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Manager of
Nuclear Regulatory Affairs

May 26, 2006

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C., 20555-0001

Subject: **Docket No. 50-361**
60-day Post Cycle 14 Refueling Outage
Reactor Pressure Vessel Head Inspection Report
for San Onofre Nuclear Generating Station, Unit 2

Reference: First Revised NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors"

Dear Sir or Madam:

This letter provides the Southern California Edison Company (SCE) 60-day post refueling outage response to First Revised NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors" for San Onofre Nuclear Generating Station, Unit 2.

As required by First Revised NRC Order EA-03-009, SCE completed inspections of the reactor pressure vessel head (RPVH) penetrations during the Unit 2 Cycle 14 refueling outage, which ended on April 22, 2006.

In summary, SCE performed a bare metal visual inspection of all 102 RPVH penetrations, a volumetric examination (and supplemental inside diameter surface examination) of all 91 control element drive mechanism (CEDM) nozzles, a wetted surface examination of the vent line penetration, and a volumetric examination of all ten In-Core Instrument (ICI) nozzles. Visual inspections were also performed to identify potential boric acid leaks from pressure-retaining components above the RPV head.

No primary water stress corrosion cracking was identified in any reactor vessel head penetration or attachment weld, no through-wall leakage was identified at any reactor vessel head penetration, and no indication of reactor vessel head degradation was identified during the performance of these inspections at SONGS Unit 2. The SONGS

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Unit 2 reactor head required no additional corrective actions or root cause evaluations. Additional details of the specific inspection activities are provided in the Enclosure.

If you have any questions or would like additional information concerning this subject, please call Mr. Jack Rainsberry (949) 368-7420.

Sincerely,

Enclosure

cc: B. S. Mallett, Regional Administrator, NRC Region IV
N. Kalyanam, NRC Project Manager, San Onofre Units 2 and 3
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3

Enclosure

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San Onofre Nuclear Generating Station, Unit 2

References:

1. First Revised NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors"

2. Letter from H. N. Berkow (NRC) to H. B. Ray (SCE) dated June 27, 2005; Subject: Relaxation of the Requirements of Order EA-03-009 Regarding Reactor Pressure Vessel Head Inspections, San Onofre Nuclear Generating Station (SONGS), Units 2 and 3 (TAC Nos. MC5522 and MC5523)

3. Letter from J. Donohew (NRC) to H. B. Ray (SCE) dated September 26, 2005; Subject: San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, Re: Correction to Relaxation of the Requirements of Order EA-03-009 Regarding Reactor Pressure Vessel Head Inspections (TAC Nos. MC5522 and MC5523)

The following activities were completed for the San Onofre Nuclear Generating Station (SONGS) Unit 2 reactor head during the Cycle 14 refueling outage:

In accordance with part IV.A, SCE calculated the susceptibility category of the SONGS Unit 2 RPVH to PWSCC related degradation, as represented by a value of effective degradation years (EDY) for the end of each operating cycle, using the specified equation. As of the end of the Cycle 13 fuel cycle the calculated value for SONGS Unit 2 was 17.5 EDY.

In accordance with part IV.B, SCE assigned SONGS Unit 2 to the High PWSCC susceptibility category.

In accordance with part IV.C.(1), SCE performed Reactor Pressure Vessel (RPV) head and head penetration nozzle inspections using the techniques of paragraph IV.C.(5)(a) and paragraph IV.C.(5)(b).

In accordance with paragraph IV.C.(5)(a), a bare metal visual examination of no less than 95 percent of the RPV head surface (including 360° around each RPV head penetration nozzle) was performed. Very minor amounts of surface corrosion were present in some locations with no measurable depth. SCE confirmed that the surface obscured by support structure interferences which are located at RPV head elevations downslope from the outermost RPV head penetration constitute less than 5 percent of the RPV head surface. SCE inspected those areas of the RPV head upslope and downslope from the support structure interferences. The SONGS reactor heads have lift rig structural attachment points at 15 locations evenly spaced around the perimeter. Each of these support locations has a vertical and a horizontal surface that is obscured from visual inspection. Each obscured surface has dimensions of approximately five

inches by six inches. There was no evidence of boron or degradation of the reactor head material in these areas.

In accordance with paragraph IV.C.(5)(b), non-visual NDE was performed on each of the 102 penetrations.

The vent line was examined in accordance with method (ii), an ET examination of the entire wetted surface of the J-groove weld and the vent line penetration. The inspection probes for both the weld surface and the vent line penetration surfaces were delivered manually. No indications of PWSCC were identified as a result of this inspection.

All 91 CEDM penetrations were examined in accordance with method (i), UT examinations of the penetration nozzle volume from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to as far down the nozzle as possible. The effective inspection coverages above and below the weld for each nozzle are provided in the CEDM Coverage Table. There were no exceptions to the minimum inspection distances approved for SONGS Unit 2 (References 2 and 3). Supplemental ET surface examinations of the inside diameters of all 91 CEDM penetrations and the OD surface below the weld of CEDM # 87 were performed. No indications of PWSCC were identified as a result of this inspection.

All ten ICI penetrations were examined in accordance with method (i), UT examinations. The inspection techniques used included: remote UT from the ID surface and remotely delivered UT examinations on the ICI bottom face. Supplemental ET surface examinations of the inside diameters and bottom face surfaces of all 10 ICI penetrations were performed. No indications of PWSCC were identified as a result of this inspection.

In accordance with part IV.D, visual inspections were performed to identify potential boric acid leaks from pressure-retaining components above the RPV head.

In accordance with part IV.E, SCE submits this report within 60 days after returning the plant to operation.

In conclusion, SCE found no evidence of Reactor Vessel Head degradation or boric acid leakage from the reactor coolant pressure boundary during these inspection activities.

60-day Post Cycle 14 Refueling Outage
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CEDM Coverage Table

Measured Coverage Above and Below CEDM Welds

	Inspection Coverage	
Penetration #	Above Weld	Below Weld
Pen 01	3.80	1.28
Pen 02	3.60	1.28
Pen 03	3.84	1.28
Pen 04	3.28	1.24
Pen 05	3.80	1.40
Pen 06	3.56	1.40
Pen 07	3.72	1.32
Pen 08	3.32	1.16
Pen 09	3.48	1.24
Pen 10	3.68	1.28
Pen 11	3.32	1.20
Pen 12	3.52	1.28
Pen 13	3.24	1.32
Pen 14	3.52	1.28
Pen 15	3.36	1.36
Pen 16	3.32	1.32
Pen 17	3.40	1.08
Pen 18	3.56	1.32
Pen 19	3.48	1.20
Pen 20	3.32	1.12
Pen 21	3.56	1.12
Pen 22	3.68	0.96
Pen 23	3.56	1.08
Pen 24	3.44	1.16
Pen 25	3.24	1.08
Pen 26	3.48	1.20
Pen 27	3.68	0.88
Pen 28	3.32	1.24
Pen 29	3.84	1.32
Pen 30	3.36	1.24
Pen 31	3.32	1.16
Pen 32	3.36	1.28
Pen 33	3.40	1.16
Pen 34	3.76	1.16
Pen 35	3.32	1.12
Pen 36	3.32	1.20
Pen 37	3.56	1.16
Pen 38	3.52	1.12
Pen 39	3.28	0.96
Pen 40	3.16	0.92
Pen 41	3.60	0.88
Pen 42	3.60	1.12
Pen 43	3.60	0.92
Pen 44	3.68	1.24
Pen 45	3.20	1.00

	Inspection Coverage	
Penetration #	Above Weld	Below Weld
Pen 46	3.48	1.24
Pen 47	3.64	1.00
Pen 48	3.52	0.92
Pen 49	4.08	1.08
Pen 50	3.16	0.96
Pen 51	3.36	1.12
Pen 52	3.28	1.24
Pen 53	3.12	0.92
Pen 54	3.60	0.88
Pen 55	3.44	0.76
Pen 56	3.32	1.00
Pen 57	3.92	0.92
Pen 58	3.32	0.80
Pen 59	3.64	0.84
Pen 60	3.28	1.00
Pen 61	3.68	1.00
Pen 62	3.28	0.96
Pen 63	3.36	0.76
Pen 64	3.40	0.96
Pen 65	3.28	0.80
Pen 66	3.68	0.88
Pen 67	3.40	0.72
Pen 68	3.36	0.88
Pen 69	3.76	0.90
Pen 70	3.76	1.00
Pen 71	3.76	0.80
Pen 72	3.80	0.68
Pen 73	3.24	0.56
Pen 74	3.40	0.88
Pen 75	3.52	0.64
Pen 76	3.72	0.80
Pen 77	3.56	1.00
Pen 78	3.72	0.76
Pen 79	3.16	0.84
Pen 80	3.60	1.04
Pen 81	3.64	0.92
Pen 82	3.56	0.52
Pen 83	3.60	0.56
Pen 84	3.40	0.64
Pen 85	3.24	0.68
Pen 86	3.44	0.94
Pen 87	3.68	0.88
Pen 88	2.72	0.68
Pen 89	2.80	0.80
Pen 90	2.52	0.56
Pen 91	2.40	0.60