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PG&E Letter DCL-03-052

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Diablo Canyon Unit 1 Reactor Vessel Material Surveillance Program Capsule V
Technical Report

Dear Commissioners and Staff:

On May 13, 2002, surveillance Capsule V was withdrawn from the Diablo Canyon Power Plant (DCPP) Unit 1 reactor vessel and shipped to Westinghouse for testing. Pursuant to 10 CFR 50 Appendix H, Part IV.A, this submittal provides the Capsule V technical report. Enclosure B is the Westinghouse technical report, WCAP-15958, Revision 0, "Analysis of Capsule V from Pacific Gas and Electric Company Diablo Canyon Unit 1 Reactor Vessel Radiation Surveillance Program."

Pursuant to 10 CFR 50.61(b)(1) and 10 CFR 50 Appendix H, Part IV.C, included herein are the results of: (1) the pressurized thermal shock (PTS) evaluation, (2) the reactor coolant system (RCS) pressure/temperature (P/T) limit curve evaluation, (3) the low temperature overpressure (LTOP) setpoint evaluation, and the upper shelf energy (USE) evaluation.

Evaluation

Table D-2 of WCAP-15958 (Enclosure B) summarizes the best-fit surveillance capsule data chemistry factor (CF) evaluation. The Capsule V plate and weld data point resulted in new best-fit curves. As a result, the Capsule S plate data point now has a scatter value that exceeds a one-sigma value of 17°F, and the Capsule Y weld data point now has a scatter value that exceeds a one-sigma value of 28°F. Therefore, neither the plate nor the weld data meet Regulatory Guide (RG) 1.99, Revision 2, criterion 3, and the data are not deemed to be credible. Also, the plate and weld CF values calculated from the surveillance data are less than the corresponding RG 1.99 position 1.1 values. Thus, the WCAP-15958 Table D-2 CF values derived for the plate and weld metal were not used in this evaluation.

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For the Unit 1 end of operating license (EOL) at approximately 32 effective full power years (EFPY) on September 22, 2021, the limiting RT_{PTS} values calculated and their respective 10 CFR 50.61 screening limits are:

$RT_{PTS}(\text{weld 3-442C}) = 250.9^{\circ}\text{F}$, which is $<270^{\circ}\text{F}$ plate or axial weld limit

$RT_{PTS}(\text{weld 9-442}) = 192.8^{\circ}\text{F}$, which is $<300^{\circ}\text{F}$ circumferential weld limit

Therefore, the PTS screening limits are met at EOL. PG&E performed this evaluation.

Table 1 of Enclosure A shows that the DCP Unit 1 adjusted reference temperatures projected to 16 EFPY are less than the quarter thickness (T/4) and three quarter thickness (3T/4) values assumed for the existing 16 EFPY P/T limit curves and LTOP setpoint found in the DCP pressure and temperature limits report (PTLR). The P/T limit curves and LTOP setpoints for 16 EFPY remain bounding and valid. This evaluation was not included in the scope of WCAP-15958. Instead, PG&E performed this evaluation with the results shown in Table 1.

The Westinghouse USE evaluation for the surveillance capsule materials is provided in Table C-1 of WCAP-15959. Appendix G of 10 CFR 50 requires that the USE remain ≥ 50 ft-lb throughout the life of the vessel at T/4. In addition, PG&E calculated the USE for the vessel materials not in the capsule. The most limiting (minimum) T/4 USE at EOL, (approximately 32 EFPY), is 61.9 foot-pounds (ft-lbs). This is predicted to occur for axial weld 3-442C. Thus the 50 ft-lb minimum requirement is met for all Unit 1 vessel materials at EOL.

Conclusion

In conclusion, the results of the specimen testing show that the limiting vessel beltline plate and weld material are behaving in accordance with previous predictions. Consequently, the results from Capsule V do not indicate any changes needed to the LTOP setpoints or P/T curves currently approved. Capsule V is not the last planned capsule to be evaluated in the DCP Unit 1 surveillance program.

In PG&E Letter DCL-02-079, "License Amendment Request 02-04, Revision of Technical Specification 5.6.6 - Reactor Coolant System Pressure and Temperature Limits Report," dated July 31, 2002, PG&E requested NRC review and approval of PG&E's proposed application of the PTLR methodology that will allow PG&E to calculate new P/T and LTOP limits without prior staff approval. As required by Technical Specification 5.6.6(c), PG&E will also submit the revised PTLR, including data from the Capsule V report, when the PTLR is issued, upon approval of the PTLR methodology.

Sincerely,

A handwritten signature in black ink, appearing to read "D. H. Oatley". The signature is stylized with a large, looped "D" and "O".

David H. Oatley
Vice President and General Manager - Diablo Canyon

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Enclosure

cc: David L. Proulx
cc/enc: Ellis W. Merschoff
Girija S. Shukla