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**Joseph Pollock**  
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March 4, 2010

NL-10-025

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

**SUBJECT:** Proposed Revision to Reactor Vessel Surveillance Capsule Withdrawal  
Schedule Per 10 CFR 50, Appendix H  
Indian Point Unit Number 2  
Docket No. 50-247  
License No. DPR-26

**REFERENCE:**

- 1 NRC Administrative Letter 97-04, "NRC Staff Approval For Changes to 10 CFR 50, Appendix H, Reactor Vessel Surveillance Specimen Withdrawal Schedules," dated September 30, 1997.
- 2 ASTM Standard E185, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels"

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. (Entergy) hereby requests NRC approval of a revision to the reactor vessel surveillance specimen withdrawal schedule in accordance with the provisions of 10 CFR 50, Appendix H, Section III.B.3. Reference 1 clarifies that NRC approval of the proposed changes to the withdrawal schedule do not require a license amendment if the changes conform to the American Society for Testing and Materials (ASTM) Standard E 185 (Reference 2). The proposed changes comply with Reference 2 as discussed in Attachment I.

Indian Point Unit 2 is currently getting ready to enter refuel outage 19 and the current schedule for removing the capsule is March 18, 2010.

ADD  
NRR

The proposed change revises the surveillance capsule withdrawal schedule to allow the flexibility to either withdraw capsule S which is currently classified as retired in place or to withdraw capsule U. Withdrawal of either capsule will not affect compliance with the requirements of ASTM E 185.

Entergy is making this request in order to attempt to remove capsule S based on Westinghouse information that the load capacity of the capsule removal tool has been upgraded and may overcome the inability in refuel outage (RFO) 16 to withdraw capsule S from its location in the vessel. The attempt to remove capsule S at this time is desirable because the capsule is the last one containing weld material and after this outage the capsule will have been exposed to fluence levels in excess of the limits provided in Table 1 of ASTM E 185-82 (i.e. two times the peak EOL vessel fluence). Entergy is requesting authorization to remove capsule S instead of capsule U by the scheduled capsule removal date of March 18, 2010.

There are no new commitments identified in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at (914) 734-6710.

Sincerely,

A handwritten signature in black ink, appearing to read "JEP/sp", with a stylized flourish at the end.

JEP/sp

Attachment 1. PROPOSED REVISION TO REACTOR VESSEL SURVEILLANCE  
CAPSULE WITHDRAWAL SCHEDULE PER 10 CFR 50, APPENDIX H

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL  
Mr. Samuel J. Collins, Regional Administrator, NRC Region 1  
NRC Resident Inspectors  
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA  
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT I TO NL-10-025

PROPOSED REVISION TO REACTOR VESSEL SURVEILLANCE  
CAPSULE WITHDRAWAL SCHEDULE PER 10 CFR 50, APPENDIX H

ENERGY NUCLEAR OPERATIONS, INC  
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2  
DOCKET NO. 50-247

## 1.0 REQUIREMENTS

Appendix H of 10 CFR 50 (Reference 1) describes reactor vessel material surveillance program requirements. Paragraph (III)(B)(3) requires "A proposed withdrawal schedule must be submitted with a technical justification as specified in Section 50.4. The schedule must be approved prior to implementation." Reference 2 allows NRC approval of the proposed changes to the withdrawal schedule without a license amendment if the changes conform with the American Society for Testing and Materials (ASTM) Standard E 185 (Reference 3).

## 2.0 PROPOSED CHANGES

The proposed change revises the withdrawal schedule for two of the surveillance capsules which remain in the reactor vessel by adding the flexibility to withdraw either capsule S or capsule U. The current schedule and proposed changes are identified in Tables 1 and 2, respectively.

Table 1 - Current Withdrawal Schedule

The following is a list of the surveillance program capsules along with the actual (past) and anticipated (future) withdrawal schedule based on the latest fluence and embrittlement calculations performed in accordance with the requirements of Regulatory Guide 1.99, Revision 2 (WCAP-15629).

Capsule	Location	Lead Factor	Withdrawal Date
T	320°	3.42	End of Cycle 1
Y	220°	3.48	End of Cycle 2
Z	40°	3.53	End of Cycle 5
V	4°	1.18	End of Cycle 8
S	140°	3.5	Retired in Place
U*	176°	1.2	End of Cycle 19
W*	184°	1.2	End of Life
X*	356°	1.2	Spare

\*The withdrawal schedule of these capsules is interchangeable due to common materials and lead factors.

Table 2 - Proposed Withdrawal Schedule

Capsule	Location	Lead Factor	Withdrawal Date
T	320°	3.42	End of Cycle 1
Y	220°	3.48	End of Cycle 2
Z	40°	3.53	End of Cycle 5
V	4°	1.18	End of Cycle 8
S	140°	3.5	Retired in Place**
U*	176°	1.2	End of Cycle 19**
W*	184°	1.2	End of Life
X*	356°	1.2	Spare

\*The withdrawal schedule of these capsules is interchangeable due to common materials and lead factors.

\*\* Capsule S may be withdrawn during the RFO19 if modified tooling capable of removing the capsule is available. If Capsule S is not withdrawn, then Capsule U (or W or X) will be withdrawn during the End of Cycle 19 refueling outage.

The following table provides detailed fluence levels for each of the capsules.

Table 3 – Capsule Fluence levels

Capsule	Capsule Location	Lead Factor	Withdrawal Outage	Withdrawal EFPY (vessel)	Capsule Fluence (n/cm <sup>2</sup> )
T	320°	3.42	RFO1	1.42	2.53 x 10 <sup>18</sup>
Y	220°	3.48	RFO2	2.34	4.55 x 10 <sup>18</sup>
Z	40°	3.53	RFO5	5.17	1.02 x 10 <sup>19</sup>
V	4°	1.18	RFO8	8.6	4.92 x 10 <sup>18</sup>
S	140°	3.5	*RFO19 or retired in place	26.0 (approx)	3.8 x 10 <sup>19</sup> (approx) ***
U**	176°	1.2	*RFO19 or Spare	26.0 (approx)	1.3 x 10 <sup>19</sup> (approx) ***
W**	184°	1.2	End of Life	EOL (32 EFPY)	1.5 x 10 <sup>19</sup>
X**	356°	1.2	N/A	Spare	N/A

Notes: \*Capsule S will be withdrawn if possible and if not then Capsule U (or W or X) will be withdrawn in RFO19.

\*\*The withdrawal schedule for these three capsules is interchangeable due to the common lead factor and the common materials in the capsules.

\*\*\* Fluence values obtained from Westinghouse letter IPP-01-079, dated April 26, 2001.

### 3.0 TECHNICAL ANALYSIS

This request proposes to revise the surveillance capsule withdrawal schedule to allow the attempted removal of capsule S which is currently retired in place, and to allow capsule U to be declared a spare if capsule S is successfully removed. If capsule S cannot be successfully removed then it will be maintained as retired in place. Westinghouse recently advised that they had increased the load capability of the capsule removal tool and believe that capsule S could now be removed. Capsule S was retired in RFO16 when the maximum tool removal load was reached and the capsule could not be withdrawn. The attempt to remove capsule S at this time is desirable since it is the last remaining capsule with weld material. Because of the high lead factor of 3.5, Capsule S will have been exposed to a fluence level of approximately 90 EFPY by RFO19. Additional fluence beyond these levels could result in exceeding the fluence limits provided in ASTM E 185 decreasing the usefulness of the data to assess future condition of the belt line materials.

The current withdrawal schedule was approved in 2004 when capsule S was stuck (Reference 4). The surveillance capsules are used to monitor the beltline materials. The surveillance capsules are located closer to the core than the reactor vessel beltline materials so that fracture toughness testing can be used to determine the nil-ductility transition temperature of the vessel at a later time in life.

10CFR50, Appendix H requires that the surveillance capsule program "...must 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". For IP2, this is the 1966 Edition of ASTM E 185. Appendix H also requires that "...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". Therefore, for IP2 the surveillance capsule withdrawal schedule is based on the 1966 Edition of ASTM E 185, although the IP2 schedule has been upgraded to meet the requirements of the 1982 Edition of ASTM E 185 to the extent practicable.

Since the peak  $\Delta RT_{PTS}$  increase due to fluence exceeds 200° F, ASTM E 185 requires that five capsules be withdrawn. To date, four capsules have been withdrawn (capsules T, Y, Z and V) with four capsules (i.e. capsules S, U, W and X) remaining in the vessel. Capsule W is currently scheduled to be the fifth (i.e. the EOL) capsule to satisfy the withdrawal requirements of ASTM E 185.

In addition to the requirements of ASTM E 185, capsule U is also scheduled to be withdrawn during the upcoming end of cycle 19 refueling outage. Since capsule U is not required to meet the requirements of ASTM E 185 (i.e. capsule U is the sixth capsule), allowing the flexibility of removing either capsule U or capsule S will have no adverse impact on compliance with the requirements of ASTM E 185 while allowing the weld and base material data contained in capsule S to be re-captured.

#### **4.0 REFERENCES**

1. 10 CFR 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements."
2. NRC Administrative Letter 97-04, "NRC Staff Approval For Changes to 10 CFR 50, Appendix H, Reactor Vessel Surveillance Specimen Withdrawal Schedules," dated September 30, 1997.
3. ASTM Standard E185, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels".
4. NRC letter dated November 16, 2004, Indian Point Nuclear Generating Unit No.2 regarding the Reactor Vessel Capsule Withdrawal Schedule Changes (TAC No. MC5059)