

April 26, 2000

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

**Subject: Docket Nos. 50-361 and 50-362  
Surveillance Capsule Withdrawal Schedule  
San Onofre Nuclear Generating Station Units 2 and 3**

**Reference:** Letter from D. E. Nunn (SCE) to the Document Control Desk (NRC) dated February 24, 2000; Subject: Docket Nos. 50-361 and 50-362, Amendment Application Nos. 195 and 180, Supplement 1, Proposed Change to the Operating License Expiration Date, San Onofre Nuclear Generating Station Units 2 and 3

Gentlemen:

This letter submits the San Onofre Units 2 and 3 surveillance capsule withdrawal schedules, Enclosure 1, for NRC approval in accordance with 10 CFR 50, Appendix H, Section III.B.3 as committed to in the referenced letter.

The San Onofre Units 2 and 3 reactor vessels were fabricated to the ASME Code, Section III, 1971 Edition. The applicable ASTM Code for surveillance tests is E-185-70. Section 4.6, "Specimen Withdrawal," of E-185-70 recommends that sets of specimens be withdrawn at three or more separate times. One of the data points shall correspond to the neutron exposure of the reactor vessel at no greater than 30 percent of its design life. One other data point shall correspond to the neutron exposure of the reactor vessel near the end of its design life.

The acceptability of the surveillance capsule withdrawal schedules proposed by Southern California Edison (SCE) is based on the following:

- 1) These surveillance capsule withdrawal schedules were approved by the NRC before and after the first capsules were withdrawn from each unit. (See Enclosure 2 for a detailed history of the surveillance capsule withdrawal schedules.)
  - a. The NRC issued the withdrawal schedule as part of the Unit 2 and 3 original Technical Specifications in 1982, then issued three separate Safety Evaluations on April 11, 1989, December 14, 1989, and July 17, 1995 which addressed the surveillance capsule withdrawal schedules.

*ACOB*

- b. The first Unit 2 surveillance capsule was withdrawn during the Unit 2 Cycle 4 refueling outage, on September 20, 1987, after 2.85 effective full power years (EFPY) of operation, a peak neutron fluence at the vessel inner surface of  $4.34 \times 10^{18}$  n/cm<sup>2</sup>, and an associated capsule neutron fluence of  $5.07 \times 10^{18}$  n/cm<sup>2</sup>.
    - c. The first Unit 3 surveillance capsule was withdrawn during the Unit 3 Cycle 5 refueling outage, May 4, 1990, after 4.33 EFPY of operation, a peak neutron fluence at the vessel inner surface of  $6.6 \times 10^{18}$  n/cm<sup>2</sup>, and an associated capsule neutron fluence of  $8.0 \times 10^{18}$  n/cm<sup>2</sup>.
- 2) These surveillance capsule withdrawal schedules are consistent with the schedule recommended in ASTM E-185-70, Section 4.6 based on the following:
  - a. 2.85 and 4.33 EFPY are not greater than 30 percent of the 32 EFPY design life.
  - b. 24 EFPY is near the end of the 32 EFPY design life. Furthermore, it is considered that the data at 24 EFPY will be more useful with 8 EFPY of vessel life remaining than waiting until closer to 32 EFPY.
  - c. The third capsule has no recommended withdrawal time in Section 4.6. However, the proposed SCE schedules contain times that are approximately half way between the first and the third capsule withdrawals.
- 3) These surveillance capsule withdrawal schedules are consistent with the regulations in effect when Units 2 and 3 were licensed: 10 CFR 50 Appendix H, prior to 1983. (See Enclosure 2 for the history of the surveillance capsule withdrawal schedules.)
- 4) Although the surveillance capsule removal times have not changed from those last approved by the NRC, this proposed schedule has a revised capsule selection, withdrawal order, and lead factor based on information collected from the Unit 3 initial capsule withdrawal and on the lead factor guidance provided in ASTM E-185-82.
- 5) The test procedures and reporting requirements used by SCE for the surveillance capsules meet the requirements of ASTM E-185-82 to the extent practical for the configuration of the specimens in the capsule.

The current 10CFR50 Appendix H, Section III.B.1. requires the design of the surveillance program and the withdrawal schedule to meet the requirements of the edition of ASTM E-185 that is current on the issue date of the ASME Code to which the reactor vessel was purchased. Later editions of ASTM E-185 may be used, but including only those editions through 1982. For each capsule withdrawal, the test procedures and reporting requirements must meet the requirements of ASTM E-185-82 to the extent practicable for the configuration of the specimens in the capsule.

The proposed schedules are consistent with ASTM E-185-70, which was current on the issue date of the ASME Code to which the reactor vessel was purchased. The test procedures and reporting requirements used by SCE for the surveillance capsules meet the requirements of ASTM E-185-82 to the extent practical for the configuration of the specimens in the capsule. Therefore, SCE requests NRC approval in accordance with 10 CFR 50, Appendix H, Section III.B.3.

As discussed above in Item 4, although the withdrawal schedule has not been changed, information related to that schedule is being updated based on ASTM E-185-82 and information collected from the initial capsule withdrawal from Unit 3. Additionally, the target fluences associated with the scheduled withdrawal times are being updated with information collected from the initial capsule withdrawal from Unit 3. This information is being incorporated in the next revision of the Updated Final Safety Analysis report. Enclosure 3 provides these changes in a table created to show both original and revised information regarding lead factors and target fluences.

The revised target fluence values for capsule removal at 13.6, 15.2 and 24 EFPY reflect the results from the Unit 3 capsule removal at 4.33 EFPY.

The results from the Unit 2 capsule removal at 2.85 EFPY represented the original standard core for both units. The cores in both units were reconfigured in a low leakage loading pattern which reduced the vessel and capsule fluxes following the Unit 2 capsule removal. The Unit 3 capsule removal at 4.33 EFPY represented the combined results of the standard and low leakage core designs. As such, target fluence values obtained from the results of the Unit 3 capsule removal at 4.33 EFPY provide better predicted values for Unit 2. Therefore, the Unit 3 results are used for both units.

SCE's license amendment requests to revise the license expiration date, referenced, did not include a change to the surveillance capsule withdrawal schedule because the revised license expiration dates are consistent with the 32 EFPY design life, which is the basis for the original schedule approved by the NRC (see Enclosure 2). Thirty-two EFPY is also the basis for the current and the proposed surveillance capsule withdrawal schedules, which continue to specify the same withdrawal times as last reviewed and approved by the NRC.

The second surveillance capsule for Unit 2 is scheduled to be withdrawn during the next refueling outage. Therefore, SCE requests approval of these schedules by August 31, 2000, to support the next San Onofre Unit 2 refueling outage, which is scheduled to begin October 7, 2000.

If you would like additional information regarding this issue, please contact me or Mr. J. L. Rainsberry at 949-368-7420.

Sincerely,

A handwritten signature in black ink, appearing to read "J. A. Sloan". The signature is fluid and cursive, written in a professional style.

Enclosures

cc: E. W. Merschoff, Regional Administrator, NRC Region IV  
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3  
L. Raghavan, NRC Project Manager, San Onofre Units 2 and 3

**Enclosure 1**

**San Onofre Units 2 and 3  
Reactor Vessel Surveillance Capsule  
Withdrawal Schedules**

**PROPOSED  
CAPSULE ASSEMBLY REMOVAL SCHEDULE**

**San Onofre Unit 2**

**San Onofre Unit 3**

| <b>Capsule No.</b> | <b>Azimuthal Location (deg)</b> | <b>Removal Time (EFPY)</b>          | <b>Lead Factor</b> | <b>Removal Time (EFPY)</b>          | <b>Lead Factor</b> |
|--------------------|---------------------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|
| <b>1</b>           | <b>83</b>                       | <b>24</b>                           | <b>1.21</b>        | <b>24</b>                           | <b>1.21</b>        |
| <b>2</b>           | <b>97</b>                       | <b>2.85 (U2C4 refueling outage)</b> | <b>1.21</b>        | <b>4.33 (U3C5 refueling outage)</b> | <b>1.21</b>        |
| <b>3</b>           | <b>104</b>                      | <b>Standby</b>                      | <b>0.86</b>        | <b>Standby</b>                      | <b>0.86</b>        |
| <b>4</b>           | <b>284</b>                      | <b>Standby</b>                      | <b>0.86</b>        | <b>Standby</b>                      | <b>0.86</b>        |
| <b>5</b>           | <b>263</b>                      | <b>13.6</b>                         | <b>1.21</b>        | <b>15.2</b>                         | <b>1.21</b>        |
| <b>6</b>           | <b>277</b>                      | <b>Standby</b>                      | <b>1.21</b>        | <b>Standby</b>                      | <b>1.21</b>        |

Enclosure 2

**San Onofre Units 2 and 3  
Surveillance Capsule  
Withdrawal Schedule History**

**San Onofre Units 2 and 3  
Surveillance Capsule  
Withdrawal Schedule History**

**A. Original License**

San Onofre Nuclear Generating Station (SONGS) Unit 2 was licensed on February 17, 1982 and Unit 3 was licensed on November 15, 1982. The following surveillance capsule withdrawal schedule was approved by the NRC and issued as part of the original technical specifications. This schedule was created in accordance with 10 CFR 50 Appendix H, prior to 1983, which contained the following schedule:

10 CFR 50 Appendix H

1. First capsule .....At the time when the predicted shift of the adjusted reference temperature is approximately 50 degrees or at one-fourth service life, which ever is earlier.
2. Second capsule.....At approximately one-half of the time interval between first and third capsule withdrawal.
3. Third capsule.....Three-fourths service life
4. Fourth capsule.....Standby

NRC APPROVED  
CAPSULE ASSEMBLY REMOVAL SCHEDULE

| Capsule No. | San Onofre Unit 2        |             |                        | San Onofre Unit 3 |                        |
|-------------|--------------------------|-------------|------------------------|-------------------|------------------------|
|             | Azimuthal Location (deg) | Lead Factor | Withdrawal Time (EFPY) | Lead Factor       | Withdrawal Time (EFPY) |
| 1           | 83                       | 1.15        | Standby                | 1.5               | Standby                |
| 2           | 97                       | 1.15        | 3.2                    | 1.5               | 5.6 *                  |
| 3           | 104                      | 1.15        | 13.6                   | 1.5               | 15.2                   |
| 4           | 284                      | 1.15        | 24                     | 1.5               | 24                     |
| 5           | 263                      | 1.15        | Standby                | 1.5               | Standby                |
| 6           | 277                      | 1.15        | Standby                | 1.5               | Standby                |

\* 5.6 EFPY was changed to 4.4 EFPY by Unit 3 License Amendment No. 71. See Item C., below.

**San Onofre Units 2 and 3  
Surveillance Capsule  
Withdrawal Schedule History**

**B. Unit 2 License Amendment Regarding Pressure/Temperature Limits**

On April 11, 1989, the NRC issued Unit 2 License Amendment No. 70 (TAC Nos. 71174 and 71175), to revise Technical Specifications 3/4.4.8.1, "Pressure/Temperature Limits;" 3.4.1.4.1, "Cold Shutdown-Loops Filled;" 3.4.1.3, "Hot Shutdown;" 3.4.8.3.1, "Overpressure Protection System, RCS Temperature less than or equal to 235°F;" and 3.4.8.3.2, "Overpressure Protection System, RCS Temperature greater than 235°F." This amendment contained the above schedule, with no change to the original technical specification. The Safety Evaluation contained the following statement:

"The SONGS 2 surveillance program also conforms to the requirements of Appendix H to 10 CFR 50."

**C. Unit 3 License Amendment Regarding Pressure/Temperature Limits**

On December 14, 1989, the NRC issued Unit 3 License Amendment No. 71 (TAC No. 73581) Technical Specifications (TS) 3/4.4.8.1, "Pressure/Temperature Limits;" TS 3.4.1.4.1, "Cold Shutdown-Loops Filled;" TS 3.4.1.3 "Hot Shutdown;" TS 3.4.8.3.1, "Overpressure Protection Systems, RCS Temperature less than or equal to 285°F;" and TS 3.4.8.3.2, "Overpressure Protection Systems, RCS Temperature greater than 285°F," and related tables, figures and surveillance requirements. This amendment contained the above schedule. This amendment approved the only change that has been made to the surveillance capsule withdrawal schedule since the original technical specifications were issued. Amendment No. 71 changed the first capsule withdrawal for Unit 3 from 5.6 EFPY to 4.4 EFPY. The Safety Evaluation contained the following:

"The licensee has proposed to change the current surveillance capsule removal schedule to remove the initial surveillance capsule from the reactor vessel at 4.4 EFPY instead of the current schedule at 5.6 EFPY."

"According to 10 CFR Part 50 Appendix H, Item II.B.1, for each capsule withdrawal after July 26, 1983, the test procedures and reporting requirements must meet the requirements of ASTM E 185-82 to the extent practical for the configuration of the specimens in the capsule. The requested change in the withdrawal schedule is the closest practical time period that the licensee can achieve in order to satisfy the requirements of ASTM E 185-82. According to 10 CFR Part 50 Appendix H, Item II.B.3, the proposed schedule must be approved prior to implementation. Therefore, this modification to the Technical Specifications is acceptable based upon the need to conform to ASTM E 185-82."

D. Units 2 and 3 License Amendment Regarding the Surveillance Capsule  
Withdrawal Schedule

On July 17, 1995 the NRC issued Amendment Number 121 for Unit 2 and 110 for Unit 3 (TAC Nos. M84516 and M84517). These amendments revised Technical Specification 3/4.4.8, "Pressure/Temperature Limits-Reactor Coolant System" and their associated Bases by removing the reactor vessel material surveillance capsule withdrawal schedules in accordance with the guidance in Generic Letter (GL) 91-01, "Removal of the Schedule for Withdrawal of Reactor Vessel Material Specimens from Technical Specifications." The Safety Evaluation contained the following:

"The staff's review of the proposed change determined that the relocation of the withdrawal schedules does not eliminate the requirements for the licensee to ensure that the reactor vessel is capable of performing its safety function. Section I.B.3 of Appendix H to 10 CFR Part 50 requires the submittal of a proposed withdrawal schedule for material specimens to the NRC and approval by the NRC before implementation. Hence, adequate regulatory controls exist to control changes to this schedule without the necessity of subjecting it to the license amendment process by including it in the TS."

**Enclosure 3**

**San Onofre Units 2 and 3  
Reactor Vessel Surveillance Capsule  
Withdrawal Schedule Comparison Tables**

San Onofre Unit 2 Comparison Table

| Capsule No. | Original Information     |                      |             | Revised Information*                |                              |             |                                     |
|-------------|--------------------------|----------------------|-------------|-------------------------------------|------------------------------|-------------|-------------------------------------|
|             | Azimuthal Location (deg) | Withdrawal Time EFPY | Lead Factor | Target Fluence (n/cm <sup>2</sup> ) | Withdrawal Time EFPY         | Lead Factor | Target Fluence (n/cm <sup>2</sup> ) |
| 1           | 83                       | Standby              | 1.15        | ----                                | 24                           | 1.21        | 3.8 x 10 <sup>19</sup>              |
| 2           | 97                       | 3.2                  | 1.15        | 3.4 x 10 <sup>18</sup>              | 2.85 (U2C4 refueling outage) | 1.21        | 3.4 x 10 <sup>18</sup>              |
| 3           | 104                      | 13.6                 | 1.15        | 1.6 x 10 <sup>19</sup>              | Standby                      | 0.86        | --                                  |
| 4           | 284                      | 24                   | 1.15        | 2.5 x 10 <sup>19</sup>              | Standby                      | 0.86        | --                                  |
| 5           | 263                      | Standby              | 1.15        | ----                                | 13.6                         | 1.21        | 2.3 x 10 <sup>19</sup>              |
| 6           | 277                      | Standby              | 1.15        | ----                                | Standby                      | 1.21        | --                                  |

\* Based on information collected from Unit 3 Capsule No. 2 with the exception of the target fluence for capsule 2, which was the original target fluence value.

San Onofre Unit 3 Comparison Table

| Original Information |                          |                      |             | Revised Information*                |                              |             |                                     |
|----------------------|--------------------------|----------------------|-------------|-------------------------------------|------------------------------|-------------|-------------------------------------|
| Capsule No.          | Azimuthal Location (deg) | Withdrawal Time EFPY | Lead Factor | Target Fluence (n/cm <sup>2</sup> ) | Withdrawal Time EFPY         | Lead Factor | Target Fluence (n/cm <sup>2</sup> ) |
| 1                    | 83                       | Standby              | 1.5         | ----                                | 24                           | 1.21        | 3.8 x 10 <sup>19</sup>              |
| 2                    | 97                       | 4.4                  | 1.5         | 6.0 x 10 <sup>18</sup>              | 4.33 (U3C5 refueling outage) | 1.21        | 6.0 x 10 <sup>18</sup>              |
| 3                    | 104                      | 15.2                 | 1.5         | 1.6 x 10 <sup>19</sup>              | Standby                      | 0.86        | --                                  |
| 4                    | 284                      | 24                   | 1.5         | 2.5 x 10 <sup>19</sup>              | Standby                      | 0.86        | --                                  |
| 5                    | 263                      | Standby              | 1.5         | ----                                | 15.2                         | 1.21        | 2.5 x 10 <sup>19</sup>              |
| 6                    | 277                      | Standby              | 1.5         | ----                                | Standby                      | 1.21        | --                                  |

\* Based on information collected from Unit 3 Capsule No. 2 with the exception of the target fluence for capsule 2, which was the original target fluence value.