ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9402180039 DOC.DATE: 94/02/11 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: Responds to NRC 931206 RAI re ASME Section III RR For Positive Displacement Pump Block Valve.

DISTRIBUTION CODE: A047D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
TITLE: OR Submittal: Inservice/Testing/Relief from ASME Code

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PDV LA	1	0	PDV PD	1	1
	PETERSON,S	2	2			
INTERNAL:	ACRS	6	6	AEOD/DSP/ROAB	1	1
	NRR/DE/EMEB	1	1	NRR/EMCB	1	1
	NUDOCS-ABSTRACT	1	1	OC/LEDCB	1	0
	OGC/HDS1	1	0	REG FILE 01	1	1
	RES/DSIR/EIB	1	1			
EXTERNAL:	EG&G BROWN,B	1	1	EG&G RANSOME,C	1	1
	NRC PDR	1	1	NSIC	1	1

R I D S / A D D S

R I D S / A D D S

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 22 ENCL 19

Pacific Gas and Electric Company

77 Beale Street, Room 1451
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

February 11, 1994

PG&E Letter No. DCL-94-030

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

Re: 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 - ASME Section III Relief Request for Positive Displacement Pump Block Valve

Gentlemen:

NRC letter dated December 6, 1993, requested additional information regarding PG&E's requested relief from ASME Code Section III, Subsection NC-7142, for a block valve installed downstream of a relief valve for the positive displacement pump. PG&E's request was submitted in Letter DCL-93-084, dated April 13, 1993, and was approved on an interim basis in an NRC letter dated April 15, 1993, until an in-depth review was completed by the NRC. Enclosed is PG&E's response to the NRC's request for additional information.

Sincerely,

Gregory M. Rueger

cc: Mary H. Miller
Kenneth E. Perkins
Sheri R. Peterson
Diablo Distribution

Enclosure

6334S/JHA/469

150020

A047

ENCLOSURE

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION - ASME SECTION III RELIEF REQUEST FOR POSITIVE DISPLACEMENT PUMP BLOCK VALVE

NRC letter dated December 6, 1993, requested additional information regarding PG&E's requested relief from ASME Code Section III, Subsection NC-7142, for block valve 831 that is installed downstream of a relief valve for the positive displacement pump (PDP). PG&E's request was submitted in Letter DCL-93-084, dated April 13, 1993, and was approved on an interim basis in NRC letter dated April 15, 1993, until an in-depth review was completed by the NRC Staff. The NRC's request for additional information and PG&E's response are provided below.

NRC Request

"In the submittal dated April 13, 1993, the licensee states that the Chemical and Volume Control System (CVCS) positive displacement pump (PDP) is required for the following two functions:

- for boration flow path as required by Technical Specification (T/S) 3.1.2.3 and 3.1.2.4

- for post-fire safe shutdown to meet 10 CFR 50, Appendix R requirements.

The submittal also postulates that if block valve 831 (CVCS-1-831 and CVCS-2-831) is inadvertently closed, the bonnet of drain valve 54 or the discharge flange of RV-8116 would deform to effectively relieve system pressure. However, it is noted that with block valve 831 closed, backpressure at the relief valve discharge, either present due to a small leak through the relief valve or built up as the relief valve begins to open, could cause the relief valve not to open at all or immediately reseat. This could prevent the discharge line from being pressurized as postulated such that excessive system pressure would not be relieved. Even if the relief valve design is such that the backpressure would not cause the relief valve to remain closed or immediately reseat, the valve response time could be adversely affected. Since the pressurization rate from the PDP discharge can be very large if the system is completely isolated, it would appear that this could result in the rupture of the piping on the inlet side of the relief valve rather than the outlet side which would then effectively disable the PDP. Therefore, the inadvertent closure of block valve 831 could result in the inability of the PDP to perform the above safety functions.

1. Please describe the above safety functions in more detail including how important they are to plant safety.

2. Please provide information about any alternative capability to perform these functions in the event the PDP is inoperable."

PG&E Response

A description of the safety functions of the positive displacement pump (PDP) is provided below in more detail than was provided in Letter DCL-93-084, dated April 13, 1993, including information about any alternative capability to perform these functions in the event the PDP is inoperable. We are also providing additional information regarding (1) backpressure considerations based on inadvertent closure of block valve 831, and (2) operational and administrative controls that ensure that PDP discharge isolation valve 830 and block valve 831 are maintained open when the PDP is required to be operable.

Emergency Boration Safety Function

Each unit at Diablo Canyon Power Plant has three charging pumps: one PDP and two centrifugal charging pumps (CCPs). The primary function of the PDP is to provide normal charging to the reactor coolant system (RCS) for the purpose of pressurizer level control, and PG&E's operating philosophy is to run the PDP continuously to perform this non-safety function. The primary function of the CCPs is to provide high head safety injection/emergency core cooling. In addition, all three charging pumps can be relied upon for emergency boration.

There are several Technical Specifications (TS) relevant to the charging pumps with respect to emergency boration and emergency core cooling safety functions:

- In plant Modes 1, 2, and 3: (a) TS 3.1.2.4 requires two (of three) charging pumps to be operable for emergency boration, and (b) TS 3.5.2 requires both CCPs to be operable for high head safety injection/emergency core cooling. As a result of the TS 3.5.2 operability requirements, the CCPs can also be relied upon as the primary pumps to meet the TS 3.1.2.4 emergency boration requirement in plant Modes 1, 2, and 3. In accordance with Equipment Control Guideline (ECG) 8.1, "Chemical and Volume Control System - Positive Displacement Pump," the PDP is required to be operable in plant Modes 1, 2, and 3 for Appendix R fire protection (see discussion under "Fire Protection Safety Function") and, therefore, will be available for emergency boration. (Note: Although the PDP has no emergency core cooling function, its pressure boundary integrity must be maintained to assure the safety injection capability of the CCPs.)

- In Mode 4, one CCP is required to be operable to meet TS 3.5.3 emergency core cooling requirements. In accordance with ECG 8.1, the PDP is required to be operable in plant Mode 4 for Appendix R fire protection (see discussion under "Fire Protection Safety Function"). Therefore, either one CCP or the PDP will be available to fulfill the TS 3.1.2.4 emergency boration function in plant Mode 4.

- In Modes 5 and 6, TS 3.1.2.3 requires one charging pump to be operable for emergency boration. This may be either one CCP or the PDP. There is no backup required per this TS.

In conclusion, emergency boration capability is required by the TS for all plant modes. All three charging pumps can be relied upon to meet the TS emergency boration requirement in plant Modes 1 through 4 and, as such, backup capabilities for emergency boration are available. Backup capabilities to the PDP are not required by the TS in plant Modes 5 and 6.

Fire Protection Safety Function

During an Appendix R scenario where there is a fire in the CCP room rendering both CCPs inoperable, credit is taken for use of the PDP in plant Modes 1 through 4 to achieve cold shutdown by providing both pressurizer level control and boration capability. A single failure that would render the PDP inoperable is not considered as part of this Appendix R scenario. Therefore, there is no need for backup equipment to the PDP to provide for Appendix R fire protection.

Adequate controls and procedures exist to provide assurance that both the block valve and discharge valve are in the open position when the PDP is operable (see discussion under "Operational and Administrative Controls"). The requirement to maintain operability of the PDP to fulfill the Appendix R fire protection function is provided in ECG 8.1. If the PDP becomes inoperable, the ECG requires compensatory actions to assure that the CCPs will not be rendered inoperable due to a fire.

Backpressure Considerations

NRC letter dated December 6, 1993 also discusses the potential failure of the upstream piping because of system backpressure downstream of the relief valve. Relief valve backpressure due to seat leakage or built-up pressure as the relief valve opens was considered in our previous evaluation.

Deformation and leakage of either drain valve 54 or the relief valve discharge flange occur at much lower pressures (430 to 500 psi) than the operating conditions on the inlet side of the relief valve (i.e., PDP discharge line). This leakage will effectively limit backpressures to these levels. With this backpressure present, the relief valve will still open before pressure in the relief valve inlet piping (PDP discharge line) approaches the rupture point of the piping. The backpressure may cause a momentary dynamic response of the relief valve disc due to the rapid pressurization that would occur from a blockage in the PDP discharge line. However, the positive displacement characteristics of this pump would also displace the unbalanced area of the relief valve disc and ensure that an open path through the leaking drain valve or relief valve discharge flange is maintained.

Therefore, PG&E believes that the PDP will not be rendered inoperable due to an overpressurization event. The pressure needed to open the relief valve disc with a backpressure of 500 psi is not sufficient to rupture the piping upstream of the relief valve. Additionally, as discussed in "Operational and Administrative Controls," PG&E believes there are sufficient controls in place to ensure that PDP discharge isolation valve 830 will be opened prior to placing the PDP in service and that block valve 831 will remain in the locked open position. Note that either of these conditions (i.e., 830 or 831 is opened) would alone be sufficient to preclude piping rupture.

Operational and Administrative Controls

The following operational and administrative controls ensure that PDP discharge isolation valve 830 will be opened prior to placing the PDP in service and that block valve 831 will remain in the locked open position, thereby precluding simultaneous closure of the valves:

1. When the PDP is placed in service for normal charging following a plant refueling, Operating Procedure OP B-1A:I, "Charging, Letdown and Seal Injection - Place in Service," is used to establish charging flow. A procedural prerequisite is to have the CVCS aligned in accordance with OP B-1A:IX, "CVCS - Alignment Verification Checklist for Plant Startup," which ensures that PDP discharge isolation valve 830 is open and that block valve 831 is locked open. OP B-1A:IX requires adjusting to specific charging and reactor coolant pump seal flow conditions, which ensures that appropriate open flow paths are available.

2. If the PDP is cleared for maintenance, the allowed outage time and required actions are controlled by ECG 8.1. Operating Procedure OP B-1A:XI, "Charging Pumps - Clearing for Maintenance and Returning to Service," is used for clearing the PDP for maintenance and returning it to service. When the PDP is cleared for maintenance, the procedure requires closure of PDP discharge isolation valve 830. Following maintenance, when the PDP is again made available for service, the procedure requires that valve 830 is opened and sealed.

3. Transfer of system charging function between charging pumps is governed by OP B-1A:V, "Transfer Charging Pumps." When transferring the charging function from the CCP to the PDP, procedural steps ensure that the desired charging flow is maintained by the PDP while reducing demand on the operating CCP. Once the PDP speed controller is placed in AUTO, proper operation is again verified.

4. Block valve 831 is locked open with a padlock; the Operations Department has the only key.

5. PDP discharge isolation valve 830 and block valve 831 are included in Operation Procedure K-10A9, "Sealed Valve Check List for Charging Pump 1(2)-3," to provide positive administrative control.

6. Block valve 831 is included in Surveillance Test Procedure I-1D, "Routine Monthly Checks Required by Licenses," to verify the block valve is in its required open position on a monthly basis.

Therefore, based on the above operational and administrative controls, PG&E believes that potential overpressurization of the PDP discharge piping is precluded whenever the PDP is operable.