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CHARLES CENTER · P. O. BOX 1475 · BALTIMORE, MARYLAND 21203

January 17, 1983

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

Director of Nuclear Reactor Regulation
Attention: Mr. R. A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Calvert Cliffs Nuclear Power Plant
Unit No. 1; Docket No. 50-317
Pressurizer Safety Valve Operability

References: (1) Letter from F. P. Bolger, Dresser Industries to A. R. Thornton, Baltimore Gas and Electric Company, dated January 5, 1983.

(2) Letter CE-OG-576 from J. H. Hutton, Combustion Engineering to C-E Owners Group, dated December 23, 1982.

Gentlemen:

As you know, Baltimore Gas and Electric Company has been evaluating the results of the EPRI-sponsored safety and relief valve test program to determine the possible safety significance of variations in the set positions of the pressurizer safety valve blowdown rings. The purpose of this letter is to inform you of the nature of our evaluation and our conclusions concerning the continued operation of Calvert Cliffs Unit No. 1.

Background

During recent telephone conversations with our engineering personnel you expressed the concern that improper ring adjustments on the Unit 1 & 2 pressurizer safety valves could result in a reduction in valve discharge capability, a condition discovered during recent EPRI tests of Dresser-supplied valves. We were able to verbally provide you at that time with the ring settings for the Unit 2 safety valves since they had just been readjusted during the current refueling outage. Those ring settings are as follows:

Valve No.	Ring	Setting	
2-RV-200	Upper	(-)48	Notches below the top of the vent holes in guide
	Middle	(-)40	Notches below seat plane
	Lower	(+) 9	Notches above seat plane (approx.)
2-RV-201	Upper	(-)48	(Refer to above)
	Middle	(-)40	(")
	Lower	(+)11	(")

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The Unit No. 2 valve ring settings are consistent with the results of the EPRI tests. We were not able to provide you with the ring adjustments for the Unit No. 1 valves during our telephone conversation since the settings can only be verified by physically inspecting the valves or by locating and examining the appropriate records. Inspection of the valves requires that the plant be placed in a cold shutdown condition. So as not to divert our technical resources from the ongoing refueling outage at Unit No. 2, we proceeded to conduct searches through our plant files and make inquiries directed to Dresser Industries for a specific record of the Unit No. 1 ring settings. No such records were found. However, it is now our understanding that strict documentation of safety valve ring adjustments during assembly and testing at the factory may not have been required. However, a check of the Dresser standard manual for these valves specifies the following ring settings:

"Upper" Ring	-	Flush with top of vent holes
"Middle" Ring	-	Flush with nozzle seat plant
"Lower" Ring	-	8 notches below seat plane

Evaluation

In Reference (1), which is attached for your information, Dresser Industries informed us that when refurbishing these valves their personnel will reset the adjusting rings to the original "as found" positions unless otherwise instructed.

Of the two pressurizer safety valves currently installed in Unit 1, one was a spare valve that had been delivered to Calvert Cliffs along with the valves that were originally installed in the plant. This valve was subsequently used to replace one of the originally installed Unit 1 safety valves; however, the spare valve was sent back to Dresser to have its lift pressure reset before installation. The existing ring adjustments on this valve were not changed by plant personnel at any time during this evolution. As a precaution against such changes Dresser Industries installs a locking wire on the rings before delivery. Moreover, Calvert Cliffs personnel are only permitted to make changes to the safety valve ring settings with the concurrence of appropriate Dresser Industries personnel. The other Unit 1 pressurizer safety valve is one that had been installed as original plant equipment. This valve had been sent back to Dresser for refurbishment some time ago, but in this case the nozzle had been removed and the valve was returned to us after refurbishment with a new nozzle and ring adjustments set in accordance with the Dresser assembly procedure.

In light of this policy and the above discussion, we consider it likely that the rings on both valves are adjusted in accordance with the Dresser Industries standard manual.

In Reference (1) Dresser provides an evaluation of the possible effect of variations in ring settings on pressurizer safety valve performance. If we assume that the Unit 1 valve rings are set in accordance with the Dresser standard manual as discussed above, the lower ring settings would be about eight notches below the seat. Referring to the Dresser evaluation, it can be inferred that this setting would yield between 60% and 80% of full lift. To gain further confidence that the as-delivered ring settings for safety valves received from Dresser have been in accordance with the Dresser standard manual, we examined the ring settings that were measured on the two Unit No. 2 safety valves prior to readjustment. These measurements were as follows:

Valve No.	Ring	Setting
2-RV-200	Upper	Flush with the top of the vent holes
	Middle	28 notches up from seat plane
	Lower	Flush with seat plane
2-RV-201	Upper	18 notches down from top of vent holes
	Middle	26 notches up from seat plane
	Lower	2 notches down from seat plane

In these two cases the as-found settings for the lower rings or the Unit 2 safety valves were six to eight notches higher than specified by the Dresser standard manual. Again referring to the above Dresser evaluation, it can be inferred that these higher settings would yield greater than 80% of full lift.

In Reference (2), C-E provided a reanalysis of the Calvert Cliffs plant response to a Loss of Load Event leading to reactor coolant system overpressurization. The purpose of this reanalysis was to determine the plant sensitivity to degraded safety valve performance. The reanalysis included runs using worst case (highly conservative) assumptions as well as best estimate (realistic) assumptions.

The results of the C-E reanalysis show that, for all but the "worst case" assumptions, the pressurizer safety valves will not be challenged by an RCS overpressure transient. For the "worst case" the analysis indicates that less than 20% of the RCS design safety valve capacity (20 percent for one valve or 10 percent for each valve) would be required to prevent exceeding the RCS upset design pressure. Conservatisms assumed for the "worst case" include taking no credit for the following: reactor trip on turbine trip; pressurizer spray actuation; power-operated relief valve operation or steam bypass system operation.

During a telephone conversation with our NRC Project Manager on January 10, 1983, we were asked to indicate whether the moderator temperature coefficient for the Unit No. 1 reactor core was positive or negative. Core physics data indicate that the Unit 1 moderator temperature coefficient at 100 percent power is negative and will remain so throughout the present cycle.

Conclusions

Based on our investigations and evaluations to date, we conclude that:

1. Sufficient primary system relieving capacity is available to prevent exceeding the RCS upset design pressure during a postulated overpressurization transient even under extreme conditions of valve flow degradation. With even the most unfavorable ring settings each of the two safety valves is capable of achieving greater than 10% of full lift (yielding greater than the 20% of design relief valve capacity that is required to mitigate this event);

2. There is reasonable assurance that the actual ring settings for the Unit 1 valves are in accordance with the Dresser standard manual, and that these settings should yield between 60% and 80% of full lift for each valve according to the EPRI tests;

3. Normal pressurizer relief capacity is provided by the two on-line power-operated relief valves, each of which is able to provide approximately 50 percent of rated safety valve flow;

4. Continued operation of Calvert Cliffs Unit No. 1 with the existing safety valve ring settings presents no undue risk to the public health and safety and is, therefore, acceptable until the valves can be actually inspected (and modified as appropriate) during the next cold shutdown outage of sufficient duration.

Very truly yours,

J. W. Gore, Jr.
for A. E. Lundvall, Jr.
Vice President - Supply

AEL/BSM/gvg

Attachment

cc: J. A. Biddison, Esq.
G. F. Trowbridge, Esq.
Mr. D. H. Jaffe, NRC

DRESSER INDUSTRIES

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January 5, 1983

Baltimore Gas & Electric Company
P. O. Box 1475
Charles Center
Baltimore, Maryland 21203

Attention: Mr. Al Thornton

Subject: Ring Positions 31739A Valves

Gentlemen:

With reference to our recent telecons on this subject, we offer the following information:

Dresser service personnel will reset the adjusting rings to the original "as found" positions when refurbishing valves unless otherwise instructed. The standard manual positions for these rings are:

Upper - Flush with top of holes
Middle - Flush with nozzle seat
Lower - 8 notches below seat

We have no other information about these ring positions.

A survey of our records for eight plants for which we were able to obtain ring positions shows that all the top rings are at -48 notches; middle rings vary from -40 to +70; lower rings vary from -12 to +11.

EPRI tests of this size valve (300 test series) show approximately 60% of full lift when the bottom ring is at the -13 position and the middle ring is flush. This increases to 80% when the bottom ring is at -6. There is no data for middle rings in the +70 position, but the tests show that the position of this ring and the upper ring is relatively unimportant.

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If we accept that the bottom ring position is the controlling component at these low lifts, then it appears that the valve will have significant lift at any feasible position. Dresser has not performed tests under these conditions, so we are unable to be more specific. However, if the known EPRI test points are plotted for the bottom ring, they show a very slow decline in lift versus ring position and the ten percent point is not reached until the ring is dropped below its full travel.

I hope this information is useful to you.

Sincerely,

F. P. Bolger
Chief Engineer
Consolidated Valves

FPB/sc