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Director
Nuclear Regulatory Affairs

February 17, 2009

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

Subject: Docket No. 50-362
60-day Post Refueling Outage Reactor Pressure Vessel Head Inspection Report for San Onofre Nuclear Generating Station, Unit 3

References: 1) EA-03-009, Subject: "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors," dated February 20, 2004

2) Letter from A. E. Scherer (SCE) to Document Control Desk (NRC) dated November 19, 2008; Subject: Docket No. 50-362, Status of Embedded Flaw Repair Process for Reactor Vessel Head Penetration #64, San Onofre Nuclear Generating Station, Unit 3

Dear Sir or Madam:

This letter provides the Southern California Edison Company (SCE) 60-day post refueling outage response for San Onofre Nuclear Generating Station (SONGS) Unit 3. Those inspections were required by the First Revised NRC Order EA-03-009 (Reference 1) which remained effective through December 31, 2008. SCE completed inspections of the Reactor Pressure Vessel Head (RPVH) penetrations during the Unit 3 Cycle 15 refueling outage, which ended on December 18, 2008.

In summary, SCE performed a bare metal visual inspection of the RPVH surface including 360 degrees around all 102 RPVH penetrations, Non Destructive Examination (NDE) Ultrasonic Test (UT) and leak path assessment of all 91 Control Element Drive Mechanism (CEDM) nozzles and all 10 In-Core Instrument (ICI) nozzles, and NDE eddy current testing of the wetted surface of the vent line penetration. Visual inspections were also performed to identify potential boric acid leaks from pressure-retaining components above the RPVH. In addition to the requirements of the First Revised Order, supplementary surface examinations were performed on the inside diameter (ID) surfaces of all 91 CEDM and 10 ICI penetrations as well as the J-groove welds on CEDM numbers 29 and 40.

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No through-wall leakage was identified at any reactor vessel head penetration, no boric acid leaks were identified from pressure-retaining components above the RPVH, no boric acid deposits were found on RPVH surfaces, and no degradation of reactor vessel head base material was identified during the performance of these inspections at SONGS Unit 3.

Ultrasonic testing confirmed that indications in CEDM nozzles 32, 64, and 57 that were identified and repaired in 2004 had not changed. Additionally the weld overlays applied during those repairs were examined using Dye Penetrant (PT) performed per footnote 3 of NRC Order (EA-03-009) paragraph IV.C.(1). No recordable indications were found during the PT of CEDMs 32 and 57. As reported in SCE's letter dated November 19, 2008 (Reference 2), a single rejectable indication was identified in the repair weld of CEDM 64. The underlying defect was captured within a boat sample excavation and is undergoing further analysis to determine its cause. The excavation cavity was restored to its original configuration by welding and was examined using PT with satisfactory results.

There are no new commitments contained in this letter.

If you have any questions or would like additional information concerning this subject, please call Ms. Linda Conklin at (949) 368-9443.

Sincerely,

Enclosure

cc: E. E. Collins, Regional Administrator, NRC Region IV
N. Kalyanam, NRC Project Manager, San Onofre Units 2 and 3
G. G. Warnick, NRC Senior Resident Inspector, San Onofre Units 2 and 3

Enclosure

60-day Post Refueling Outage
Reactor Pressure Vessel Head Inspection Report for
San Onofre Nuclear Generating Station, Unit 3 Cycle 15

References:

1. EA-03-009, Subject: "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors", dated February 20, 2004

2. Letter from Herbert N. Berkow (NRC) to Harold B. Ray (SCE); 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. MC5552 AND MC5523), dated June 27, 2005

3. Letter from Jack Donohew (NRC) to Harold B. Ray (SCE); 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. MC5552 AND MC5523), dated September 26, 2005

4. NRC letter, S. Dembeck to A. Scherer, "San Onofre Nuclear Generating Station, Units 2 and 3, Inservice Inspection Program Relief Request ISI-3-8, Embedded Flaw Repair Process (TAC Nos. MC1470 and MC1471)", dated May 5, 2004

5. SCE letter, A. E. Scherer (SCE) to the U.S. Nuclear Regulatory Commission dated May 11, 2006; Subject Docket No. 50-362, Third Ten-Year Inservice Inspection (ISI) Interval Relief Request ISI-3-21 Request for Alternative to ASME Code Rules for the Embedded Flaw Repair Process for Control Element Drive Mechanism (CEDM) # 56, San Onofre Nuclear Generating Station, Unit 3

6. Letter from A. E. Scherer (SCE) to the U. S. Nuclear Regulatory Commission dated November 20, 2006; Subject: Docket No. 50-362 Additional Information Supporting Third Ten-Year Inservice Inspection (ISI) Interval Relief Request ISI-3-21 Request for Alternative to ASME Code Rules for the Embedded Flaw Repair Process for Control Element Drive Mechanism (CEDM) #56, San Onofre Nuclear Generating Station, Unit 3

7. Letter from A. E. Scherer (SCE) to the U. S. Nuclear Regulatory Commission dated August 31, 2007; Subject: Docket No. 50-362, Evaluation of Reactor Vessel Head Inspection Data for Control Element Drive Mechanism (CEDM) #56, San Onofre Nuclear Generating Station, Unit 3

8. Letter from A. E. Scherer (SCE) to the U. S. Nuclear Regulatory Commission dated November 19, 2008; Subject: Docket No. 50-362 Status for Embedded Flaw Repair Process for Reactor Vessel Head Penetration #64, San Onofre Nuclear Generating Station, Unit 3

The following activities were completed for the San Onofre Nuclear Generating Station (SONGS) Unit 3 reactor head during the Cycle 15 refueling outage:

In accordance with section IV.A of NRC Order EA-03-009 (Reference 1), Southern California Edison (SCE) determined the total effective degradation years (EDY) at the end of the Cycle 14 fuel cycle for the SONGS Unit 3 Reactor Pressure Vessel Head (RPVH) to be 18.4 EDY. In accordance with EA-03-009 part IV.B, SCE assigned SONGS Unit 3 to the High PWSCC susceptibility category.

In accordance with EA-03-009 part IV.C (1), SCE performed RPVH and head penetration nozzle inspections using the techniques of paragraph IV.C.(5)(a) and paragraph IV.C.(5)(b).

In accordance with EA-03-009 paragraph IV.C.(5)(a), a bare metal visual examination of no less than 95 percent of the RPVH surface (including 360° around each head penetration nozzle) was performed. Evidence of rust stains that lacked visual characteristics typical of boric acid corrosion were observed on the RPV head surface adjacent to penetration numbers 29 and 40. These stains had not been present during the previous cycle bare metal visual exam. The rust colored stains were confined to the immediate area surrounding the penetration and did not adjoin any area that is obscured from view by support structures. All other locations on the RPV head surface were found to be free of corrosion, degradation or boric acid deposits.

Inspection in accordance with section IV.D verified that the deposits at CEDMs 29 and 40 did not originate from leakage of pressure retaining components above the RPV head. Swipes of the deposits were taken for chemical and radio isotopic analysis. Neither deposit was found to contain detectable Boron. Evaluation of isotopic analyses further concluded that the deposits were not consistent with reactor coolant leakage. Supplemental eddy current examinations of the J-groove weld surface for each of these two penetrations were also performed. Those J-weld exams, along with penetration volumetric exam, leak path assessment and ID surface exams confirmed that the rust stains were not associated with a pressure boundary defect. The stains were completely removed by the process of obtaining swipes for radio chemistry analysis.

SCE confirmed that the surface obscured by support structure interferences which are located at RPVH elevations downslope from the outermost RPVH penetration constitute less than 5 percent of the RPVH surface. SCE inspected those areas of

the RPVH upslope and downslope from the support structure interferences. There was no evidence of boric acid or degradation of the RPVH material in any of these areas.

In accordance with EA-03-009 paragraph IV.C.(5)(b), non-visual NDE was performed on each of the 102 penetrations as described below:

Head Vent Line

The vent line was examined in accordance with method (ii), using Eddy Current Testing (ET). The ET examination included the entire wetted surface of the J-groove weld and the wetted penetration inside diameter (ID) surface from at least 2 inches above the highest point of the root of the J-groove weld to the bottom of the penetration. No indications of PWSCC were identified as a result of this head vent line inspection.

CEDM penetrations

All 91 Control Element Drive Mechanism (CEDM) penetrations were examined in accordance with method (i), Ultrasonic Testing (UT). The effective inspection coverage above the root and below the toe of the weld for each nozzle is provided in Attachment 1. There were no exceptions to the minimum inspection distances approved for SONGS Unit 3 in Relaxation Request #3 (References 2 and 3). Using UT, an assessment of the annulus between each CEDM penetration and the RPVH determined that no leakage path had developed.

Indications in CEDMs 32, 57, and 64 exhibited no discernable growth since being repaired prior to Cycle 13 operation. The three overlay repair weld surfaces were also examined using Dye Penetrant (PT) per the order paragraph IV.C.(1) note 3. CEDMs 32 and 57 had no recordable indications. A rounded, rejectable indication in the repair weld of CEDM 64 was identified and corrected as described in Reference 8.

Reference 7 describes analyses performed by SCE that determined the indication originally identified in CEDM 56 during the cycle 13 refueling outage is not a defect. As a result, supplemental inspection requirements of References 4, 5 and 6 are no longer applicable to CEDM 56.

In addition to the examinations required by EA-03-009, supplemental ET surface examination of the inside diameters of all 91 CEDM penetrations and the J-weld surfaces of CEDMs 29 and 40 were also performed. No PWSCC was identified by any of these supplemental examinations.

Incore Instrument (ICI) penetrations

All 10 ICI penetrations were examined in accordance with method (i), UT examinations. These inspections included UT from the ID surface and from the ICI bottom face such that the entire ICI penetration nozzle volume was examined, from at least 2 inches above the highest point of the root of the J-groove weld to the bottom of the nozzle. A UT based assessment of the annulus between each ICI penetration and RPVH determined that no leakage path had developed.

In addition to the examinations required by EA-03-009, supplemental ET examination of the inside diameter and bottom face surfaces of all ten ICI penetrations were also performed. No indications of PWSCC were identified by these inspections.

In accordance with EA-03-009 part IV.D, visual inspections were performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. No indications of leakage were detected.

In accordance with EA-03-009 part IV.E, SCE submits this report within 60 days after returning the plant to operation.

Attachment 1:

Measured Coverage
Above and Below CEDM Welds

60-day Post Refueling Outage
Reactor Pressure Vessel Head Inspection Report for
San Onofre Nuclear Generating Station, Unit 3 Cycle 15

Attachment 1:

Measured Coverage Above and Below CEDM Weld

	Inspection Coverage	
Penetration #	Inches Above Weld	Inches Below Weld
Pen 01	5.44	1.44
Pen 02	4.44	1.32
Pen 03	4.56	1.16
Pen 04	4.12	1.40
Pen 05	4.28	1.36
Pen 06	4.28	1.00
Pen 07	4.36	1.24
Pen 08	4.72	1.28
Pen 09	4.68	1.20
Pen 10	4.72	1.08
Pen 11	4.52	1.20
Pen 12	4.60	1.32
Pen 13	4.44	1.36
Pen 14	4.36	1.08
Pen 15	4.52	1.36
Pen 16	4.52	1.28
Pen 17	4.64	1.16
Pen 18	4.76	1.36
Pen 19	4.60	1.28
Pen 20	4.48	1.20
Pen 21	4.40	1.16
Pen 22	4.40	1.04
Pen 23	4.60	1.28
Pen 24	4.48	1.16
Pen 25	4.32	1.12
Pen 26	4.44	1.12
Pen 27	4.40	1.12
Pen 28	4.76	1.08
Pen 29	4.80	1.24
Pen 30	4.64	1.12
Pen 31	4.80	1.12
Pen 32	4.88	1.16
Pen 33	4.84	0.92
Pen 34	4.88	1.16
Pen 35	4.80	0.96
Pen 36	4.40	0.76
Pen 37	4.32	0.68
Pen 38	4.28	1.08
Pen 39	4.28	0.88
Pen 40	4.68	0.80
Pen 41	4.56	1.12
Pen 42	4.44	1.08
Pen 43	4.48	0.96
Pen 44	4.56	0.92
Pen 45	4.32	0.88

	Inspection Coverage	
Penetration #	Inches Above Weld	Inches Below Weld
Pen 46	4.80	0.84
Pen 47	4.68	0.60
Pen 48	4.52	0.92
Pen 49	4.56	0.60
Pen 50	4.40	1.04
Pen 51	4.48	0.84
Pen 52	4.64	0.72
Pen 53	4.68	0.96
Pen 54	4.60	0.84
Pen 55	4.52	0.96
Pen 56	3.80	1.16
Pen 57	4.64	1.30
Pen 58	4.80	0.80
Pen 59	4.84	0.80
Pen 60	4.44	0.84
Pen 61	4.30	0.88
Pen 62	4.40	0.84
Pen 63	5.40	0.68
Pen 64	4.76	0.80
Pen 65	4.68	0.80
Pen 66	4.40	0.88
Pen 67	4.44	0.92
Pen 68	3.36	0.84
Pen 69	4.72	0.64
Pen 70	4.76	0.60
Pen 71	4.92	0.64
Pen 72	4.64	0.72
Pen 73	4.68	0.64
Pen 74	4.80	0.68
Pen 75	4.84	0.68
Pen 76	5.04	0.72
Pen 77	4.72	0.68
Pen 78	4.52	1.04
Pen 79	4.48	0.84
Pen 80	4.44	0.52
Pen 81	4.60	0.76
Pen 82	4.52	0.80
Pen 83	4.32	0.60
Pen 84	4.40	0.60
Pen 85	4.52	0.60
Pen 86	4.36	0.60
Pen 87	4.44	0.56
Pen 88	2.36	0.52
Pen 89	3.84	0.36
Pen 90	3.84	0.40
Pen 91	3.96	0.36