter 15.

The results of the evaluation indicate that although the reactor does return to power, not only is the DNB design basis met, but the current FSAR licensing basis MSLB core response analyses remain bounding.

Although the cooldown evaluated was greater than that in the design basis MSLB, Westinghouse performed a preliminary evaluation on the effect of the condition on pressurized thermal shock (PTS) and concluded the increased cooldown had no appreciable effect on PTS risk.

Simulator Response/Operator Action

The MSLB with a loss of both SSPS trains and no operator action was modeled on the DCPD simulator. The results of the simulator run indicate no return to power during the MSLB. The plant response from the simulator run was shown to several licensed operators to determine their response to the event. They indicated that they would identify the need for a safety injection and manually align the plant for safety injection within a few minutes after the event given the guidance in the emergency operating procedures. Based on this preliminary review, PG&E believes that this satisfies the criteria in NUREG-0800 previously mentioned for operator action credited in mitigating the HELB in a timely manner. Additionally, operator simulator training includes loss of power supplies and automatic ESF actuation capability.

Probability of Main Steam Line Failure Coincident with SSPS Train Failure

A probabilistic risk assessment (PRA) was performed to estimate the change in core damage frequency during the period that the enforcement discretion is applicable. The PRA conservatively assumed that any steam line break outside containment of any size would fail one train of SSPS and considered the probability that the other train of SSPS could fail independently. Also, the PRA evaluated the risk during the periods when the design change is implemented and one train of SSPS and one reactor trip breaker is removed from service. The total increase in risk is the sum of the risk of being in the degraded plant condition and the risk of implementing the design change while at power. The total increase in risk, for the circumstances described in this enforcement



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discretion, is estimated to be 0.3% (or 2×10^{-7} increase in core damage frequency) of the Internal events annual core damage frequency. According to the NEI Draft "PSA Applications Guide," dated June 10, 1994, a temporary change in core damage frequency of less than 1×10^{-8} is considered to be non-risk significant. Therefore, the incremental risk associated with extending the out of service time is judged to be acceptable.

Corrective Action

To assure that an HELB will not cause short circuits that could result in the failure of a train of the SSPS, a design change will be implemented to electrically isolate the direct contact SSPS inputs from the class I SSPS logic power supplies. Following approval of the design change, one technician crew will be trained on implementation of the design change in the SSPS mock-up at DCPD. This crew will be responsible for the implementation of the design change both of the SSPS in both DCPD units. Following training, the crew will begin to implement the design change on one unit. Post modification testing will then be required to verify correct implementation of the design change.

E. COMPENSATORY MEASURES

The following actions will be taken to provide additional assurance that the public health and safety will not be adversely affected by this enforcement discretion request.

1. The design change will be performed on only one train of the SSPS at any given time. This will provide assurance that at least one train of SSPS on each unit of SSPS would perform its required function to mitigate the consequences of most accidents.
2. Train-related maintenance and surveillance testing will be suspended until the implementation of the design change.
3. High risk plant evolutions will be avoided.
4. An Operations shift order has been prepared describing this condition and the proper implementation of the emergency procedure for responding to a MSLB that affects the SSPS.
5. A unit will not be voluntarily curtailed until the implementation of the design change is completed.



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6. Activities on the 140 foot elevation of the turbine deck that could result in damage to the steam lines (such as movement of loads over the high pressure turbine) will be restricted until implementation of the design change is complete.

F. JUSTIFICATION FOR NONCOMPLIANCE DURATION

As discussed above, approximately 4 days until 1200 PST on February 5, 1995, is required to complete the preparation and approval of a design change to train a technician crew on the implementation of the design change, and to implement and complete post modification testing.

G. UNREVIEWED SAFETY QUESTION AND NO SIGNIFICANT HAZARDS EVALUATION

In accordance with 10 CFR 50.59 and 10 CFR 50.92(c), FG&E's evaluation of the proposed enforcement discretion for an unreviewed safety question and no significant hazards considerations is as follows:

1. The proposed enforcement discretion does not involve a significant increase in the probability or consequences of an accident or malfunction previously evaluated.

The probability of a MSLB accident is not affected by the proposed enforcement discretion.

The only equipment failure potentially affected is failure of a train of SSPS. Failure of the SSPS as the initiating event or failure of an SSPS train following any accident other than a steam line break is unaffected.

Using the NEI Draft "PSA Application Guide," a PRA was performed that indicated the increase in probability resulting from the proposed enforcement discretion was insignificant.

The consequences of a malfunction of the SSPS due to a MSLB in the Turbine Building coincident with a single active failure of one train of the SSPS were evaluated by Westinghouse. The evaluation concluded that the DNBR limits would be satisfied.

Therefore, the request does not involve a significant increase in the probability or consequences of an accident or malfunction previously evaluated.



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2. Does the enforcement discretion create the possibility of a new or different kind of accident from any accident previously evaluated?

A MSLB has been evaluated in the FSAR. The evaluation assumes that at least one train of the SSPS is available to mitigate the consequences of the MSLB. However, the MSLB in the turbine building could render both trains of the SSPS inoperable when a single active failure is considered.

NUREG-0800 allows operator action to be credited in mitigating the consequences of an accident. A PG&E preliminary review of the operator response to the MSLB without SSPS was performed. PG&E believes this review indicates that the operators would be capable of mitigating the consequences of the MSLB in adequate time to prevent core damage.

Westinghouse also performed an evaluation of a MSLB without any SSPS available or operator action. The Westinghouse evaluation concluded that DNBR limits would be satisfied.

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

3. Does the enforcement discretion involve a significant reduction in the margin of safety?

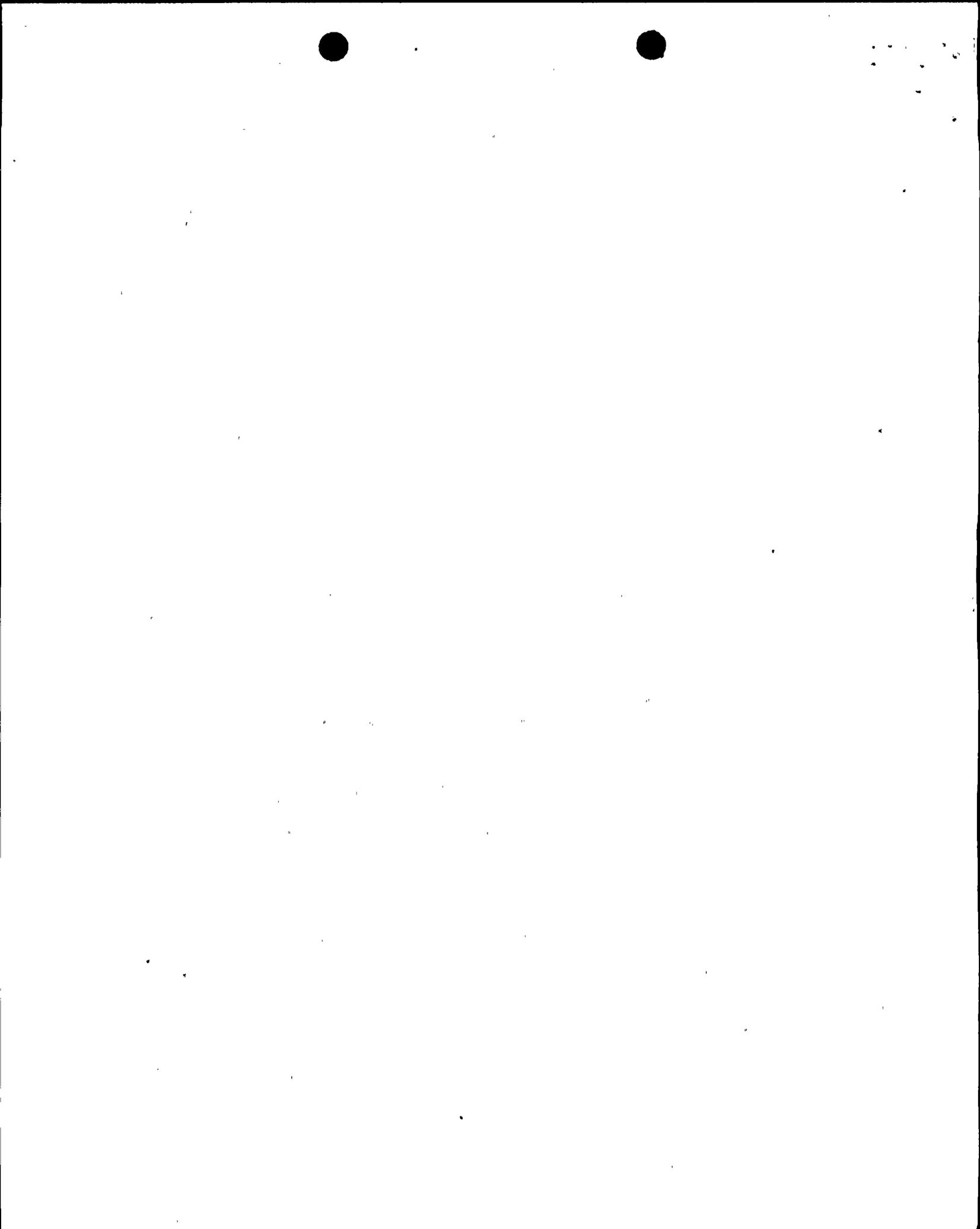
A PRA was performed that determined that the probability of a MSLB that disables one train of SSPS coincident with a single active failure of the other SSPS train during the period of the enforcement discretion was insignificant.

A PG&E preliminary review of the operator response to the MSLB without SSPS demonstrates that the operators would be capable of mitigating the consequences of the MSLB in adequate time to prevent core damage.

Westinghouse also performed an evaluation of a MSLB without any SSPS available or operator action. The Westinghouse evaluation concluded that DNBR limits would be satisfied.

Therefore, the enforcement discretion does not involve a significant reduction in the margin of safety.

In conclusion, based on the above safety evaluation, PG&E believes that the activities associated with this enforcement discretion request satisfy the requirements of 10 CFR 50.59 and 10 CFR 50.92(c). Accordingly, a



no significant hazards consideration finding is justified and no unreviewed safety question exists.

H. ENVIRONMENTAL EVALUATION

PG&E has evaluated the proposed request for enforcement discretion 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.

I. PLANT STAFF REVIEW COMMITTEE APPROVAL

The request for enforcement discretion and its basis were reviewed by the PG&E Plant Staff Review Committee (PSRC) prior to the request being made to the NRC. The PSRC also reviewed and concurred with this written request.

