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PG&E Letter DCL 00-131

U.S. Nuclear Regulatory Commission
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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 Concerning Revision of Commitment Regarding NUREG-0737 and Regulatory Guide 1.97, Revision 3, Guidance for Soluble Boron Concentration Monitoring

Dear Commissioners and Staff:

In a telephone call on September 15, 2000, and a letter dated September 22, 2000, the NRC staff identified additional information required in order to complete its evaluation of PG&E's request to revise a commitment regarding soluble boron concentration monitoring in accordance with NUREG-0737 and Regulatory Guide 1.97, Revision 3. PG&E's response to the request for additional information is enclosed.

If you have any questions regarding this response, please contact Mr. James Radford at (805) 545-3664.

Sincerely,

Lawrence F. Womack

cc: Edgar Bailey, DHS
Ellis W. Merschoff
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Enclosure

A001

# RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION CONCERNING REVISION OF COMMITMENT REGARDING NUREG-0737 AND REGULATORY GUIDE 1.97, REVISION 3, GUIDANCE FOR SOLUBLE BORON CONCENTRATION MONITORING

## I. Background

In PG&E Letter DCL-99-148, "Revision of Commitment Regarding NUREG-0737 and Regulatory Guide 1.97, Revision 3, Guidance for Soluble Boron Concentration Monitoring," dated November 12, 1999, PG&E requested approval to revise a commitment regarding guidance provided by NUREG-0737 and Regulatory Guide (RG) 1.97, Revision 3, for monitoring reactor coolant system (RCS) soluble boron concentration at Diablo Canyon Power Plant (DCPP). Specifically, PG&E proposed abandoning the boron concentration monitoring system (BCMS), and utilizing the post accident sampling system (PASS) for measuring RCS soluble boron concentration following an accident.

In a telephone call on September 15, 2000, the NRC staff requested that PG&E provide a short description of the three systems used at DCPP for sampling RCS boron concentration. In addition, in a letter dated September 22, 2000, the NRC staff identified four items of information required to complete its evaluation of PG&E's request. The requested information is provided below.

## II. System Descriptions

### BCMS

Each unit at DCPP is equipped with an in-line boron concentration monitor (analyzer) for continuous boron analysis. The analyzer is located on the 100 ft. elevation of the auxiliary building with indication provided in the control room. It takes a continuous sample from letdown flow within the chemical and volume control system, downstream of the letdown demineralizers. The sample stream flows through tubing routed between a neutron source and neutron detector inside a shielded tank. The detector provides no alarms. The analyzer isolates from the RCS when letdown isolates during an accident. Thus BCMS is not normally available under severe accident conditions. The instrument range is 0 ppm to 5000 ppm.

### Primary Sample Sink

Each unit at DCPP is equipped with a hooded primary sample sink located on the 100 ft. elevation of the auxiliary building. The sample sink room is shielded and vented for normal operations, but may not be accessible under accident conditions. Routine RCS boron grab samples are obtained at this location for analysis to satisfy Technical Specification (TS) Surveillance Requirements

3.1.1.1 and 3.9.1.1. The grab samples are taken to the primary chemistry lab on the 85 ft. elevation for analysis. The analysis range is 5 ppm to 8000 ppm.

PASS

Each unit at DCPP is equipped with a shielded PASS room located on the 85 ft. elevation of the auxiliary building. The PASS system is accessible under accident conditions. Diluted (1000:1) RCS and residual heat removal system boron grab samples can be obtained to meet the postaccident boron sampling requirements of NUREG-0737 and RG 1.97. The analysis range is 0 ppm to 6000 ppm.

## III. Responses to NRC Questions

### NRC Question 1

*Page 7.7-19 of the submittal states the following:*

> *The boron concentration measurement system provides continuous monitoring of the reactor coolant boron concentration. Therefore, adjustments of boron concentration in the reactor coolant can be monitored as they are being made. Further, the plant operators can monitor boron concentration directly. There is no time lapse or personnel requirement for collection and laboratory analysis of reactor coolant samples, nor is there any waste material to be processed.*

*This paragraph alludes to the use of the boron concentration monitoring system (BCMS) in place of "grab samples". How was this information used? How will this function be met upon elimination of BCMS?*

### PG&E Response to Question 1

The BCMS was intended to be used as an operator aid to provide a method to track boron concentration changes between grab samples. While it has been used to follow trends, it has not been reliable or accurate. There are other continuous indications available to the operators that will respond to changes in boron concentration. For instance, in the event of unplanned boration or dilution events, changes will occur in reactor coolant system temperature (at power) or count rate (when subcritical). These indications will continue to be available after elimination of the BCMS.

Note that Page 7.7-18 of the submittal states;

> "The boron concentration measurement system is designed for use as

an advisory system. It is not designed as an engineered safety features (ESF) system or a component of an ESF system. The boron concentration measurement system is not part of a control element or control system, nor is it designed for this use. No credit is taken for this system in any accident analysis. Therefore, redundancies of measurement components, self-checking subsystems, malfunction annunciations, and diagnostic circuitry are not included in this system. As a general operating aid, it provides information as to when additional check analyses are warranted, rather than a basis for fundamental operating decisions."

The use of the BCMS as an advisory system, or general operating aid, has proven to be unneeded based on operator experience. Because the system is not needed, and because it is not reliable or accurate, the resources required to keep it operational are not warranted.

NRC Question 2

*If the post accident sampling system (PASS) system has been capable of meeting the requirements of NUREG-0737 and RG 1.97, Revision 3, why were both systems credited initially?*

PG&E Response to NRC Question 2

A review of licensing correspondence has not identified the reason both systems were credited initially. It is believed that they were both credited because neither BCMS nor PASS meets all of the specifications of RG 1.97, but together, they do. RG 1.97, Revision 3, Table 1, Section 6, "Display and Recording," states that for Category 3 instrumentation (which applies to boron concentration monitoring) the "instrumentation signal may be displayed on an individual instrument or it may be processed for display on demand." BCMS meets this specification because it provides continuous indication, while PASS does not. Also, the BCMS indication range of 0-5000 ppm does not meet the indication range specified by RG 1.97 of 0-6000 ppm, but PASS does. Finally, in an accident in which letdown isolates, which would occur in most major accidents, BCMS would not be available, and PASS would be used instead.

Although the combination of the BCMS and PASS met all RG 1.97 requirements, the acceptability of using PASS to meet RG 1.97 requirements was evaluated in Supplemental Safety Evaluation Report (SSER) No.31, dated April 1985. SSER 31 concluded that PG&E either conforms to, or is justified in deviating from the guidance of RG 1.97 for each postaccident monitoring variable. Therefore, although the PASS does not meet all the requirements of RG 1.97, it was determined to be acceptable. Also, a review of licensing documentation, including SSERs and the DCPP Updated Final Safety Analysis Report, identified

no requirements or commitments that the BCMS is to be credited for meeting any PASS deviations.

NRC Question 3

*Elimination of the use of BCMS for monitoring boron concentration in the reactor coolant system (RCS) and reliance for this function on PASS will require the continued maintenance of PASS. Based on the response for Question 1, will PASS be relied on for all functions previously performed by BCMS?*

PG&E Response to NRC Question 3

Elimination of the BCMS will not require PASS to be used for continuous boron concentration monitoring. Continuous boron concentration monitoring is not a TS or licensing requirement, and is not needed for plant operation. Routine sampling and analysis will continue to be performed by taking grab samples at the primary sample station and analyzing them in the primary chemistry lab.

Elimination of the BCMS will require continued maintenance of PASS to meet the postaccident boron sampling requirements of RG 1.97, at least for the short term. In the long term, PG&E intends to pursue elimination of PASS. WCAP-14986-A, Revision 2, "Westinghouse Owners Group Post Accident Sampling System Requirements: A Technical Basis," was issued on August 7, 2000. It incorporates the NRC Safety Evaluation Report dated June 14, 2000, and concludes that sampling for RCS soluble boron concentration is not necessary following an accident. PG&E is a member of an industry consortium of five plants known as Strategic Teaming and Resource Sharing (STARS). The STARS group consists of the five plants operated by Wolf Creek Nuclear Operating Corporation, TXU Electric, AmerenUE, PG&E, and South Texas Project Nuclear Operating Company. Through the STARS cooperative effort, PG&E is participating in licensing efforts to eliminate PASS, with Wolf Creek as the lead plant. Until PG&E obtains a license amendment to eliminate PASS, it will continue to use PASS to meet the requirements to measure soluble boron concentration following an accident.

NRC Question 4

*By what means is the RCS boron concentration currently measured to ensure adequate shut down margin?*

PG&E Response to NRC Question 4

Grab samples are taken and analyzed for boron concentration to ensure adequate shutdown margin is maintained as required by TS 3.1.1, "SHUTDOWN MARGIN (SDM)."