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March 8, 2010

NL-10-030

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

SUBJECT: Revised 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 Entergy Letter to NRC, NL-10-025, "Proposed Revision to Reactor
Vessel Surveillance Capsule Withdrawal," dated March 4, 2010.

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. (Entergy) requested, Reference 1, 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. Entergy discussed that request with the NRC in a telecom on March 5, 2010. A revision to the proposed surveillance capsule revision in reference 1 reflects that telecom. The acceptance criteria used for the surveillance capsule schedule revision remains the same. Approval is requested by March 18, 2010.

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NRR

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,


for J. Pollock

JEP/sp

Attachment 1. REVISED 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-10-030

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

ENTERGY 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 capsule S and designating capsule U as a spare. 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	Spare
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 not withdrawn no capsule is required. If withdrawn testing will be coordinated with the industry to optimize the usefulness of the test data.

***At end of life as currently licensed, Capsule W (or U or X) will be withdrawn.

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

Notes: *Capsule S will be withdrawn if possible and if not then retired in place

**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 cannot be successfully removed then it will be maintained as retired in place. It is desired to remove Capsule S at this time since its fluence exceeds 2 times the currently licensed life and exceeds the peak vessel fluence of 1.90×10^{19} at the end of the 48 EFPY projected if License renewal is granted. 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 ΔRT_{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), designating Capsule U as a spare, even if Capsule S cannot be withdrawn, will have no adverse impact on compliance with the requirements of ASTM E 185.

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)