



SOUTHERN CALIFORNIA  
**EDISON**

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Dwight E. Nunn  
Vice President

September 11, 2002

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

**Subject: Docket Nos. 50-361 and 50-362  
30-day Response to NRC Bulletin 2002-02 "Reactor Pressure Vessel  
Head and Vessel Head Penetration Nozzle Inspection Programs"  
San Onofre Nuclear Generating Station  
Units 2 and 3**

References: See Enclosure 1

Dear Sir or Madam:

This letter provides the Southern California Edison Company (SCE) 30-day response to NRC Bulletin 2002-02 "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs" (Reference 1).

The stated purpose of Bulletin 2002-02 is for the Nuclear Regulatory Commission (NRC) to learn what changes, if any, pressurized water reactor (PWR) licensees have made to their inspection programs for the reactor pressure vessel head and vessel head penetration nozzles, and the justification for reliance on visual examinations if that is their primary method to detect degradation.

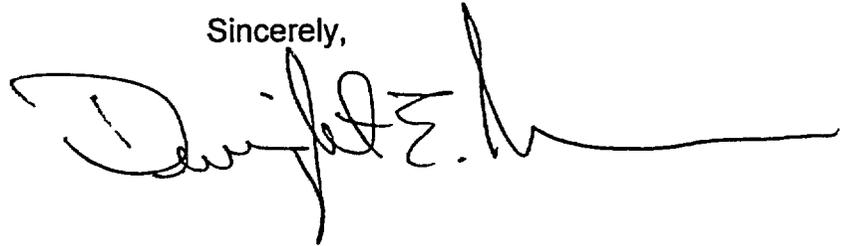
By letters dated August 31, 2001 (Reference 2) and April 2, 2002 (Reference 3), SCE provided descriptions of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 reactor vessel head penetrations (RVHP) inspection program. These descriptions were provided in response to NRC Bulletins 2001-01 and 2002-01 (References 4 and 5). Enclosure 2 provides the updated SONGS Units 2 and 3 RVHP inspection program, as requested by NRC Bulletin 2002-02, and supercedes the program descriptions provided in references 2 and 3.

PO Box 128  
San Clemente, CA 92674-0128  
949-368-1480  
Fax 949-368-1490

*File 96*

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

Sincerely,

A handwritten signature in black ink, appearing to read "David E. Merschoff". The signature is fluid and cursive, with a long horizontal line extending to the right.

Enclosures

cc: E. W. Merschoff, Regional Administrator, NRC Region IV  
B. M. Pham, NRC Project Manager, San Onofre Units 2, and 3  
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 & 3

## **Enclosure 1 References**

- 1) NRC Bulletin 2002-02: Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs, dated August 9, 2002.
- 2) Letter from Dwight. E. Nunn (SCE) to the Document Control Desk (NRC) dated August 31, 2001; Subject: Docket Nos. 50-361 and 50-362, 30-day Response to NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles, San Onofre Nuclear Generating Station, Units 2 and 3
- 3) Letter from Dwight. E. Nunn (SCE) to the Document Control Desk (NRC) dated April 2, 2002; Subject: Docket Nos. 50-361 and 50-362, 15-day Response to NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity, San Onofre Nuclear Generating Station, Units 2 and 3
- 4) NRC Bulletin 2001-01: Circumferential Cracking Of Reactor Pressure Vessel Head Penetration Nozzles, dated August 3, 2001
- 5) NRC Bulletin 2002-01: Reactor Pressure Vessel Head Degradation And Reactor Coolant Pressure Boundary Integrity, dated March 18, 2002

## **Enclosure 2**

**SCE 30-day Response to NRC Bulletin 2002-02  
San Onofre Nuclear Generating Station (SONGS) Units 2 and 3,  
Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles  
Inspection Program**

**NRC Bulletin 2002-02 Request:**

- A. PWR addressees who plan to supplement their inspection programs with non-visual NDE methods are requested to provide a summary discussion of the supplemental inspections to be implemented. The summary discussion should include EDY, methods, scope, coverage, frequencies, qualification requirements, and acceptance criteria.

**SCE Response**

The San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 reactor vessel head penetration (RVHP) inspection program is similar to the "Example" provided in Bulletin 2002-02. One difference is that the example in Bulletin 2002-02 limits discussion to control rod drive mechanism (CRDM) penetrations, whereas the SONGS inspection program covers 91 control element drive mechanism (CEDM) penetrations (CEDM is equivalent terminology to CRDM), 10 Incore Instrumentation (ICI) penetrations, and 1 Reactor Head Vent penetration. Therefore, all 102 reactor vessel head penetrations are included in the SONGS RVHP inspection program.

The SONGS Units 2 and 3 RVHP inspection program is provided in the table titled "SONGS Units 2 and 3 Reactor Vessel Head Penetration (RVHP) Inspection Program." In summary, SCE's program includes bare metal visual examinations and ultrasonic testing (UT) examinations of the 102 RVHP, and eddy current testing (ECT) examinations of the 101 CEDM and ICI J-Groove welds.

The qualification requirements for the inspection equipment are currently evolving as new mock-ups are developed by EPRI and the vendors refine analysis techniques. A qualification demonstration of the inspection equipment used at SONGS is in progress. The qualification requirements for inspection techniques used at SONGS are maintained consistent with industry developments and standard practices. Non-Destructive Examination (NDE) technicians and analysts are American Society for Non-Destructive Testing (ASNT) certified and are trained on the specific NDE equipment and techniques to be used.

The flaw detection criteria applied at SONGS for UT include characteristics such as location, length, depth, orientation, tip signal, and loss of backwall reflection. A flow chart is utilized to guide the evaluator through the flaw evaluation process. For eddy current examinations, the detection criteria range from 0.020 inches to 0.060 inches and are also dependent on flaw characteristics.

If a flaw is identified, SCE will apply the acceptance criteria contained in the letter from Jack Strosnider (NRC), to Alex Marion (NEI), dated September 24, 2001; Subject: "Flaw Evaluation Criteria".

**SONGS Units 2 and 3  
Reactor Vessel Head Penetration (RVHP) Inspection Program**

| <b>Inspections<br/>(Note 1)</b>   | <b>Frequency/Time</b>  |   |
|---|--|---|
|   | <b>SONGS Unit 2<br/>15.5 EDY<br/>(Note 2)</b>  | <b>SONGS Unit 3<br/>15.2 EDY<br/>(Note 2)</b> |
| Ultrasonic Testing of 102 RVHP<br>Nozzle Base Material (Note 3)<br><br><b>and</b>   | Unit 2 - Cycle 13 Refueling Outage<br>Unit 3 - Cycles 12 and 13 Refueling Outages<br>(Notes 4 and 5) |   |
| Eddy Current Testing of the 101<br>CEDM and ICI J-Groove Welds<br>and 102 RVHP Inside Diameter<br>Surfaces (Notes 3, 6, 7, and 8)<br><br><b>and</b> | Unit 2 - Cycle 13 Refueling Outage<br>Unit 3 - Cycles 12 and 13 Refueling Outages<br>(Notes 4 and 5) |   |
| Bare Metal Visual Examination<br>of the 102 RVHP to Reactor<br>Pressure Vessel (RPV) Junction<br>at Top of RPV Head<br>(Note 9)                     | Every refueling outage beginning with the next<br>refueling outage.<br>(Note 4)                      |   |

**SONGS Units 2 and 3  
Reactor Vessel Head Penetration (RVHP) Inspection Program  
Table Notes**

**Note 1:** Experience has proven that it may not be possible to achieve 100% coverage of every RVHP. For each case that 100% coverage of a penetration cannot be achieved, a detailed description of the performed inspection and interference will be provided in the 30-day post outage letter.

**Note 2:** The Effective Degradation Year (EDY) values are approximated through August 2002.

**Note 3:** The area of coverage for RVHP inside diameter scans is defined as approximately one half inch above the top of the weld to approximately one half inch below the bottom of the weld, or as far down as possible, 360° around the penetration. This covers the area that has high residual stresses due to the fabrication process and is considered the area of highest susceptibility to primary water stress corrosion cracking (PWSCC).

**Note 4:** San Onofre Nuclear Generating Station (SONGS) Unit 3 Cycle 12 refueling outage is currently scheduled for January 6, 2003 and SONGS Unit 2 Cycle 13 refueling outage is currently scheduled to begin in February of 2004.

**Note 5:** The frequency of subsequent non-visual inspections following the Unit 3 Cycle 13 refueling outage will be determined based on results of SONGS examinations, objectives of the SONGS RVHP inspection program, and on industry and regulatory information as it becomes available.

**Note 6:** ECT of the reactor head vent penetration inside diameter surface is planned to be performed during the Unit 3 Cycle 12 refueling outage and during subsequent outages when non-visual inspections are performed provided that the testing equipment is available.

**Note 7:** ECT of the J-groove weld surfaces is planned for all penetrations except the reactor head vent penetration attachment weld surface. The safety significance of PWSCC in the reactor head vent penetration attachment weld is significantly less than the CEDM penetration attachment weld due to the smaller size of the vent penetration and the absence of a control rod. Given the lower safety significance associated with PWSCC of the head vent penetration attachment weld and the dose required to perform a dye penetrant inspection, the SONGS RVHP inspection program relies on the bare metal visual examination from above the head and the UT examination from the inside diameter of the head vent penetration in lieu of a dye penetrant examination of the reactor head vent penetration attachment weld.

**Note 8:** ECT of the RVHP outside diameter will only be performed when required to verify indications detected by ultrasonic testing from the inside diameter.

**Note 9:** If boron deposits or other indications of leakage are identified, then non-visual examination will be used to make a determination of whether or not the leakage is from a through-wall or through-weld crack.

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**NRC Bulletin 2002-02 Request:**

- B. PWR addressees who do not plan to supplement their inspection programs with non-visual NDE methods are requested to provide a justification for continued reliance on visual examinations as the primary method to detect degradation (i.e., cracking, leakage, or wastage). In your justification, include a discussion that addresses the reliability and effectiveness of the inspections to ensure that all regulatory and technical specification requirements are met during the operating cycle, and that addresses the six concerns identified in the Discussion Section of this bulletin. Also, include in your justification a discussion of your basis for concluding that unacceptable vessel head wastage will not occur between inspection cycles that rely on qualified visual inspections. You should provide all applicable data to support your understanding of the wastage phenomenon and wastage rates.

**SCE Response**

The SONGS Units 2 and 3 RVHP inspection program includes both visual and non-visual NDE methods.

State of California  
County of San Diego

Subscribed and sworn to (or affirmed) before me this 11<sup>th</sup> day of  
September, 2002.

By: Frances M. Thurber

