

June 26, 2001

Mr. H. L. Sumner, Jr.
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Hatch Project
Southern Nuclear Operating
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Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: REACTOR VESSEL SURVEILLANCE CAPSULE WITHDRAWAL SCHEDULE -
EDWIN I. HATCH NUCLEAR PLANT, UNIT 2 (TAC NO. MB1908)

Dear Mr. Sumner:

By letter dated May 8, 2001, you submitted for NRC review and approval a request to modify the Hatch Unit 2 reactor pressure vessel surveillance capsule withdrawal schedule. The proposed change would defer the withdrawal of the second Hatch Unit 2 surveillance capsule from the scheduled refueling outage in Fall 2001 (equivalent to approximately 16.2 effective full-power years (EFPY) of operation) until the Spring 2003 refueling outage (equivalent to approximately 17.7 EFPY of operation). Your submittal was made in accordance with the provision of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, paragraph B.3 which specifies that "[a] proposed withdrawal schedule must be submitted with a technical justification as specified in [10 CFR 50.4]. The proposed schedule must be approved prior to implementation."

The staff has completed its evaluation of the your submittal, and the staff has concluded that the proposed changes to the Hatch Unit 2 reactor pressure vessel surveillance capsule withdrawal schedule are acceptable. The enclosed safety evaluation provides the details of the staff's conclusions on this issue.

Sincerely,

/RA/

Leonard N. Olshan, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-366

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST TO AMEND FACILITY'S REACTOR PRESSURE VESSEL

SURVEILLANCE CAPSULE WITHDRAWAL SCHEDULE

EDWIN I HATCH NUCLEAR PLANT, UNIT 2

SOUTHERN NUCLEAR OPERATING COMPANY

DOCKET NO. 50-366

1.0 INTRODUCTION

By letter dated May 8, 2001, Southern Nuclear Operating Company (SNC, the licensee) submitted for NRC review and approval a request to modify the Edwin I. Hatch Nuclear Plant, Unit 2, (Hatch Unit 2) reactor pressure vessel (RPV) surveillance capsule withdrawal schedule (Ref. 1). The proposed change would defer the withdrawal of the second Hatch Unit 2 surveillance capsule from the scheduled refueling outage in Fall 2001 (equivalent to approximately 16.2 effective full-power years (EFPY) of operation) until the Spring 2003 refueling outage (equivalent to approximately 17.7 EFPY of operation). SNC's submittal was made in accordance with the provision of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, paragraph B.3 which specifies that "[a] proposed withdrawal schedule must be submitted with a technical justification as specified in [10 CFR 50.4]. The proposed schedule must be approved prior to implementation."

2.0 REGULATORY REQUIREMENTS AND STAFF POSITIONS

Nuclear power plant licensees are required by Appendix H to 10 CFR Part 50 to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region...which result from exposure of these materials to neutron irradiation and the thermal environment." Regarding RPV surveillance program design and specimen testing, Appendix H to 10 CFR Part 50 incorporates by reference the editions of the American Society for Testing and Materials (ASTM) Standard Practice E 185, "Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," through the 1982 edition. Under Appendix H to 10 CFR Part 50, the licensee's RPV surveillance program design and withdrawal schedule is required to meet the requirements of the edition of ASTM E 185 that is current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the RPV was purchased, although later editions may be used, up to and including the 1982 edition. The test procedures and reporting requirements must, however, meet the requirements of the 1982 edition of ASTM E 185 to the extent practical for the configuration of the specimens in the capsules.

The edition of the ASME Code to which the Hatch Unit 2 RPV was purchased was the 1968 Edition, including the Summer 1970 Addenda, and the edition of ASTM E 185 to which the Hatch Unit 2 RPV surveillance program was designed was the 1966 edition (ASTM E 185-66) (Ref. 2). ASTM E 185-66 sets forth general requirements regarding the withdrawal schedule for RPV surveillance capsule programs. Paragraph 4.6 of ASTM E 185-66 states, “[i]t is recommended that sets of specimens be withdrawn at three or more separate times. One of the data points obtained shall correspond to the neutron exposure of the component near the end of its design life.” Hence, the ASTM E185-66 would impose no specific withdrawal requirement for the removal of the second Hatch Unit 2 capsule.

Additional NRC staff guidance has been published regarding licensee requests to obtain capsule withdrawal deferrals of one cycle to support the Integrated Surveillance Program (ISP) proposed by the Boiling Water Reactor Vessel and Internals Project (BWRVIP). The ISP withdrawal schedule proposed by the BWRVIP was originally submitted in topical report BWRVIP-78, updated in topical report BWRVIP-86, and modified in the most recent BWRVIP request for additional information response (Ref. 2-4). The ISP was designed to integrate and share data from the surveillance programs from all existing BWRs in the United States. The BWRVIP noted that, for some licensees, it would be necessary to obtain capsule deferrals of at least one cycle to support obtaining high quality data from some existing surveillance capsules. In addition, since some existing surveillance capsules would not need to be tested if the ISP were approved by the staff, licensees having such capsules desired to seek deferral of their removal and testing to reduce monetary expenditures and personnel exposure. The NRC staff has noted its general support for the ISP proposal, and, by letter to the BWRVIP, dated May 16, 2000, identified criteria to be addressed by licensees requesting capsule deferrals of one cycle to support the ISP (Ref. 5).

The first criterion addressed in the staff’s May 16, 2000, letter requested that licensees explain how their deferral request is consistent with the ISP plan submitted in topical report BWRVIP-78 (which would at this time be superceded by the information submitted in References 3 and 4). Principally, this criterion requested that licensees examine how their surveillance capsules would be used (or not used) under the proposed ISP and confirm that their request for a deferral of one cycle would not affect the ability of the ISP to meet its objectives. The second criterion requested that licensees provide a justification as to why the material property data to be acquired from the capsule in question was not necessary to support safe operation of the facility over the period of the deferral. Several options were given in the staff’s letter regarding possible responses to this criterion. Finally, the staff’s third criterion requested that licensees explain why the dosimetry data to be acquired from the capsule in question was not necessary to support safe operation of the facility over the period of the deferral.

3.0 LICENSEE’S DETERMINATION

In its May 8, 2001, letter, SNC stated that the reason for requesting this deferral of the second Hatch Unit 2 surveillance capsule was to support SNC’s involvement in the ISP. SNC then addressed, as described below, the three criteria cited in the NRC staff’s May 16, 2000, letter.

Regarding the first criterion, SNC noted that the Hatch Unit 2 surveillance capsules would be included within the ISP proposed by the BWRVIP. SNC noted that, based upon the proposed ISP withdrawal schedule that was current at the time of the submittal, the second Hatch Unit 2 surveillance capsule is to be withdrawn in 2004. Thus, the licensee concluded that deferral of

the second Hatch Unit 2 surveillance capsule until the unit's Spring 2003 refueling outage would be consistent with the withdrawal schedule of the BWRVIP's proposed ISP.

To address the second criterion, SNC noted that the material test data from the capsule to be deferred was not necessary to ensure continued safe operation of the Hatch Unit 2 RPV. SNC noted that using the predictive models of NRC Regulatory Guide 1.99, Revision 2 (RG 1.99, Rev. 2), the surveillance weld and surveillance plate for Hatch Unit 2 were predicted to exhibit 30.7 °F and 23.4 °F, respectively, of Charpy V-notch transition temperature shift after 18 EFPY of operation (this value was used since it bounds the projected condition of the surveillance materials at the time of the Fall 2001 outage (16.2 EFPY)). Shifts of this magnitude are not predicted to be large enough to be distinguishable from the scatter in the Charpy test method (56 °F and 34 °F for welds and plates, respectively) and, hence, are of limited value in assessing the embrittlement state of the RPV.

Finally, regarding the third criterion, SNC concluded that the dosimetry information from the capsules to be deferred was not necessary to ensure continued safe operation of the Hatch Unit 2 RPV. SNC noted that the operating time for the Hatch Unit 2 RPV at the end of the proposed deferral period will be 17.7 EFPY. Since the current Hatch Unit 2 pressure-temperature (P-T) limits were approved through 54 EFPY of operation and are not defined based upon the material properties of a beltline material, SNC concluded that this indicated that the deferral will not impact their adequacy.

For these reasons, SNC concluded that its request to defer withdrawal of the second Hatch Unit 2 surveillance capsule was justified and consistent with SNC's intent to support the BWRVIP ISP.

4.0 STAFF EVALUATION

The NRC staff reviewed the information supplied by the licensee and the regulatory requirements and guidance stated in section 2.0 above. The staff's conclusions on the technical justifications provided in response to the three criteria given in the NRC staff's May 16, 2000, letter are given below.

First, the staff accepts that deferral of the second Hatch Unit 2 capsule is acceptable within the BWRVIP ISP plan. The staff noted that in the most recent revision of the proposed ISP withdrawal schedule (which postdated the licensee's submittal), the second Hatch Unit 2 surveillance capsule is to be withdrawn in 2017 instead of 2004 (Ref. 4). This change was incorporated to increase the projected capsule fluence to levels which would be more representative of the RPVs which the capsule materials are to represent. Therefore, the licensee's request to defer the second capsule for withdrawal during the unit's Spring 2003 refueling outage (corresponding to 17.7 EFPY) is acceptable since the requested deferral does not exceed the 2017 withdrawal date specified in the proposed ISP.

Second, the staff accepts the justification provided by the licensee in response to why the material property information from the second surveillance capsule is not necessary to support safe operation of the Hatch Unit 2 RPV through the period of the deferral. When data from a capsule is not expected to be distinguishable from the scatter in the Charpy test method, this constitutes an acceptable technical justification for capsule deferral since the data would not be expected to provide information which would support a modification to the assessment of the

embrittlement of the RPV. Hence, continued operation of the RPV based on the use of P-T limit curves developed from the application of the generic embrittlement models given in Regulatory Guide 1.99, Rev. 2, as is the case with Hatch Unit 2, is acceptable through the period of the deferral.

Finally, regarding the third criterion, the staff agrees that since the existing Hatch Unit 2 P-T limit curves have been found to be acceptable for up to 54 EFPY of operation and are not based on a limiting beltline material, SNC is justified in operating the Hatch Unit 2 RPV through the requested period of capsule deferral without the need to acquire the dosimetry data from the second Hatch Unit 2 capsule.

5.0 CONCLUSION

The NRC staff has concluded that deferral of the withdrawal of the second Hatch Unit 2 surveillance capsule for one cycle is acceptable. This approved change modifies the time of withdrawal of the second surveillance capsule until the unit's Spring 2003 refueling outage (17.7 EFPY of operation). The licensee should be permitted to modify the withdrawal schedule of their RPV surveillance program to reflect this change.

6.0 REFERENCES

1. H. L. Sumner, Jr. [SNC] to U.S. Nuclear Regulatory Commission Document Control Desk, "Edwin I. Hatch Nuclear Plant, Deferral of Unit 2 RPV Surveillance Capsule Removal," May 8, 2001.
2. Topical Report BWRVIP-78, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)," December 1999.
3. Topical Report BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," December 2000.
4. C. Terry (BWRVIP) to U.S. Nuclear Regulatory Commission Document Control Desk, "PROJECT NO. 704 - BWRVIP Response to Second NRC Request for Additional Information on the BWR Integrated Surveillance Program," May 30, 2001.
5. J.R. Strosnider (USNRC) to C. Terry (BWRVIP), "BWR Integrated Surveillance Program (BWRVIP-78) (TAC No. M99894)," May 16, 2000.

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Date: June 26, 2001

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