

October 22, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: REQUEST TO MODIFY THE DRESDEN NUCLEAR POWER STATION, UNITS 2
AND 3, REACTOR VESSEL SURVEILLANCE CAPSULE WITHDRAWAL
SCHEDULE (TAC NOS. MB2087 AND MB2088)

Dear Mr. Kingsley:

By letter dated May 23, 2001, Exelon Generation Company, LLC (Exelon, the licensee), submitted, for the Nuclear Regulatory Commission (NRC) staff review and approval, a request to modify the Dresden Nuclear Power Station, Units 2 and 3, reactor pressure vessel surveillance capsule withdrawal schedules. The proposed change would defer the next withdrawal of surveillance capsules, currently scheduled for about 19 effective full-power years (EFPY) of operation, until 21.6 EFPY for Dresden Unit 2 (in October 2003) and 20.9 EFPY for Unit 3 (in October 2004). Exelon's submittal was made in accordance with the provision of Title 10 of the Code of Federal Regulations, Part 50, Appendix H, 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 NRC staff has completed its evaluation of Exelon's submittal of May 23, 2001, and Exelon's response to the NRC staff's request for additional information, received by letter dated September 14, 2001. The NRC staff has concluded that the licensee's proposal is acceptable. Accordingly, Exelon's proposed changes to the Dresden Unit 2 and Unit 3 reactor pressure vessel surveillance capsule withdrawal schedules are approved. The attached safety evaluation provides the details of the NRC staff's conclusions.

Sincerely,

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

Enclosure: Safety Evaluation

cc w/encl: See next page

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O. Kingsley
Exelon Generation Company, LLC

Dresden Nuclear Power Station
Units 2 and 3

cc:

Exelon Generation Company, LLC
Site Vice President - Dresden
6500 N. Dresden Road
Morris, Illinois 60450-9765

Mr. John Skolds
Chief Operating Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Exelon Generation Company, LLC
Station Manager - Dresden
6500 N. Dresden Road
Morris, Illinois 60450-9765

Mr. John Cotton
Senior Vice President, Operations Support
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Exelon Generation Company, LLC
Regulatory Assurance Manager - Dresden
6500 N. Dresden Road
Morris, Illinois 60450-9765

Mr. William Bohlke
Senior Vice President, Nuclear Services
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

U.S. Nuclear Regulatory Commission
Dresden Resident Inspectors Office
6500 N. Dresden Road
Morris, Illinois 60450-9766

Mr. Robert J. Hovey
Vice President
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Chairman
Grundy County Board
Administration Building
1320 Union Street
Morris, Illinois 60450

Mr. Christopher Crane
Senior Vice President
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Regional Administrator
U.S. NRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Mr. Jeffrey Benjamin
Vice President - Licensing and Regulatory
Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Illinois Department of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Document Control Desk-Licensing
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

O. Kingsley
Exelon Generation Company, LLC

- 2 -

Dresden Nuclear Power Station
Units 2 and 3

Mr. K. A. Ainger
Director - Licensing
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Mr. Robert Helfrich
Senior Counsel, Nuclear
Mid-West Regional Operating Group
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, Illinois 60555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST TO DEFER FACILITY'S REACTOR PRESSURE VESSEL

SURVEILLANCE CAPSULE WITHDRAWAL SCHEDULE

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

EXELON GENERATION COMPANY, LLC

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By letter dated May 23, 2001, Exelon Generation Company, LLC (Exelon, the licensee), submitted a request for NRC staff review and approval of its proposed modification to the Dresden Nuclear Power Station reactor pressure vessel (RPV) surveillance capsule withdrawal schedules. The proposed change would modify the date of withdrawal of the next surveillance capsules from calendar dates that are equivalent to approximately 19 effective full-power years (EFPY) of operation to the ends of the next operating cycles at Dresden Unit 2 (October 2003, 21.6 EFPY) and Unit 3 (October 2004, 20.9 EFPY). Exelon's submittal was made in accordance with the provision of Title 10 of the Code of Federal Regulations, Part 50, Appendix H, 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 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, 10 CFR 50, Appendix H, 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 the terms of 10 CFR 50, Appendix H, 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 E185, to the extent practical for the configuration of the specimens in the capsules.

Enclosure

The edition of ASTM E 185 to which the Dresden Unit 2 and Unit 3 RPV surveillance programs were designed was the 1962 edition (ASTM E 185-62). However, no specific recommendations were given in ASTM E 185-62 regarding withdrawal schedules. In the subsequent edition, ASTM E 185-66, Paragraph 4.6 addresses the withdrawal schedule as follows: “. . . it 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, no specific guidance or significant constraint was incorporated into design of the Dresden Unit 2 and Unit 3 surveillance programs with regard to capsule withdrawal dates.

However, additional NRC staff guidance has been published regarding licensee requests to obtain one cycle capsule withdrawal deferrals to support the Integrated Surveillance Program (ISP) proposed by the Boiling Water Reactor Vessel and Internals Project (BWRVIP). The ISP proposed by the BWRVIP 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 at least a one cycle capsule deferral 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 one cycle capsule deferrals to support the ISP.

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. Principally, this letter requested that licensees examine how their surveillance capsules would be used (or not used) under the proposed ISP, and to confirm that their requests for a one cycle deferral 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 materials property data, to be acquired from the capsule in question, were 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 and final criterion requested that licensees explain why the dosimetry data, to be acquired from the capsule in question, were not necessary to support safe operation of the facility over the period of the deferral.

3.0 LICENSEE'S DETERMINATION

In its May 23, 2001, submittal, Exelon stated that their reason for requesting this deferral of the next Dresden Unit 2 and Unit 3 surveillance capsules was to support their involvement in the ISP. Exelon then addressed, as described below, the three criteria cited in the NRC staff's May 16, 2000, letter.

Regarding the first criterion, Exelon noted that, according to the scope of the ISP discussed in the BWRVIP-78 report, the surveillance capsules for Dresden Unit 2 were not to be included in the ISP. Hence, deferral of the Dresden Unit 2 capsule for one cycle (or potentially indefinitely) would not affect the ISP. The Dresden Unit 3 surveillance capsules were, however, included within the scope of the ISP documented in the BWRVIP-78 report. Dresden Unit 3 is required to remove a capsule in 2005. Thus, the licensee concluded that deferral of the Dresden Unit 3 capsule would be consistent with the intent of the BWRVIP's proposed ISP.

To address the second criterion, Exelon noted that the material test data, from the capsules to be deferred, were not necessary to ensure continued safe operation of the Dresden RPVs for two reasons. First, the current Dresden Unit 2 and Unit 3 pressure-temperature (P-T) limit curves were noted to have been approved by the staff for operation through 32 effective full power years (EFPY) of operation. These curves are subject to a license condition that requires NRC approval for their use beyond November 30, 2001. (This NRC approval has recently been granted.) However, the licensee contended that no capsule removal would be required to support the P-T Curves. The licensee's second reason was based on the chemical compositions of the surveillance materials and the projected capsule fluences, the surveillance materials were not expected to exhibit sufficient transition temperature shift to have the results be distinguishable from surveillance data scatter. Hence, the data acquired would not be very valuable for either ensuring the integrity of the Dresden RPVs or for adding data to further the general state of knowledge regarding power reactor embrittlement behavior.

Finally, regarding the third criterion, Exelon concluded that the dosimetry information from the capsules to be deferred was not necessary to ensure continued safe operation of the Dresden RPVs. The licensee noted that the operating times for the Dresden RPVs at the end of the proposed deferral period will be 21.6 EFPY for Unit 2 and 20.9 EFPY for Unit 3. Since the current Dresden P-T limits were approved through 32 EFPY, fluence projections would not be exceeded during the deferral period.

For these reasons, Exelon concluded that their request to defer withdrawal of the next Dresden Unit 2 and Unit 3 surveillance capsules was justified and consistent with their intent to support the BWRVIP ISP.

4.0 STAFF EVALUATION

The NRC staff reviewed the information supplied by the licensee, References 1 and 4, and the regulatory requirements and guidance stated in Section 2.0 above. Regarding the requirements of ASTM E185-62, the staff concluded that the licensee's requested modifications to their surveillance capsule withdrawal schedules would be acceptable. The NRC 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 NRC staff concludes that deferral of the next Dresden Unit 2 and Unit 3 capsules are acceptable within the BWRVIP ISP plan. Based on the NRC staff's discussions with the BWRVIP, some modifications to the withdrawal schedule proposed as part of the ISP are expected. In addition, the ISP is intended to improve the quality of data acquired to assess the embrittlement of BWR RPVs. Recalling that the licensee concluded that, if the capsules were not deferred, the Charpy shifts obtained from the surveillance materials would not be distinguishable from data scatter. The staff would expect that a deferral of these capsules would, in fact, be necessary to support the ISP.

Since the licensee's rationale to address the second and third criteria depends on an evaluation of the Dresden Unit 2 and Unit 3 P-T limits, some discussion of the most recently approved Dresden P-T limits is provided here. By letter dated September 19, 2000, the NRC approved new P-T limit curves for Dresden Unit 2 and Unit 3, Reference 2. These P-T limit curves were submitted by the licensee with the intent that they be approved for up to 32 EFPY of operation. However, the NRC staff identified significant issues with the fluence analysis performed to support use of these curves out to 32 EFPY. The NRC staff's main concern was that the

licensee's fluence evaluation utilized an older, potentially non-conservative methodology which does not reflect state-of-the-art improvements in fluence calculations. As a result of these NRC staff's concerns, Exelon agreed to a license condition specifying that the P-T limit curves could only be used for Dresden Unit 2 until November 30, 2001, and only until October 30, 2002, for Dresden Unit 3, unless approval to extend their use is obtained from the NRC. The NRC staff recently approved the use of these curves until December 31, 2003 (Amendment 187), and November 30, 2004 (Amendment 182), respectively, Reference 3. However, acceptance of an updated fluence methodology would not be contingent upon the current capsule removal schedule. NRC staff agrees with the licensee's position that the withdrawal schedule is not a factor in the additional stipulations placed on Dresden Units 2 and 3.

NRC staff analysis of fluence differential between the original and updated removal schedules, from Exelon Nuclear's best estimate, Reference 4, indicated that additional materials test data from the capsules would not lead to significant modification of the Dresden P-T limit curves, since the data obtained would likely not be differentiable from data scatter. The additional dosimetry data would also only be of significance when an updated fluence methodology is employed by the licensee to address NRC staff concerns regarding their current fluence methodology. Therefore, in this case, no additional material test (i.e., Charpy impact test) data or dosimetry data is required to ensure the integrity of the Dresden RPVs through the period of the deferral; nor would it be expected to contribute to the evaluation.

5.0 CONCLUSION

The NRC staff has concluded that deferral of the withdrawal of the next Dresden Unit 2 and Unit 3 surveillance capsules for one cycle is acceptable. These approved changes modify the dates of withdrawal of the next surveillance capsules until October 2003, for Dresden Unit 2, and October 2004, for Dresden Unit 3.

6.0 REFERENCES

1. P. Swafford (Exelon) to U.S. Nuclear Regulatory Commission Document Control Desk, "Revision to Reactor Vessel Material Specimen Removal Schedule," May 23, 2001.
2. L.W. Rossbach (USNRC) to O.D. Kingsley [ComEd], "Dresden - Issuance of Amendments - Revised Pressure-Temperature Limits (TAC NOS. MA8346 and MA8347)," September 19, 2000.
3. R. M. Krich (Exelon) to U.S. Nuclear Regulatory Commission Document Control Desk, "Request for License Amendment for Pressure-Temperature Limits," June 26th, 2001.
4. P. Swafford (Exelon) to U.S. Nuclear Regulatory Commission Document Control Desk, "Revision to Reactor Vessel Material Specimen Removal Schedule, Response to Request for Additional Information," September 14, 2001.

Principal Contributor: J. Collins

Date: October 22, 2001