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PG&E Letter DCL-10-141

10 CFR 50, App. H

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1
Revision to the Unit 1 Reactor Vessel Material Surveillance Program Withdrawal Schedule

Dear Commissioners and Staff:

Pursuant to 10 CFR 50, Appendix H, Section III.B.3, Pacific Gas and Electric Company (PG&E) hereby requests approval for a revision to the Unit 1 reactor vessel material surveillance program withdrawal schedule.

The Unit 1 reactor material surveillance program withdrawal schedule is provided in the Diablo Canyon Power Plant (DCPP) Final Safety Analysis Report Update (FSARU) Table 5.2-22. The proposed change would revise that schedule to reflect withdrawal of Capsule B during the Unit 1 Seventeenth Refueling Outage, which is scheduled to begin May 1, 2012. The NRC approved withdrawal schedule for Capsule B is during the Unit 1 Sixteenth Refueling Outage (1R16). DCPP is currently in 1R16 and the schedule for entry into mode 2 is 1900 hours on November 2, 2010, which is the next time the specimen would be subjected to additional fluence.

During 1R16, refueling personnel have not been able to remove the Capsule B access plug on the reactor core barrel flange. Removal of the access plug is required to gain access to the specimen capsule. Normally the plug is held in place by its own weight (approximately five pounds). Refueling personnel have applied over 2,000 pounds of force in attempts to remove the plug. The application of additional extraction force may result in damage and prevent the plug from being reinserted after the capsule is removed. If the plug itself is damaged or the hole is deformed, the vendor does not have a spare access plug and is not prepared to machine the hole in the flange of the core barrel during the current refueling outage. There is also a concern for introducing foreign material to the reactor vessel if personnel damage the plug or tool while attempting to remove the plug.

Therefore, PG&E requests revision to the Unit 1 reactor vessel material surveillance program withdrawal schedule to allow withdrawal of Capsule B during the Unit 1 Seventeenth Refueling Outage (1R17). Removal of Capsule B during 1R17 will ensure adequate time to allow for the appropriate tooling, materials, and contingency plans to be in place to remove and reinsert or replace the Capsule B access plug.

DCPP has withdrawn and tested three capsules from Unit 1 that meet the three recommendations of ASTM E 185-70 and the approved supplemental surveillance capsule withdrawal changes listed in NRC staff Safety Evaluation dated September 4, 1992. The withdrawal and testing of Capsule V during the Unit 1 Eleventh Refueling Outage fulfilled the third and final recommendation of ASTM E 185-70 for the current DCPP Unit 1 operating license. Therefore, the proposed delayed removal of Capsule B does not deviate from DCPP's current reactor vessel materials surveillance program requirements. DCPP installed the Unit 1 Capsule B in the vessel in the Unit 1 Fifth Refueling Outage at a vessel exposure of 5.86 effective full power years (EFPY). The change in withdrawal schedule allows Capsule B to be withdrawn at a fluence of approximately 60 EFPY for the reactor pressure vessel. This will provide reactor pressure vessel fluence data for the period of extended operation for license renewal.

Enclosure 1 provides a description and assessment of the proposed change to the reactor vessel material surveillance program withdrawal schedule. Enclosure 2 provides a mark-up of the affected DCPP FSARU page.

To support implementation of the revised withdrawal schedule, PG&E requests approval of this proposed change by November 1, 2010. PG&E will revise DCPP FSARU Table 5.2-22 to incorporate the change upon NRC approval.

If you have any questions, please contact Mr. Tom Baldwin at (805) 545-4720.

Sincerely,

James R. Becker
Site Vice President

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Enclosures
cc/enc: Elmo E. Collins, NRC Regional Administrator, Region IV
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DESCRIPTION AND ASSESSMENT

1.0 BACKGROUND

Appendix H of 10 CFR 50 (Reference 1) requires a material surveillance program to monitor changes in the fracture toughness properties of ferritic material in the reactor vessel beltline region that result from exposure of these materials to neutron irradiation and the thermal environment. Under this program, fracture toughness test data are obtained and analyzed from material specimens exposed in surveillance capsules that are withdrawn periodically from the reactor vessel. Test results must be reported to the NRC within one year of the date of the capsule withdrawal. In addition, Section III.B.3 of Appendix H to 10 CFR 50 requires the NRC to approve the capsule withdrawal schedule prior to implementation.

The design of the surveillance program and the withdrawal schedule must meet the requirements of the edition of ASTM E 185 that is current on the issue date of the ASME Code to which the reactor vessel was purchased. The ASTM E 185 version of record for Diablo Canyon Power Plant (DCPP) Unit 1 is ASTM E 185-70. A Unit 1 supplemental reactor vessel surveillance capsule program schedule was requested by DCPP in Pacific Gas and Electric Company (PG&E) Letter DCL-92-072, dated March 31, 1992. The NRC approved this program in a letter to PG&E dated September 4, 1992, “Evaluation of Diablo Canyon Unit 1 Supplemental Reactor Vessel Radiation Surveillance Program (TAC No. M83285).” The schedule to withdraw Capsule B during the Unit 1 Sixteenth Refueling Outage was requested by DCPP in PG&E Letter DCL-08-021, dated March 12, 2008. DCPP requested this schedule revision to allow additional fluence exposure to the Unit 1 Capsule B to satisfy the NUREG-1801 requirement to have a capsule with fluence exposure between one and two times the vessel end of license extension fluence (54 EFPY fluence). The NRC approved this schedule revision by letter to PG&E dated September 24, 2008, “Diablo Canyon Power Plant, Unit No. 1 – Approval of Proposed Reactor Vessel Material Surveillance Capsule Withdrawal Schedule (TAC No. MD8371).”

2.0 DESCRIPTION OF CHANGES TO THE REACTOR VESSEL MATERIAL SURVEILLANCE PROGRAM WITHDRAWAL SCHEDULE

The Unit 1 Reactor Material Surveillance Program withdrawal schedule is located in the DCPP Final Safety Analysis Report Update (FSARU). The proposed change revises the schedule to change the removal time for Capsule B from 21.9 effective full power years (EFPY) to 23.2 EFPY.

Unit 1 Capsule B was installed in the vessel in the Unit 1 Fifth Refueling Outage at a vessel exposure of 5.86 EFPY per FSARU Table 5.2-22. The lead factor for Capsule B at the 40 degree location is 3.46 per FSARU Table 5.2-22. The equivalent exposure on Capsule B at its withdrawal during the Unit 1 Seventeenth Refueling Outage is projected to be (23.2 - 5.86) x 3.46 = 60.0 EFPY.

3.0 ANALYSIS

NUREG-1801 requires that a licensee pursuing license renewal, and not crediting alternative dosimetry, must have a reactor vessel surveillance program consisting of a vessel material coupon that has fluence exposure equivalent to 60 years of operation. PG&E submitted its License Renewal Application for DCPP Unit 1 and 2 in PG&E Letter dated November 2009, and which is currently undergoing NRC review. The current DCPP withdrawal schedule for Unit 1 meets the NUREG-1801 requirements for license renewal. A removal time of 23.2 EFPY for Capsule B corresponds to 60 EFPY. This will continue to satisfy the NUREG-1801 requirements, which is to have a capsule with fluence exposure between one and two times the vessel end of license extension fluence (54 EFPY fluence).

The DCPP Unit 2 surveillance capsule withdrawal program currently meets the requirements of NUREG-1801; therefore, no changes in the DCPP Unit 2 surveillance capsule withdrawal program are needed.

This request to revise the removal time for DCPP Unit 1 Capsule B does not deviate from DCPP's current reactor pressure vessel materials surveillance program requirements.

4.0 REFERENCES

1. Code of Federal Regulations, Title 10, Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements."

2. American Society of Testing and Materials, "Standard Recommended Practice for Surveillance Tests for Nuclear Reactor Vessels," ASTM E 185-70.

3. Diablo Canyon Final Safety Analysis Report Update (FSARU), Revision 19, May 2010.

4. NUREG–1801, "Generic Aging Lessons Learned (GALL)," Revision 1, 2005.

5. PG&E Letter DCL-09-079, “License Renewal Application,” dated November 23, 2009.

MARK-UP of TABLE 5.2-22

REACTOR VESSEL MATERIAL SURVEILLANCE PROGRAM
WITHDRAWAL SCHEDULE

UNIT 1

Capsule[f][g]	Location	Lead Factor[d]	Removal Time (EFPY)[a]
S	320°	3.46	1.25 (Tested,1R1)
Y	40°	3.44	5.86 (Tested, 1R5)
T	140°	3.44	5.86 (Removed, 1R5)
Z	220°	3.44	5.86 (Removed, 1R5)
V	320°	2.26	14.3 (Tested 1R11)
C[b]	140°	3.46	15.9 (Removed 1R12)
D[b]	220°	3.46	15.9 (Removed 1R12)
B[b]	40°	3.46	~~21.9~~ 23.2
A[b]	184°	1.31	Standby
U	356°	1.28	Standby
X	176°	1.28	Standby
W	4°	1.28	Standby

UNIT 2

Capsule	Location	Lead Factor[d]	Removal Time (EFPY)[a]
U	56°	5.15	1.02(Tested,2R1)
X	236°	5.40	3.16 (Tested, 2R3)
Y	238.5°	4.58	7.08 (Tested, 2R6)
W[e]	124°	5.26	11.49 (Removed, 2R9)
V[e]	58.5°	4.58	11.49 (Tested, 2R9)
Z[e]	304°	5.26	11.49 (Removed, 2R9)

(a) Approximate full power years from plant startup
(b) Four supplemental capsules installed at 5.86 EFPY (EOC5)
(c) Deleted in Revision 16
(d) Approximate lead factors taken from WCAP-15958 (Rev. 0) and WCAP-15423 (Rev. 0) for Units 1 and 2, respectively
(e) EFPY for Unit 2 capsules removed in 2R9; W = 60.4, V = 52.6, and Z = 60.4
(f) Unit 1 capsules T, U, W, X, and Z are Type 1 (base metal only)
(g) Unit 1 capsules S, V, and Y are Type 2 (base metal and weld)