



**Pacific Gas and
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July 23, 2007

PG&E Letter DCL-07-072

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

Docket No. 50-275, OL-DPR-80
Diablo Canyon Unit 1

60-Day Response to First Revised NRC Order EA-03-009 Establishing Interim
Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water
Reactors

Dear Commissioners and Staff:

On February 11, 2003, the NRC issued Order EA-03-009 for interim inspection requirements for reactor pressure vessel heads at pressurized water reactor facilities. On February 20, 2004, the NRC issued the First Revised Order EA-03-009, which superseded Order EA-03-009. The revised Order modified the requirements regarding nondestructive examination (NDE) of the penetration nozzles and requires that, within 60 days after returning a unit to operation, licensees provide a description of the inspections performed in accordance with the Order, and describe any leaks or boron deposits found during the inspection.

During the Diablo Canyon Power Plant (DCPP) Unit 1 Fourteenth Refueling Outage (1R14), completed on May 29, 2007, Pacific Gas and Electric Company (PG&E) performed a bare metal visual inspection of 100 percent of the reactor pressure vessel (RPV) head penetrations, including 360 degrees around each of the vessel head penetration nozzles and the head vent penetration. Visual inspection of greater than 95 percent of the RPV head surface was also performed to identify any degradation. No evidence of vessel head penetration nozzle leakage or cracking, or degradation of the RPV head was identified. PG&E also performed nonvisual volumetric NDE on all 79 reactor head penetration tubes and the head vent penetration. The examination detected no discontinuities or indications of boric acid leak paths, and no flaws needing disposition or corrective action were identified. In addition, PG&E performed a visual inspection to identify potential boric acid leaks from the pressure-retaining components above the RPV head and no evidence of leakage was identified. The Enclosure contains the 60-day response for DCPP 1R14 required by the first revised Order EA-03-009.

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If you have questions or require additional information, please contact Mr. Stan Ketelsen at (805) 545-4720.

I state under penalty of perjury that the forgoing is true and correct.

Executed on July 23, 2007.

Sincerely,

A handwritten signature in black ink, appearing to read 'James R. Becker', with a large, stylized flourish extending to the right.

James R. Becker
Vice President – Diablo Canyon Operations and Station Director

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Enclosure

cc: Terry W. Jackson, NRC Senior Resident Inspector
Bruce S. Mallett, Region IV
Sandra Shewry, California Department of Health Services
Diablo Distribution
cc/enc: Alan B. Wang, NRR

**60-Day Response to First Revised NRC Order EA-03-009 Establishing
Interim Inspection Requirements for Reactor Pressure Vessel Heads at
Pressurized Water Reactors**

NRC Required Information:

The first revision of NRC Order EA-03-009, dated February 20, 2004, required that, for each inspection required in Paragraph C of the Order, the Licensee shall submit a report detailing the inspection results within 60 days after returning the plant to operation. For each inspection required in Paragraph D of the Order, the Licensee shall submit a report detailing the inspection results within 60 days after returning the plant to operation if a leak or boron deposit was found during the inspection.

PG&E Response:

Diablo Canyon Power Plant (DCPP) Unit 1 has accumulated approximately 12.07 total effective degradation years prior to the Unit 1 Fourteenth Refueling Outage (1R14). Therefore, Pacific Gas and Electric Company (PG&E) was required to perform an inspection in accordance with NRC Order EA-03-009, Sections IV.C.(5) and IV.D.

During 1R14, which was completed on May 29, 2007, PG&E complied with Section IV.C.(5)(a) of the revised Order by performing a bare metal visual examination of the reactor pressure vessel (RPV) head penetrations, including 360 degrees around each of the vessel head penetration (VHP) nozzles and the head vent penetration. The bare metal visual inspection to identify degradation covered greater than 95 percent of the RPV head surface. The only area not covered by the bare metal visual inspection was that area inaccessible due to support structure interference. However, the inspection included those areas of the RPV head upslope and downslope from the support structure interference. No evidence of boron or corrosion product was found and no evidence of VHP nozzle leakage or cracking, or degradation of the RPV head was identified.

During 1R14, PG&E also complied with Section IV.C.(5)(b)(i) of the revised Order by performing a nonvisual nondestructive volumetric examination (NDE) on all 79 reactor head penetration tubes (RHPT) and the head vent penetration. A combination of ultrasonic (UT) and eddy current testing methods was used with probes delivered to the tubes by a remote positioning device (or manually in the case of the head vent tube).

In preparation for this examination, PG&E and inspection vendor Level III NDE examiners reviewed the Unit 1 Thirteenth Refueling Outage volumetric examination data with consideration of the Institute of Nuclear Power Operations

Operational Experience (OE) from examination results at two other stations, Beaver Valley Unit 2 and Byron Station Unit 2. These data review screens were applied as they became available to the industry and the inspection vendor. The first screen, using the Beaver Valley OE, noted a number of tubes that were designated as special interest tubes, and selected for finer increment scans. The second screen, using the Byron Station OE, conducted just days before the start of DCP's 1R14 examination, noted one tube, penetration No. 71, that had UT reflector characteristics with enough similarities to the Byron Station flawed tube to be of concern. A senior management review team was convened to consider this information and its implication to DCP's 1R14 examination. DCP management directed that tube No. 71 be examined first with high resolution UT scans followed by an underhead personnel entry to perform a dye penetrant (PT) surface examination of the suspect area, as the PT was the discriminant examination used at both the Beaver Valley and Byron Stations to determine that actual flaws existed.

The PT surface examination of this tube revealed that no flaws were present on the inspected surface. The UT data acquired on tube No. 71 showed no measurable change in the reflector of interest. The fine increment UT scans on all other special interest tubes also noted no indications of concern.

The inspection encountered limitations to the Order's specified examination areas in a few of the RHPTs due to the large as-built configuration of the J-welds, the chamfer at the end of the tubes, and the geometry of the transducers on the examination probes. The inspection coverage above the J-groove weld satisfies the order requirements for all penetrations. The inspection coverage below the J-groove weld on the downhill side of the penetrations was achieved for most of the penetration tubes; however, the coverage specified in the Order could not be achieved on all of the penetrations. PG&E requested relaxation from the requirement of Section IV.C.(5)(b) of the revised Order where inspection coverage is limited by inaccessible areas of the vessel head penetration nozzles for DCP Unit 1. This request for relaxation was made to the NRC in PG&E Letter DCL-05-067, "Relaxation Request for NRC Issuance of First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated May 27, 2005. The NRC approved relaxation from this requirement of the Order for DCP Unit 1 by letter, "Diablo Canyon Power Plant, Unit No. 1 – Relaxation of Requirements Associated with First Revised Order (EA-03-009) dated February 20, 2004, Regarding Alternate Examination Coverage for Reactor Pressure Vessel Head Penetration Nozzles (TAC No. MC7071)," dated October 26, 2005. The examination limitations encountered were within the provisions of the approved relief request. The examinations on all tubes detected no discontinuities or indications of boric acid leak paths, no flaws needing engineering disposition, and no corrective actions were identified.

Finally, during 1R14, PG&E complied with Section IV.D of Revision 1 of the Order by performing a visual inspection to identify potential boric acid leaks from pressure-retaining components above the RPV head. No evidence of leakage from the pressure-retaining components above the RPV head was identified.

One other OE issue experienced at other facilities was addressed during the 1R14 examination, regarding wear on thermal sleeves at the interface with the Control Rod Drive Mechanism tube. All thermal sleeves were examined for wear using high resolution cameras mounted on the inspection robot. No wear was detected. No further evaluations were required.