



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

February 14, 2005

Mr. Harry A. Freeman
Senior Allegation Coordinator
U.S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

SUBJECT: DIABLO CANYON REACTIVITY INCIDENT

Dear Mr. Freeman:

I read your letter dated February 8, 2005, to Ms. Rochelle Becker of the Mothers For Peace about the subject incident that occurred on June 21, 2004, at the Diablo Canyon nuclear plant. I also read the NRC inspection report dated August 12, 2004 (ML042250352) referenced in your letter. Your letter concludes with guidance to contact you with any additional questions. I have additional questions and am contacting you hoping for additional answers.

Page 2 of your response to Ms. Becker states:

Reactor operators are supposed to have procedures in hand to borate/dilute. In addition, there is an operator aid directly on the panel that spells out each of these steps. The licensee has placed several barriers in place to prevent these types of reactivity events, and yet all these barriers failed and the operators missed a step in the borate/dilution procedure. Thus, licensee management felt that personal accountability was necessary, given that they have already erected several barriers.

Page 1 of your response stated:

Operators had been reducing the boric acid concentration in the primary system in order to continue the power increase. Because they were about to perform a shift turnover, they decided to back out of the dilution procedure about half way through. In backing out of the procedure, the operators missed the step that closes the valve going to the top of the volume control tank.

UCS Question No. 1: Did the operating procedure being used to dilute the boron concentration of the reactor coolant system water specifically provide guidance on “backing out” of it or were the operators “winging it?”

UCS Question No. 2: If the procedure did not describe how to “back out,” were the operators held accountable because they failed to follow procedures or because they didn’t “wing it” well enough?

My seventeen-plus years of working in the nuclear industry prior to joining UCS provided me a healthy respect for verbatim compliance with procedures and personal accountability. Neither the inspection report nor your response gives me sufficient basis to conclude whether the operators were scapegoats or goats. The answers to the first two questions will hopefully provide that distinction.

The NRC inspection report is filled with accounts of human performance problems at Diablo Canyon. Citing but a few of the many accounts:

On March 23, 2004, Unit 1 operators failed to comply with the outage safety plan. The outage safety plan required level in at least two SGs to be greater than 15 percent in Mode 5 with loops filled, as a backup method of decay heat removal. Because of inadequate knowledge of the outage safety plan, operators allowed all four Unit 1 SG levels to decrease below 15 percent, while performing other evolutions. [page 13]

A self-revealing violation of 10 CFR Part 50, Appendix B, Criterion V was reviewed for failure to provide a procedure appropriate to the circumstances. ... On March 26, 2004, while draining water from the reactor coolant system, to partially drain the reactor vessel, an inadvertent sudden increase of 2 feet in vessel level occurred. PG&E concluded that this sudden change was caused by draining the vessel head unvented, and subsequently opening the valves after significant drain down. [page 16]

The inspectors followed up on an event that occurred on March 27, 2004. Water was inadvertently added to the upper reactor cavity with the intent of filling the lower reactor cavity. Operators marked up sections of Procedure OP B-2:11 "RHR – Filling the Refueling Cavity," Revision 31, to perform a fill of the lower cavity. However, operators used the incorrect section of the procedure and inadvertently gravity filled the upper reactor cavity from the refueling water storage tank. This path can result in splashing as the water flows to the lower reactor cavity. [pages 12-13]

Following the above event [March 26th unvented drain down] and others described in Sections IR14.1, .2, .3, and .4 that included inadvertent losses of control of system status by operations leadership, the operations director initiated an operations stand down with the senior reactor operators and day shift plant operations staff. Emphasis was placed on understanding plant conditions and maintaining the "big picture" rather than concentrating on performance of individual procedure steps. [page 17]

On April 4, 2004, operators inadvertently transferred 13,000 gallons of water from the refueling water storage tank to the Unit 1 spent fuel pool. Operators performed two evolutions simultaneously that were not compatible for the plant conditions. [page 13]

On May 11, 2004, operators were drawing a pressurizer steam bubble in accordance with Procedure OP A-2:IX Section 6.42. During this evolution, pressurizer level dropped so operators began charging into the reactor coolant system to recover pressurizer level. This charging of cold water caused the pressurizer to cool down. Thus operators energized all pressurizer heaters for a maximum heat up. These two evolutions made control of pressurizer parameters challenging. In addition, operators were monitoring an out of service pressurizer pressure channel, while drawing the bubble. Pressure Transmitters PT-403 and -405 were cleared, but no out of service tags had been hung on the transmitters. Thus, pressurizer pressure parameters appeared to be stable when using the out of service instruments. The inadequate control of plant evolutions and parameters resulted in an excessive heat up rate. [page 18]

Thus, operators at Diablo Canyon had problems entering, conducting, and exiting the spring refueling outage on Unit 1. Those problems involved many of the very same factors present in the June 21st event that was the subject of Ms. Becker's initial concerns.

On the second page of your response to Ms. Becker, you stated:

However, specifics of personal actions taken by the licensee was not reviewed by the resident inspectors and is not an area where the NRC typically had regulatory jurisdiction. The NRC did not assess the licensee's actions in this area.

UCS Question No. 3: Given that the June 21st event happened when operators attempted to reduce boric acid concentration concurrently with monitoring main condenser and tunnel cleaning activities and the March 23rd and April 4th events also involved operator miscues while performing a multitude of concurrent tasks, doesn't the evidence suggest that the licensee has not successfully implemented corrective actions to prevent (or even slow down the frequency) of this recurring problem?

UCS Question No. 4: Given that the operations director initiated a stand down at Diablo Canyon after the March 26th event to emphasize to the operators the need for "maintaining the 'big picture' rather than concentrating on performance of individual procedure steps," isn't it possible that the 'big picture' of wrapping things up on June 21st prevented the operators from concentrating on the performance of individual procedure steps (including the step they allegedly missed?)

UCS Question No. 5: The March 26th vessel drain down event involved a violation caused by the operators following a procedure exactly as it was written (i.e., bad procedure), the March 27th inadvertent filling of the upper reactor cavity event was caused by the operators following the wrong section of a procedure exactly as it was written (i.e., good procedure, wrong section), and the June 21st event was caused by the operators not following a procedure as it was written (i.e., good procedure).

- a) **Is it fair for the licensee to sanction only those operators who miss a single step in a procedure and not to sanction those operators who wrongly perform an entire section of a procedure?**
- b) **Is it fair for the licensee to sanction only those operators who miss a single step in a procedure and not to sanction those individuals who write and approve a bad procedure that causes a violation when operators follow it verbatim?**
- c) **Does the inequitable imposition of sanctions (a.k.a. arbitrary and capricious punishment) promote a safety conscious work environment, or does it instill a sense of covering up mistakes out of fear that management's "wheel of misfortune" might cost one a career?**

It is not at all clear from the NRC inspection report that the sanctions imposed on the operators involved in the June 21st event are an appropriate solution to the human performance problems at Diablo Canyon. Instead, that report strongly suggests that the operators are being set up to fail. They are equipped with bad procedures. They are tasked with many non-routine tasks to perform concurrently. They are held accountable when they fail to overcome these hindrances.

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Your letter stated that PG&E “management felt that personal accountability was necessary.” I agree. The NRC must be the mirror that PG&E management apparently lacks.

Sincerely,

A handwritten signature in black ink that reads "David O. Lochbaum". The signature is written in a cursive, flowing style.

David Lochbaum
Nuclear Safety Engineer
Union of Concerned Scientists
1707 H Street NW, Suite 600
Washington, DC 20006
(202) 223-6133

cc: Rochelle Becker