

Sptember 24, 2008

Mr. John Conway
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SUBJECT: DIABLO CANYON POWER PLANT, UNIT NO. 1 - APPROVAL OF PROPOSED
REACTOR VESSEL MATERIAL SURVEILLANCE CAPSULE WITHDRAWAL
SCHEDULE (TAC NO. MD8371)

Dear Mr. Conway:

By letter dated March 12, 2008, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix H, Section III.B.3, Pacific Gas and Electric Company (the licensee) submitted a request to revise the current reactor pressure vessel (RPV) materials surveillance capsule program withdrawal schedule for Diablo Canyon Power Plant (DCPP), Unit 1. Specifically, the licensee proposed to modify the DCPP, Unit 1 withdrawal schedule to remove RPV Material Surveillance Capsule B during the DCPP, Unit 1 refueling outage (RFO) 16 in October of 2010, instead of during the RFO 15 in January of 2009.

The NRC staff has concluded that the proposed surveillance capsule withdrawal schedule for DCPP, Unit 1, is in accordance with Appendix H, "Reactor Vessel Material Surveillance Program Requirements," to 10 CFR Part 50, and recommendations of the American Society for Testing and Materials Standard Practice (ASTM) E 185-70 and ASTM E185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." The safety evaluation is enclosed.

If you have any questions, please contact me at (301) 415-1445.

Sincerely,
/RA/

Alan Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-275

Enclosure: As stated

cc w/encl: See next page

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*See Previous concurrence

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Diablo Canyon Power Plant, Units 1 and 2

(6/2008)

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST TO REVISE THE REACTOR VESSEL MATERIAL SURVEILLANCE

PROGRAM WITHDRAWAL SCHEDULE FOR

DIABLO CANYON POWER PLANT, UNIT 1

DOCKET NO: 50-275

1.0 INTRODUCTION

In a letter dated March 12, 2008 to the U.S. Nuclear Regulatory Commission (NRC) (Agencywide Documents Access and Management System Accession No. ML080850564), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements," Pacific Gas and Electric Company (the licensee) submitted a request to the NRC to revise the current supplemental reactor pressure vessel (RPV) material surveillance program withdrawal schedule at Diablo Canyon Power Plant (DCPP), Unit 1. The proposed schedule change has been developed in accordance with the American Society for Testing and Materials (ASTM) Standard Practice E 185-70, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." Specifically, the licensee proposed to modify the DCPP, Unit 1 withdrawal schedule to remove RPV Material Surveillance Capsule B during the unit's refueling outage (RFO) 16 in October of 2010 instead of during the unit's RFO 15 in January of 2009.

2.0 REGULATORY EVALUATION

Appendix H to 10 CFR Part 50 requires licensees to monitor changes in the fracture toughness properties of ferritic materials in the RPV beltline region of light water nuclear power reactors. Appendix H states that all plants must develop a surveillance program and withdrawal schedule that meets the requirements of the edition of ASTM Standard Practice E-185 that is current on the issue date of the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME) Code to which the RPV was purchased. Later editions of ASTM Standard Practice E 185 may be used, but including only those editions through 1982 (i.e., ASTM E 185-82). NUREG-1801, "Generic Aging and Lessons Learned (GALL) Report," provides additional guidance concerning the development of surveillance programs to accommodate the 60-year extended period of operation if license renewal is pursued.

The supplemental RPV material surveillance program for DCPP, Unit 1 was developed to follow the recommendation in ASTM E 185-70, the edition of the ASTM Standard Practice in effect when the unit's RPV was fabricated and then purchased to the 1965 Edition through 1966 Summer Addenda of ASME Code, Section III. Originally, the DCPP, Unit 1 RPV material surveillance program called for removing five out of eight installed surveillance capsules. By letter dated March 31, 1992, the licensee made supplemental changes to the original DCPP, Unit 1, RPV material surveillance program, which added four additional supplemental capsules

containing critical limiting material. Capsule B was scheduled to be removed when it reaches a neutron fluence level that is equivalent to the peak RPV inside surface neutron fluence at 48 effective full power years (EFPY) of operation.

3.0 TECHNICAL EVALUATION

The current licensing basis for the DCP, Unit 1 RPV material surveillance program is in accordance with ASTM E 185-70, along with supplemental changes made at DCP as described in NRC staff safety evaluation (SE) dated September 4, 1992, "Evaluation of Diablo Canyon Unit 1 Supplemental Reactor Vessel Radiation Surveillance Program (TAC No.M83285)." ASTM E 185-70 recommends that sets of specimens be removed at three or more separate times. It specifically recommends one specimen be obtained that corresponds to neutron exposure of the reactor vessel at no greater than 30% of the designed life. There is no specific requirement for when the data point shall be obtained for the second capsule, and the third data point obtained shall correspond to the neutron exposure of the reactor vessel near the end of its design life.

Currently, the licensee has withdrawn and tested three capsules from the DCP, Unit 1 RPV that meet all three recommendations of ASTM E 185-70, and the approved supplemental surveillance capsule withdrawal changes listed in the September 4, 1992, SE. The withdrawal and testing of Capsule V during DCP, Unit 1 RFO 11 fulfilled the third and final recommendation of ASTM E 185-70 for the current DCP, Unit 1 operating license. Capsule V, upon removal and testing at 32.3 EFPY, had an accumulated neutron fluence of 1.37×10^{19} neutrons per square centimeter (n/cm^2), which is representative of the RPV fluence value at end of license (EOL). Therefore, the proposed delayed removal of Capsule B does not deviate from the licensee's current RPV materials surveillance program requirements. The change in withdrawal schedule for Capsule B to be withdrawn at a fluence approximately equivalent to 75.8 EFPY for the RPV will provide high fluence data of the RPV useful for license renewal application.

5.0 CONCLUSION

Based on NRC staff review of the licensee's submittal, the NRC staff found that the proposed modification to DCP, Unit 1 withdrawal schedule for removal of RPV material surveillance Capsule B during the RFO 16 in October of 2010 complies with the requirements of ASTM E 185-70. Therefore, the NRC staff concludes that the licensee's modified material surveillance capsule withdrawal schedule for DCP, Unit 1 satisfies the requirements of Appendix H to 10 CFR Part 50 and is acceptable for implementation. The licensee must revise the material surveillance program capsule withdrawal schedule in the UFSAR (Section 5.0) for DCP, Unit 1 with only changes approved in this SE.

The Commission has concluded, based on the considerations discussed above regarding the revised RPV materials surveillance capsule program withdrawal schedule, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by the revised withdrawal schedule, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the revised withdrawal schedule will not be inimical to the common defense and security or to the health and safety of the public.

In addition, the NRC staff finds that the revised withdrawal schedule for RPV material surveillance Capsule B, which is consistent with the current license for operation of 40 years (32 EFY), allows future RPV withdrawals of material surveillance capsules to obtain RPV data with estimated fluence values greater than 40 years. However, this SE does not provide determination on material surveillance program for any period of extended operation for DCP, Unit 1. The NRC staff will evaluate the applicability of the withdrawal schedule for the extended period of operation once the licensee has submitted a license renewal application for DCP, Unit 1.

Principal Contributor: J. Oxendine

Date: September 24, 2008