



Nebraska Public Power District
Nebraska's Energy Leader

50.90

NLS2002104
December 31, 2002

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

Subject: License Amendment Request to Adopt an Integrated
Reactor Vessel Material Surveillance Program
Cooper Nuclear Station
NRC Docket No. 50-298, DPR-46

Reference: Letter from William H. Bateman (NRC) to Carl Terry (BWRVIP Chairman),
"Safety Evaluation Regarding EPRI Proprietary Reports 'BWR Vessel and
Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)' and
'BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance
Program Implementation Plan'," dated February 1, 2002.

The purpose of this letter is to request a change to the Cooper Nuclear Station (CNS) reactor vessel material surveillance program required by 10CFR50 Appendix H, Section III. This change will incorporate the Boiling Water Reactor Vessel & Internals Project (BWRVIP) Integrated Surveillance Program (ISP) into the CNS licensing basis.

10CFR50.60 requires that licensees establish and maintain a reactor vessel material surveillance program which meets the criteria of 10CFR50 Appendix H to monitor and evaluate the cumulative impact of neutron fluence on reactor vessel materials to ensure reactor vessel integrity. To date, CNS has maintained a "plant-specific" reactor vessel material surveillance program in accordance with those requirements. 10CFR50, Appendix H, Section III.C contains provisions and requirements for an integrated surveillance program. CNS is participating in the BWRVIP, which has developed an integrated surveillance program that meets the applicable 10CFR50, Appendix H requirements.

By letter dated February 1, 2002 (Reference), the Nuclear Regulatory Commission (NRC) issued a Safety Evaluation approving implementation of the BWRVIP ISP. As stated in the referenced Safety Evaluation, licensees that elect to participate in the BWRVIP ISP are required to submit a license amendment request to adopt the integrated surveillance program. Accordingly, this letter requests that NRC approve revision of the CNS licensing basis to adopt the BWRVIP ISP as its reactor vessel material surveillance program.

To document this change to the CNS licensing basis, anticipated changes to the CNS Technical Specification Bases are provided in Attachment 2. Adoption of the BWRVIP ISP into the CNS licensing basis per 10CFR50 Appendix H Section III.C will supersede existing licensing basis

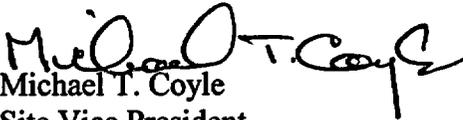
A001

commitments relating to the capsule withdrawal schedule and analysis. This information will be incorporated into the CNS Updated Safety Analysis Report in accordance with 10CFR50.71(e). Attachment 3 provides a markup of how the key elements of this proposed change are expected to be incorporated into the USAR. Approval of this proposed License Amendment is requested by December 31, 2003 to allow the Nebraska Public Power District to apply the results of the next ISP capsule test report, expected to be completed by February 2004.

This submittal has been reviewed by the appropriate safety review committee and incorporates amendments to the CNS Facility Operating License through Amendment 195 issued September 30, 2002. As described in Attachment 1, this License Amendment Request has been evaluated in accordance with 10CFR50.91(a)(1) using the criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards considerations. By copy of this letter, the appropriate State of Nebraska official is being notified in accordance with 10CFR50.91(b)(1). Copies to the Region IV Office and the CNS Resident Inspector are also being sent in accordance with 10CFR50.4(b)(1).

Should you have any questions regarding this matter, please contact Paul V. Fleming at (402) 825-2774.

Sincerely,


Michael T. Coyle
Site Vice President

/wrv

Attachments

**cc: Regional Administrator w/attachments
USNRC Region IV**

**Senior Project Manager w/attachments
USNRC - NRR Project Directorate IV-1**

**Senior Resident Inspector w/attachments
USNRC**

**Nebraska Health and Human Services w/attachments
Department of Regulation and Licensure**

NPG Distribution w/o attachments

Records w/attachments

STATE OF NEBRASKA)
)
NEMAHA COUNTY)

Michael T. Coyle, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this correspondence on behalf of the Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

Michael T. Coyle
Michael T. Coyle

Subscribed in my presence and sworn to before me this 31st day of December, 2002.

LuAnn Bray
NOTARY PUBLIC



**LICENSE AMENDMENT REQUEST TO ADOPT AN
INTEGRATED REACTOR VESSEL
MATERIAL SURVEILLANCE PROGRAM**

1.0 INTRODUCTION

This letter requests a change to the Cooper Nuclear Station (CNS) licensing basis to allow participation in the Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) in lieu of the site specific program currently in place. The attached Technical Specifications Bases markup documents the requested change. Upon approval of this License Amendment Request, the Nebraska Public Power District (NPPD) will revise the CNS Updated Safety Analysis Report (USAR) to reflect this new licensing basis information in accordance with 10CFR50.71(e).

2.0 DISCUSSION

10CFR50 Appendix H, Section III.B establishes surveillance program criteria for licensee monitoring of reactor pressure vessel (RPV) beltline regions in conformance with ASTM E-185, as modified by Appendix H. ASTM E-185 provides guidelines for designing a minimum surveillance program, selecting materials, and evaluating test results for light-water cooled nuclear power reactor vessels. It also provides recommendations for the minimum number of surveillance capsules and their withdrawal schedules. 10CFR50 Appendix H requires that the proposed withdrawal schedule be submitted with a technical justification and approved prior to implementation.

The CNS reactor pressure vessel material surveillance program was originally designed to be in conformance with the 1973 edition of ASTM E-185 to the degree possible, and was found by the Atomic Energy Commission to comply with then proposed 10CFR50 Appendix H. In License Amendment 143, the Nuclear Regulatory Commission (NRC) concluded that the surveillance program was consistent with ASTM E-185-82 and 10CFR50 Appendix H. The current surveillance capsule withdrawal schedule is provided in Section IV-2.7.2.13 of the CNS USAR.

To address industry issues concerning availability and use of surveillance specimens that best represent BWR fleet limiting reactor vessel beltline materials, the BWRVIP developed an ISP and submitted it to the NRC for approval. The ISP was developed in response to an issue raised by the NRC staff regarding the potential lack of adequate unirradiated baseline Charpy V-notch (CVN) data for one or more materials in plant-specific surveillance programs at several BWRs. The lack of baseline properties would inhibit a licensee's ability to effectively monitor changes in the fracture toughness properties of RPV materials in accordance with Appendix H to 10CFR50. The BWRVIP ISP was developed to resolve this issue.

In Reference 1, the NRC Staff documented acceptance of the BWRVIP ISP plan. The NRC Staff concluded that the proposed BWRVIP ISP Plan was acceptable for BWR licensee

implementation provided that all licensees use compatible methodologies acceptable to the NRC staff to determine surveillance capsule and RPV neutron fluences. The staff also required licensees who elect to participate in the ISP to submit a license amendment to the NRC to revise their licensing basis accordingly.

The first CNS surveillance capsule to be tested under the ISP is a Supplemental Surveillance Program capsule that will be withdrawn in March 2003. This capsule was installed in the CNS RPV as part of an earlier BWR Owners Group (BWROG) program to obtain additional data for some reactor vessel materials. The BWRVIP ISP test report for this capsule is scheduled to be submitted to the NRC no later than one year after the withdrawal date, in accordance with 10CFR50 Appendix H.

As discussed in License Amendment 155, Figures 3.4.9-1, 2, and 3 of the CNS Technical Specifications provides pressure/temperature (P/T) curves valid to 21 Effective Full Power Years (EFPY) of operation. New fluence analysis work will be conducted in accordance with the recommendations of Regulatory Guide (RG) 1.99 Revision 2 and applied with the RPV surveillance capsule testing results/data that will be available through the BWRVIP ISP in 2004. NPPD will revise the existing CNS P/T Limit Curves, as necessary, based on the results of this updated fluence analysis and testing.

2.1 Technical Analysis

Implementation of the ISP will provide several benefits. When the original surveillance materials were selected for vessel surveillance programs, the state of knowledge concerning the RPV material response to irradiation and post-irradiation fracture toughness was not what it is today. As a result, many facilities did not include what would be identified today as the plant's limiting RPV materials in their surveillance programs. Therefore, the BWRVIP effort to identify and evaluate materials from other BWRs that may better represent a facility's limiting materials should improve the overall evaluation of BWR RPV embrittlement. In addition, the inclusion of data from the testing of BWROG Supplemental Surveillance Program capsules will improve overall quality of the data being used to evaluate BWR RPV embrittlement. Finally, implementation of the ISP is expected to reduce the cost of surveillance testing and analysis for the BWR fleet since surveillance materials that are of little or no value (either because they lack adequate unirradiated baseline CVN data or because they are not the best representative materials) will no longer be tested.

The NRC's Safety Evaluation of the BWRVIP ISP (Reference 1) concludes that the proposed ISP, if implemented in accordance with the conditions in the Safety Evaluation, is an acceptable alternative to existing BWR plant-specific RPV surveillance programs for the purpose of maintaining compliance with the requirements of 10CFR50 Appendix H through the end of current facility 40 year operating licenses. Reference 1 requires that each licensee provide sufficient information for the NRC to determine that (1) RPV and surveillance capsule fluences will be established by use of an NRC-approved fluence methodology that provides results determined to be acceptable based on the available dosimetry data, and (2) if one methodology is

used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation). In Reference 2, the BWRVIP proposed a means of satisfying these Safety Evaluation conditions. In Reference 4, the NRC found these courses of action acceptable. Accordingly, NPPD is ensuring, through participation in the BWRVIP, that fluence calculations applicable to CNS will be performed in accordance with the guidance contained in RG 1.190. Fluence recalculations will be performed for previously withdrawn capsules using RG 1.190 methodology by February 2004, which is the anticipated submittal date for the next capsule withdrawal test report. Since CNS is a host reactor and will only be relying on test specimens irradiated within the CNS RPV using a RG 1.190 fluence methodology, the compatibility concerns of Reference 1 are not applicable.

3.0 DESCRIPTION OF CHANGES

Attachment 2 provides the proposed Technical Specification Bases changes that will reflect adoption of the ISP. Compliance with 10CFR50 Appendix H, Section III.C via BWRVIP-86-A, April 2002 (Reference 3), which includes the NRC Safety Evaluation and the effects of NRC information requests on the proposed ISP, will supersede the existing licensing basis designed around conformance with 10CFR50 Appendix H, Section III.B. Following NRC approval, the USAR will be updated to reflect the following key elements of the revised licensing basis, in accordance with 10CFR50.71(e):

- Document CNS adoption of the ISP, whose program documents consist of BWRVIP-78, December 1999, and BWRVIP-86-A, April 2002.
- Replacement of the existing ASTM E-185-82 capsule withdrawal schedule with reference to the capsule withdrawal schedule developed by the ISP.
- Commitment to RG 1.190 for fluence calculations of ISP capsules and for recalculations of previously withdrawn CNS capsules.

Attachment 3 provides a USAR markup describing how these elements of the ISP are expected to be incorporated based on the existing text. However, it should be noted that the final USAR changes resulting from adopting the ISP will include other ancillary changes necessary for 10CFR50.71(e) compliance that may affect the location and structure of the changes provided in the Attachment.

This change from the existing surveillance program to the ISP would normally be addressed as part of the 10CFR50.59 process for USAR revisions. However, in accordance with the NRC Safety Evaluation approving implementation of the BWRVIP ISP (Reference 1), this change is being processed as a license amendment to facilitate site-specific NRC review and approval.

4.0 NO SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

In accordance with 10CFR50.92, a proposed change to the operating facility involves no “significant hazards” if operation of the facility, in accordance with the proposed change, would not 1) involve a significant increase in the probability or consequences of any accident previously evaluated, 2) create the possibility of a new or different kind of accident from any accident previously evaluated, or 3) involve a significant reduction in a margin of safety.

NPPD has evaluated the no significant hazards consideration in this request for a license amendment and have determined that no significant hazards consideration results from the proposed change. The no significant hazards evaluation follows.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

Pressure-temperature (P/T) limits (CNS Technical Specifications Figures 3.4.9-1, 2, and 3) are imposed on the reactor coolant system to ensure that adequate safety margins against non-ductile or brittle fracture exist during normal operation, anticipated operational occurrences, and system hydrostatic tests. The P/T limits are based on the nil-ductility reference temperature, RT_{NDT} , as described in ASME Section XI, Appendix G. Changes in the fracture toughness properties of RPV beltline materials, resulting from the neutron irradiation and the thermal environment, are monitored by a surveillance program in compliance with the requirements of 10CFR50 Appendix H. The effect of neutron fluence on the shift in the RT_{NDT} of RPV materials is predicted by methods given in RG 1.99, Revision 2.

This change is not related to any accidents previously evaluated. Rather, the reactor vessel surveillance program, corresponding material evaluations, and adjustment of a plant’s P/T limits, as necessary, protect against the possibility of reactor vessel brittle fracture. Monitoring, evaluation, and adjustment of CNS P/T limits to ensure adequate margin exists to brittle fracture will continue. This change only replaces a plant-specific monitoring and evaluation program with an integrated industry program, the BWRVIP ISP. The NRC has reviewed this program and approved it for implementation in a Safety Evaluation, dated February 1, 2002.

CNS’s current P/T limits were established based on adjusted reference temperatures developed in accordance with the procedures described in RG 1.99, Revision 2. Calculation of adjusted reference temperature by these procedures includes a margin term to ensure conservative, upper-bound values are used for the calculation of the P/T limits. This change does not affect the existing P/T limits in the CNS Technical Specifications Figures 3.4.9-1, 2, and 3. This change will not affect any plant safety limits or limiting conditions of operation. The proposed change will not affect reactor pressure vessel

performance as no physical changes are involved aside from changes related to surveillance capsule withdrawal, and CNS vessel P/T limits will remain conservative in accordance with RG 1.99, Revision 2 criteria. The proposed change will not cause the reactor pressure vessel or interfacing systems to be operated outside of their design or testing limits. Also, the proposed change will not alter any assumptions previously made in evaluating the radiological consequences of accidents. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change revises the CNS license basis to reflect participation in the BWRVIP ISP. Participation in the BWRVIP ISP will continue to ensure that the CNS reactor vessel materials are monitored and evaluated as necessary to protect against brittle fracture. This proposed change does not involve a modification of the design of plant structures, systems, or components. The proposed change will not impact the manner in which the plant is operated as plant operating and testing procedures will not be affected by the change. The proposed change will not degrade the reliability of structures, systems, or components important to safety as equipment protection features will not be deleted or modified, equipment redundancy or independence will not be reduced, supporting system performance will not be downgraded, the frequency of operation of equipment will not be increased, and increased or more severe testing of equipment will not be imposed. No new accident types or failure modes will be introduced as a result of the proposed change. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from that previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

Conformance with 10CFR50 Appendix G defines the accepted safety margin for Reactor Coolant Pressure Boundary fracture toughness. The P/T limits are not derived from Design Basis Accident (DBA) analyses. They are prescribed during normal operation to avoid encountering pressure, temperature, and temperature rate of change conditions that might cause undetected flaws to propagate and cause nonductile failure of the reactor pressure vessel, a condition that is unanalyzed. Since the P/T limits are not derived from any DBA, there are no acceptance limits related to the P/T limits. Rather the P/T limits are acceptance limits themselves since they preclude operation in an unanalyzed condition.

This proposed change will not alter the required margins as defined in 10CFR50, Appendix G. This proposed change will not affect any safety limits, limiting safety system settings, or limiting conditions of operation. The proposed change does not represent a change in initial conditions, or in a system response time, or in any other parameter affecting the course of an accident analysis supporting the Bases of any Technical Specification. The proposed change does not involve revision of the P/T limits. Rather, this change involves a revision to the surveillance capsule withdrawal schedule, a revision to the reactor vessel fluence calculational methodology to achieve consistency within the BWRVIP ISP, and participation in future BWRVIP ISP developments. The current P/T limits were established based on adjusted reference temperatures for vessel beltline materials calculated in accordance with RG 1.99, Revision 2 which will continue to conform to 10CFR50 Appendix G. Therefore, the proposed change does not involve a significant reduction in any safety margins.

In summary, it is concluded that this License Amendment Request does not involve significant hazards consideration results. NPPD has researched the existing regulatory precedent and has identified five BWR licensees with similar License Amendment Requests currently under NRC staff review:

- Browns Ferry Units 2 and 3- Submittal date November 6, 2002
- Monticello Generating Station- Submittal date September 19, 2002
- River Bend- Submittal date August 15, 2002
- Fermi Unit 2- Submittal date August 8, 2002
- Susquehanna Units 1 and 2- Submittal date July 25, 2002

5.0 ENVIRONMENTAL CONSIDERATIONS

NPPD has reviewed this License Amendment Request against the criteria of 10CFR51.22 for environmental considerations. Since this request involves (i) no significant hazard consideration, (ii) no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, and (iii) no significant increase in individual or cumulative occupational radiation exposure, NPPD has concluded that the proposed change meets the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an environmental impact statement.

6.0 REFERENCES

1. Letter from William H. Bateman (NRC) to Carl Terry (BWRVIP Chairman), "Safety Evaluation Regarding EPRI Proprietary Reports 'BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)' and 'BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan,'" dated February 1, 2002.

2. Letter from Carl Terry (BWRVIP Chairman) to Document Control Desk (NRC), "Project No. 704 – BWRVIP Response to NRC Safety Evaluation of the BWR Integrated Surveillance Program," dated April 29, 2002.
3. BWRVIP-86-A: "BWR Vessel and Internals Project, BWR Integrated Surveillance Program (ISP)," Final Report, April 2002.
4. Letter from William H. Bateman (NRC) to Carl Terry (BWRVIP Chairman), "BWRVIP Response to NRC Safety Evaluation Regarding the BWR Integrated Surveillance Program," dated May 28, 2002.

NLS2002104
Attachment 2

**LICENSE AMENDMENT REQUEST TO ADOPT AN
INTEGRATED REACTOR VESSEL
MATERIAL SURVEILLANCE PROGRAM**

**AFFECTED TECHNICAL SPECIFICATION BASES
COOPER NUCLEAR STATION
NRC DOCKET NO. 50-298, LICENSE DPR-46**

MARKUP COPY

1. **Technical Specification Bases B 3.4.9**

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 RCS Pressure and Temperature (P/T) Limits

BASES

BACKGROUND

All components of the RCS are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This LCO limits the pressure and temperature changes during RCS heatup and cooldown, within the design assumptions and the stress limits for cyclic operation.

This Specification contains P/T limit curves for heatup, cooldown, and inservice leakage and hydrostatic testing, criticality, and data for the maximum rate of change of reactor coolant temperature.

Each P/T limit curve defines an acceptable region for normal operation. The usual use of the curves is operational guidance during heatup or cooldown maneuvering, when pressure and temperature indications are monitored and compared to the applicable curve to determine that operation is within the allowable region.

The LCO establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary (RCPB). The vessel is the component most subject to brittle failure. Therefore, the LCO limits apply mainly to the vessel.

10 CFR 50, Appendix G (Ref. 1), requires the establishment of P/T limits for material fracture toughness requirements of the RCPB materials. Reference 1 requires an adequate margin to brittle failure during normal operation, abnormal operational transients, and system hydrostatic tests. It mandates the use of the ASME Code, Section III, Appendix G (Ref. 2).

The actual shift in the RT_{NDT} of the vessel material will be established periodically by removing and evaluating the irradiated reactor vessel material specimens, in accordance with ~~ASTM E 185~~ BWRVIP-86-A (Ref. 3) and Appendix H of 10 CFR 50 (Ref. 4). The operating P/T limit curves will be adjusted,

(continued)

BASES

**SURVEILLANCE
REQUIREMENTS**

SR 3.4.9.5, SR 3.4.9.6, and SR 3.4.9.7 (continued)

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

SR 3.4.9.5 is modified by a Note that requires the Surveillance to be performed only when tensioning the reactor vessel head bolting studs. SR 3.4.9.6 is modified by a Note that requires the Surveillance to be initiated 30 minutes after RCS temperature $\leq 90^{\circ}\text{F}$ in MODE 4. SR 3.4.9.7 is modified by a Note that requires the Surveillance to be initiated 12 hours after RCS temperature $\leq 100^{\circ}\text{F}$ in MODE 4. The Notes contained in these SRs are necessary to specify when the reactor vessel flange and head flange temperatures are required to be within the specified limits.

REFERENCES

1. 10 CFR 50, Appendix G.
 2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
 3. ASTM-E 185-73 BWRVIP-86-A, April 2002.
 4. 10 CFR 50, Appendix H.
 5. Regulatory Guide 1.99, Revision 2, May 1988.
 6. USAR, Section IV-2.6.
 7. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
 8. 10 CFR 50.36(c)(2)(ii).
 9. USAR, Appendix G.
-
-

NLS2002104
Attachment 3

LICENSE AMENDMENT REQUEST TO ADOPT AN
INTEGRATED REACTOR VESSEL
MATERIAL SURVEILLANCE PROGRAM

KEY USAR CHANGES
COOPER NUCLEAR STATION
NRC DOCKET NO. 50-298, LICENSE DPR-46

MARKUP COPY

1. USAR Section 2.7.2.13

2.7.2.12 Corrosion-Resistant Reactor Vessel Materials

The vessel wall and all test specimens are low alloy ferritic steel.^[8]

2.7.2.13 Specimen Withdrawal Schedule

The original surveillance program was designed with three capsules containing Charpy, tensile, and flux wire specimens, with an additional flux wire dosimeter. The flux wire dosimeter was withdrawn after the first fuel cycle to establish the relationship between flux and thermal power.

The first surveillance capsule was withdrawn during the Reload 9 Cycle 10 refueling outage in 1985 following 6.8 Effective Full Power Years (EFPY) of operation. The surveillance capsule was then sent to GE's Vallecitos Nuclear Center for testing and analysis. Following this testing and analysis, the District submitted Proposed Change No. 48 to the CNS Technical Specifications to revise the vessel pressure-temperature curves to reflect the surveillance specimen testing results.^[74] The pressure-temperature curves were based on the Regulatory Guide 1.99 Revision 1 prediction methods; however, the Regulatory Guide 1.99 Revision 1 results were adjusted to account for the high transition temperature shift measured during testing of the surveillance specimens. In 1988, the NRC issued Amendment No. 120 to the CNS operating license to incorporate the new Pressure-Temperature curves.^[75]

The NRC noted during their evaluation of Proposed Change No. 48 that the original CNS surveillance program was based on the original assumptions that the increase in reference temperature resulting from neutron exposure would be less than 100°F and that the surveillance specimen exposure would be greater than the vessel wall. However, analysis of the first surveillance capsule indicated that the surveillance specimen fluence lags that of the vessel wall, and that the increase in reference temperature would be greater than 100°F at end of life. ASTM E-185-1982 recommends that the surveillance capsule lead factors (the ratio of the instantaneous neutron flux density at the specimen location to the maximum calculated neutron flux density at the inside surface of the reactor vessel wall) be in the range of one to three. ASTM E-185-1982 also recommends a minimum number of four surveillance capsules to be included in the surveillance program for a predicted end of life transition temperature shift between 100°F and 200°F, with withdrawal schedules of three, six, and fifteen EFPY for the first three capsules, with the last capsule to be removed at end of life.

Based on the above, the NRC recommended that to meet as closely as possible the intent of ASTM E-185-1982, that the withdrawal schedule for the second capsule be accelerated to 12 EFPY, and the schedule for the third capsule be determined based on the analysis of the second capsule. The NRC also recommended that the District consider possible insertion of a fourth capsule into the CNS vessel, possible with reconstituted specimens from an earlier capsule. With respect to the statement "sample containers can be withdrawn but not replaced" found in USAR Section IV-2.7.2.11, Test Capsules, the reinsertion of a fourth capsule into the vessel as recommended by the NRC was only performed for the reconstituted second specimen to bring CNS in accordance with ASTM E-185-1982. Following various communications, in 1991, the District committed to 1) remove the second surveillance capsule during the Reload 14, Cycle 15 refueling outage during 1991 (following approximately 11 EFPY of operation), and 2) reconstitute the specimens from this capsule and re-insert the reconstituted specimens during the Reload 15, Cycle 16 refueling outage. The District also indicated that the withdrawal schedule for the third capsule will be based on the results of testing the second surveillance capsule.^[76]

USAR

In its safety evaluation accompanying Amendment No. 143 to the CNS operating license which extended the CNS license expiration date to January 18, 2014, ^[77] the NRC acknowledged the District's commitment to reconstitute the surveillance capsule withdrawn during the 1991 refueling outage. The NRC stated further that the reconstitution of the capsule withdrawn in 1991 is equivalent to a fourth capsule and thereby makes the District's surveillance program consistent with the requirements of ASTM E-185-1982 and 10 CFR Part 50 Appendix H. The NRC also acknowledged that the withdrawal schedule for the original third capsule and the reconstituted fourth capsule should be based on the results of the analysis of the second capsule.

The District withdrew the second surveillance capsule from the CNS reactor vessel during the 1991 refueling outage following 11.2 EFPY of operation. The results of testing and analysis of those surveillance materials are documented in General Electric Report (GE) GE-NE-523-159-1292 submitted to the NRC by letter dated February 25, 1993. The GE analysis was based on RG 1.99, Revision 2, which became effective in May 1988. In letter dated December 13, 1996 (NLS960232) and supplemented by letter dated April 17, 1997 (NLS970070), CNS requested a revision of the reactor vessel surveillance withdrawal schedule. In its subsequent SER dated May 7, 1997, the NRC concluded that the revised withdrawal schedule is in compliance with the requirements of 10 CFR Part 50, Appendix H and is consistent with the CNS licensing basis.

CNS has adopted the Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) as its current licensing basis for specimen withdrawal and testing. The BWRVIP meets the requirements of 10CFR50 Appendix H, Section III.C. The ISP program documents are BWRVIP-78, December 1999, and BWRVIP-86-A, April 2002. The schedule for the remaining capsules is provided in BWRVIP-86-A. As part of the ISP, CNS capsules are evaluated using fluence calculations that conform with Regulatory Guide 1.190. Recalculation of fluences for previously pulled capsules are also in conformance with Regulatory Guide 1.190.

~~Therefore, the schedule for the remaining capsules is as follows:~~

~~Third Capsule - 22 EFPY or as determined from the results of testing second capsule~~

~~Fourth Capsule - End of life (32 EFPY)~~

~~This schedule follows the withdrawal schedule provided in ASTM E-185-1982 except as qualified above for the third capsule.~~

~~To summarize CNS's reactor vessel material surveillance program, a program required by 10 CFR Part 50, Appendix H, the licensee's withdrawal schedule complies with ASTM E-185-66, the standard to which the vessel was purchased, and surveillance program withdrawal standards E185-73 and E185-1982 to the degree possible. ASTM E185-1982 standard now requires that a licensee's surveillance program be based on a minimum of four surveillance capsules which the earlier E185-73 edition did not. As a result of the previously analyzed two specimens and the remaining two capsules in the vessel which are scheduled for analysis as indicated above, CNS is in compliance with all three standards mentioned above, with 10 CFR Part 50, Appendix H and with the facility's licensing basis.~~

