October 13, 2004

Mr. Christopher M. Crane, President
and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: ISSUANCE OF AMENDMENTS - DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, ONE-TIME EXTENSION OF CONTAINMENT TYPE A LEAK TEST INTERVAL (TAC NOS. MC1796 AND MC1797)

Dear Mr. Crane:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 210 to Facility Operating License No. DPR-19 and Amendment No. 202 to Facility Operating License No. DPR-25 for Dresden Nuclear Power Station (DNPS), Units 2 and 3. The amendments are in response to your application dated January 15, 2004, as supplemented by a letter dated June 22, 2004.

The amendments allow for a one-time deferral of the DNPS, Units 2 and 3 Appendix J, Type A, Integrated Leakage Rate Test (ILRT). The DNPS, Units 2 and 3 ILRT may be deferred to no later than February 27, 2011, and July 13, 2009, respectively, resulting in an extended interval of up to15 years for performance of these tests at each unit.

A copy of the Safety Evaluation is enclosed. The Notice of Issuance will be included in the NRC's biweekly *Federal Register* notice.

Sincerely,

/RA/

Maitri Banerjee, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

Enclosures: 1. Amendment No. 210 to DPR-19
2. Amendment No. 202 to DPR-25
3. Safety Evaluation

cc w/encls: See next page

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MRubin	MRing, RIII		

ADAMS Accession Number: ML042520436 (Package)
ADAMS Accession Number: ML042520432 (Amendment)
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EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-237

DRESDEN NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 210
License No. DPR-19

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Exelon Generation Company, LLC (the licensee) dated January 15, 2004, and as supplemented on June 22, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications (TSs) as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-19 is hereby amended to read as follows:

(2) Technical Specifications

The TSs contained in Appendix A, as revised through Amendment No. 210, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the TSs.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Gene Y. Suh, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: October 13, 2004

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-249

DRESDEN NUCLEAR POWER STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 202
License No. DPR-25

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Exelon Generation Company, LLC (the licensee) dated January 15, 2004, and as supplemented on June 22, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications (TSs) as indicated in the attachment to this license amendment and paragraph 3.B. of Facility Operating License No. DPR-25 is hereby amended to read as follows:

B. Technical Specifications

The TSs contained in Appendix A, as revised through Amendment No. 202, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the TSs.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Gene Y. Suh, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: October 13, 2004

ATTACHMENT TO LICENSE AMENDMENT NOS. 210 AND 202

FACILITY OPERATING LICENSE NOS. DPR-19 AND DPR-25

DOCKET NOS. 50-237 AND 50-249

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

Remove Pages	Insert Pages
5.5-11	5.5-11
5.5-12	5.5-12

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 210 TO FACILITY OPERATING LICENSE NO. DPR-19

AND AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. DPR-25

EXELON GENERATION COMPANY, LLC

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By application dated January 15, 2004, as supplemented by a letter dated June 22, 2004, Exelon Generation Company, LLC (the licensee, EGC) requested changes to the Technical Specifications (TS) for Dresden Nuclear Power Station (DNPS), Units 2 and 3. The supplement dated June 22, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 16, 2004 (69 FR 12367).

The proposed changes would allow a one time deferral of the DNPS, Units 2 and 3 Appendix J, Type A, Integrated Leakage Rate Test (ILRT), which would result in an extended interval of up to 15 years for performance of these tests at each unit. As a result, the Type A containment ILRT test required by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix J would be performed no later than February 28, 2011 (currently scheduled for February 2006), for Unit 2, and no later than July 13, 2009 (currently scheduled for July 2004), for Unit 3. Specifically, the proposed changes would revise the technical specification Section 5.5.12, "Primary Containment Leakage Rate Testing Program," by adding the following statement:

> "..., as modified by the following exception:
>
> 1. NEI 94-01 - 1995, Section 9.2.3: The first Unit 2 Type A test performed after the February 28, 1996, Type A test shall be performed no later than February 27, 2011.
>
> 2. NEI 94-01 - 1995, Section 9.2.3: The first Unit 3 Type A test performed after the July 14, 1994, Type A test shall be performed no later than July 13, 2009."

According to the licensee, the Type A test imposes significant expense on Exelon while the safety benefit of performing the Type A test within 10 years, versus 15 years, is minimal. EGC argues that approval of the proposed changes will result in significant cost savings.

ENCLOSURE

This evaluation addresses the aging degradation of the containment pressure boundary as it relates to the proposed amendment of extending the time interval for performing the containment ILRT from the current 10-year to a 15-year interval.

2.0 BACKGROUND

DNPS Units 2 and 3 are General Electric BWR/3 plants with Mark I primary containment. The Mark I primary containment consists of a drywell, which encloses the reactor vessel, reactor coolant recirculation system and branch lines of the reactor coolant system, a toroidal-shaped pressure suppression chamber containing a large volume of water, and a vent system connecting the drywell to the water space of the suppression chamber. The primary containment is penetrated by access piping, and electrical penetrations.

A Type A test is an overall ILRT of the containment structure. As stated in the request, DNPS Unit 2 has performed five ILRTs (not including the pre-operation test) during the period of its operating license, and completion dates of these tests were: March 1985; December 1986; December 1990; May 1993; and February 1996. DNPS Unit 3 has performed four ILRTs (not including the pre-operation test) during the period of its operating license, and completion dates of these tests were: March 1988; February 1990; March 1992; and July 1994. Based on the successful test results and the requirements of 10 CFR Part 50, Appendix J, Option B, the current interval requirement is 10 years for both Units 2 and 3.

3.0 REGULATORY EVALUATION

The staff finds that the licensee in Section 4.0 of its submittal identified the applicable regulatory requirements to be 10 CFR 50.36, “Technical Specifications,” for the content of the plant TS, and 10 CFR 50 Appendix J, Section V.B, “Implementation,” to specify other regulatory guide or implementing documents to be included by general reference in the TS. Additionally, in Section 6.0 of its submittal, the licensee provided an analysis against these requirements. The regulatory requirements for which the staff based its acceptance are found in 10 CFR Part 50, Appendix J.

The regulations in 10 CFR Part 50, Appendix J were revised, effective October 26, 1995, to allow licensees to perform containment leakage testing in accordance with the requirements of Option A, “Prescriptive Requirements,” or Option B, “Performance-Based Requirements.” Appendix J, Option B requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. Amendments 148 and 142 (Reference 2) were issued on January 11, 1996 to permit the implementation of Appendix J, Option B for DNPS, Units 2 and 3, respectively. DNPS, Units 2 and 3, TS 5.5.12, “Primary Containment Leakage Rate Testing Program,” requires that leakage rate testing be performed as required by 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide (RG) 1.163, “Performance-Based Containment Leak-Test Program,” dated September 1995. This RG endorses, with certain exceptions, Nuclear Energy Institute (NEI) report NEI 94-01, Revision 0,

"Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 26, 1995, and ANSI/ANS 56.8-1994, subject to several regulatory positions.

NEI 94-01 specifies an initial ILRT test interval of 48 months, but allows an extended interval of 10 years, based upon two consecutive successful tests. There is also a provision for extending the test interval an additional 15 months in certain circumstances. The most recent two Type A tests at each of the Dresden units have been successful, so the current interval requirement is 10 years.

The current DNPS 10-year interval for Type A testing ends on February 27, 2006 for Unit 2, and July 13, 2004 for Unit 3. The licensee is requesting a change to TS 5.5.12 which would add two exceptions from the guidelines of RG 1.163 and NEI 94-01, Revision 0, regarding the Type A test interval. Specifically, the first exception states that the first Unit 2 Type A test performed after the February 28, 1996, Type A test shall be performed no later than February 27, 2011. The second exception states that the first Unit 3 Type A test performed after the July 14, 1994, Type A test shall be performed no later than July 13, 2009.

The local leakage rate tests (LLRTs) (Type B and Type C tests), including their schedules, are not affected by this request. As described in Reference 1, the extended testing interval will not affect any American Society of Mechanical Engineers (ASME) Code requirements or ASME Code acceptance criteria.

4.0 TECHNICAL EVALUATION

The staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment which are described in Sections 5.0 through 5.9 of the licensee's submittal. The detailed evaluation below supports the conclusion that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

4.1 Mechanical and Structural Integrity Evaluation

With the requested extension of the ILRT time interval, the licensee proposed that the next overall verification of the containment leak-tight integrity will be performed by February 28, 2011 for Unit 2 and July 13, 2009 for Unit 3. Because the leak rate testing requirements (ILRT and LLRTs) of Option B of 10 CFR Part 50, Appendix J, and the containment inservice inspection (ISI) requirements mandated by 10 CFR 50.55a complement each other in ensuring the leak-tightness and structural integrity of the containment, the staff, from its review of Type A test interval extension application of other plants, has identified the following five general areas that the licensee was requested to address in relation to the ISI of the containment:

A. Since the submittal did not include sufficient description or summary of the containment ISI program being implemented at the plant, provide a description of the ISI methods that provide assurance that, in the absence of a containment ILRT for 15 to 20 years, the containment structural and leak-tight integrity will be maintained.

B. Subsection IWE-1240 requires licensees to identify the containment surface areas requiring augmented examinations. Provide the locations of the steel containment (or concrete containment liner) surfaces that have been identified as requiring augmented examination and a summary of the findings of the examinations performed.

C. For the examination of penetration seals and gaskets, and examination and testing of bolted connections associated with the primary containment pressure boundary (Examination Categories E-D and E-G), the licensee requested relief from the requirements of the code. As an alternative, the licensee proposed to examine the above items during the leak-rate testing of the primary containment. Option B of Appendix J for Type B and Type C testing (as per NEI 94-01 and RG 1.163), and the ILRT extension requested in this amendment for Type A testing provide flexibility in the scheduling of these inspections. Discuss your schedule for examination and testing of seals, gaskets, and bolted connections that provide assurance regarding the integrity of the containment pressure boundary.

D. In some cases, the stainless steel bellows were found to be susceptible to trans-granular stress corrosion cracking, and the leakage through these bellows is not readily detectable by the Type B testing (see Information Notice 92-20). If applicable, provide information regarding your plans for inspection and testing of the bellows, and how their performance has been factored into the risk assessment of containment leakage to support the proposed Technical Specification change.

E. Inspections of some reinforced concrete and steel containment structures have identified degradation on an embedded side of the drywell steel shell and steel liner of the primary containment that can not be inspected. These degradations cannot be found by visual (i.e., VT-1 of VT-3) examinations unless they are through the thickness of the shell or liner, or when 100 percent of the uninspectable surfaces are periodically examined by ultrasonic testing. Discuss how potential leakage under high pressure during core damage accidents is factored into the risk assessment related to the extension of the ILRT.

The staff's evaluation of the licensee's responses to the above areas (References 1 and 3) is discussed below.

A. In response to the first item, the licensee stated, in Reference 3, that DNPS Units 2 and 3 have implemented a containment inservice inspection (CISI) program in accordance with the requirements of ASME Section XI, "Inservice Inspection," Subsection IWE, "Requirements for Class MC Components of light-Water Cooled Power Plant." According to the licensee, the DNPS CISI plan was developed in accordance with the requirements of the 1998 Edition of the ASME Code, Section XI, Division 1, Subsection IWE. The use of the 1998 Edition of the ASME Code for the DNPS CISI program as an alternative to the 1992 Edition and 1992 Addenda of the ASME Code was authorized by

the staff in a letter dated September 18, 2000 (Reference 4). The components subject to Subsection IWE requirements are those that make up the containment structure and its leak-tight barrier (including integral attachments), and those that contribute to its structural integrity. Specifically included are Class MC pressure retaining components, such as the drywell, torus, pressure retaining bolting, etc. The licensee also stated that there will be no change to the schedule for the ISI as a result of the extended ILRT interval. Based on its review of the information provided by the licensee, the staff finds that the schedule for implementing the containment ISI program will not be affected by the requested extension of the ILRT interval (up to 15 years).

B. For the second item related to the application of an augmented examination (required by IWE Table-2500-1, Examination Category E-C), the licensee stated, in Reference 3, that EGC initially classified the regions of the DNPS drywell liner adjacent to the sand pocket region as augmented. Core drilling through the concrete floor had been performed on DNPS Unit 3 in 1988 to monitor drywell corrosion in this region in response to Generic Letter 87-05. Since the sand pocket region experienced repeated wetting during refueling outages, the area was initially examined in accordance with IWE Table 2500-1, Examination Category E-C. Ultrasonic testing thickness readings taken in 1988, 1997, 1999, 2000 and 2002 demonstrate that any degradation in this region will not impact the structural integrity of the primary containment over the current operating license term. Therefore, in accordance with IWE-2420(c), further augmented examinations would no longer be required. Furthermore, EGC has committed to continue monitoring this region as an augmented examination area to confirm corrosion rate remain acceptable such that an adequate wall thickness will remain to the end of the license operating period. On the basis of the discussion above, the staff finds the licensee's response reasonable and acceptable.

C. With regard to the item related to the ISI of seals, gaskets and the pressure retaining bolting, the licensee indicated, in Reference 3, that for the pressure-retaining bolted connections, the DNPS CISI program implements Subsection IWE of the 1998 Edition, ASME Code, Section XI in accordance with DNPS Relief Request MCR-02 in which the licensee requested an approval from the staff to use the 1998 Edition of the ASME Code for the DNPS CISI program, as an alternative to the 1992 Edition and 1992 Addenda of the ASME Code. According to the 1998 Edition of the ASME Code, Examination Categories E-D and E-G of IWE Table 2500-1 were eliminated. With regard to the Relief request MCR-02, the staff stated, in its safety evaluation (Reference 7), that the licensee's proposed alternative provides an acceptable level of quality and safety in this area. The licensee also stated that based on relief request MCR-02, Appendix J leak rate testing is performed, in lieu of the examination of seals and gaskets, and examination and testing of bolted connections. In addition, a VT-3 examination of bolted connections, with bolting in place, is performed each inspection period in conjunction with the inspection of containment surfaces. On the basis of the above discussion, the staff finds that the licensee's ISI program for seals, gaskets and bolted connections provides reasonable assurance that the integrity of the containment pressure boundary will be maintained.

D. To address the fourth item, the licensee, in 1991, requested an exemption from local leak rate testing (Type B) requirements of Appendix J for the two-ply containment penetration expansion bellows at DNPS, because the bellows are designed such that they cannot be properly tested to satisfy Type B testing requirements. In the application (Reference 1), the licensee stated that the exemption specifies an alternative program of bellows testing and replacement that involves testing with air at a reduced leakage limit, testing any leaking bellows with helium (i.e., sniffer testing), replacing bellows that are unacceptable, and performing a Type A test each refueling outage until all of the bellows have been replaced with testable bellows. This testing program is intended to assure that at least one ply of a two-ply bellows is intact and that overall containment leakage is within its allowable limit as shown by Type A testing. In a letter dated February 6, 1992 (Reference 5), the staff stated that the Type A test is essential to the program because it is the only test available that can properly quantify the bellows' leakages, albeit not individually. This is especially important for those bellows which are known to leak but will not be replaced until after another cycle. In Reference 5, the staff also stated that the proposed testing program will detect bellows assemblies with significant flaws and result in replacement of flawed assemblies within one operating cycle, during which period there is reasonable assurance that the bellows assemblies will not suffer excessive degradation. On this basis, the staff granted the exemption.

In October 1994 (Reference 6), the licensee requested a revision to the exemption granted in Reference 5. The revised exemption would delete the requirement to perform a Type A test each refueling outage based on alternative Type B tests developed, since the original exemption was issued, to determine the leakage from the two-ply containment penetration expansion bellows. These alternative tests can be applied to ensure the intent of requiring a Type A test, as part of the original exemption, is met. As stated in Reference 6, the requirement to perform a Type A test every outage is not necessary to ensure that the bellows assemblies are adequately tested and leakage from any leaking bellows assembly is adequately quantified. This licensee's position was developed based upon the following insights gained during testing of two-ply bellows:

- there is minimal probability for the occurrence of a large leak in two-ply bellows;
- the special testing program is effective for identifying small leaks in two-ply bellows;
- the Type A test is ineffective for identifying small leaks in two-ply bellows; and
- more cost effective alternative methods have been developed for quantifying leakage.

For two-ply bellows that leak through both plies, the revised exemption allows: (1) a valid Type B test using one of the alternative tests to ensure compliance to license limits, or (2) a Type A test as required in the original exemption and, before the return to power in a subsequent refueling outage, replacement of the bellows with a testable bellows assembly or performance of a valid Type B test to ensure that the license limits are met.

This revised exemption was granted by the staff, in a letter dated February 9, 1995 (Reference 7) based on its finding that the underlying purpose of the regulation will be met. The staff's approval of the exemption was based on the fact that the proposed testing program will detect bellows assemblies with significant flaws and result in replacement of flawed assemblies within one operating cycle, or the performance of Type B test to ensure that the license limits are met, during which period there is reasonable assurance that the bellows assemblies will not suffer excessive degradation.

In Reference 6, the licensee also stated that the proposed change to extend the Type A test frequency from once in 10 years to once in 15 years does not affect the conclusions for granting the exemption. The testing program approved by the staff will continue to detect bellows assemblies with significant flaws and result in replacement of flawed assemblies within one operating cycle, or the performance of Type B test to ensure that the license limits are met, during which period there is reasonable assurance that the bellows assemblies will not suffer excessive degradation.

On the basis of the above discussion, the staff concludes that this item is adequately addressed.

E. In regard to the item related to the inaccessible areas of the containment liner for which degradations cannot be detected by visual examinations, the licensee, as discussed in References 1 and 3, performed an ILRT extension risk assessment considering the potential age related corrosion effects on the containment liner integrity and a series of parametric sensitivity studies. The results of the risk assessment indicated that the ILRT interval extension has a minimal impact on plant risk. From its review of the licensee's submittal, the staff finds that the increase in predicted risk due to the proposed change is within the acceptance guidelines while maintaining the defense-in-depth philosophy of RG 1.174, "An Approach For Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and is, therefore, acceptable. The details of the staff's evaluation regarding the risk assessment performed by the licensee is described in Section 4.2 of this safety evaluation.

On the basis of its review of the information provided by the licensee in the TS amendment request and the licensee's response to the staff's questions, the staff finds that: (1) the structural integrity of the containment vessel is verified through the periodic inservice inspections conducted as required by Subsection IWE of the ASME Code, Section XI, and (2)

the integrity of the penetrations and containment isolation valves are periodically verified through Type B and Type C tests as required by 10 CFR Part 50, Appendix J. In addition, the system pressure tests for containment pressure boundary (i.e., Appendix J tests, as applicable) are required to be performed following repair and replacement activities, if any, in accordance with Article IWE-5000 of the ASME Code, Section XI.

4.2 Probabilistic Risk Assessment Evaluation

The licensee has performed a risk impact assessment of extending the Type A test interval to 15 years. The risk assessment was provided in the January 15, 2004, application for license amendment. Additional analysis and information was provided by the licensee in its letter dated June 22, 2004. In performing the risk assessment, the licensee considered the guidelines of NEI 94-01, the methodology used in Electric Power Research Institute (EPRI) TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing," and RG 1.174.

The basis for the current 10-year test interval is provided in Section 11.0 of NEI 94-01, Revision 0, and was established in 1995 during the development of the performance-based Option B to Appendix J. Section 11.0 of NEI 94-01 states that NUREG-1493, "Performance-Based Containment Leak-Test Program," provided the technical basis to revise leakage rate testing requirements contained in Option B to Appendix J. The basis consisted of qualitative and quantitative assessments of the risk impact (in terms of increased public dose) associated with a range of extended leakage rate test intervals. To supplement this basis, industry undertook a similar study. The results of that study are documented in EPRI Research Project Report TR-104285.

The EPRI study used an analytical approach similar to that presented in NUREG-1493 for evaluating the incremental risk associated with increasing the interval for Type A tests. The Appendix J, Option A, requirements that were in effect for DNPS, Units 2 and 3, early in the plant's life required a Type A test frequency of three tests in 10 years. The EPRI study estimated that relaxing the test frequency from three tests in 10 years to one test in 10 years would increase the average time that a leak that was detectable only by a Type A test goes undetected from 18 to 60 months. Since Type A tests only detect about 3 percent of the leaks (the rest are identified during local leak rate tests based on industry leakage rate data gathered from 1987 to 1993), this results in a 10 percent increase in the overall probability of leakage. The risk contribution of pre-existing leakage for the pressurized water reactor and boiling water reactor representative plants in the EPRI study confirmed the NUREG-1493 conclusion that a reduction in the frequency of Type A tests from three tests in 10 years to one test in 20 years leads to an "imperceptible" increase in risk that is on the order of 0.2 percent and a fraction of one person-rem per year in increased public dose.

Building upon the methodology of the EPRI study, the licensee assessed the change in the predicted person-rem per year frequency. The licensee quantified the risk from sequences that have the potential to result in large releases if a pre-existing leak were present. Since completing the Option B rulemaking in 1995, the staff has issued RG 1.174 on the use of

probabilistic risk assessment (PRA) in evaluating risk-informed changes to a plant's licensing basis. The licensee has proposed using RG 1.174 guidance to assess the acceptability of extending the Type A test interval beyond that established during the Option B rulemaking.

RG 1.174 defines very small changes in the risk-acceptance guidelines as increases in core damage frequency (CDF) less than 10^{-6} per year and increases in large early release frequency (LERF) less than 10^{-7} per year. Since the Type A test does not impact CDF, the relevant criterion is the change in LERF. The licensee has estimated the change in LERF for the proposed change and the cumulative change from the original frequency of three tests in a 10-year interval. RG 1.174 also discusses defense-in-depth and encourages the use of risk analysis techniques to help ensure and show that key principles, such as the defense-in-depth philosophy, are met. The licensee estimated the change in the conditional containment failure probability for the proposed change to demonstrate that the defense-in-depth philosophy is met.

The licensee provided analyses, as discussed below. The following comparisons of risk from a change in test frequency from three tests in 10 years to one test in 15 years are considered to be bounding for DNPS, Units 2 and 3, comparative frequencies of one test in 10 years to one test in 15 years. The following conclusions can be drawn from the analysis associated with extending the Type A test frequency:

A. Given the change from a three in 10-year test frequency to a one in 15-year test frequency, the increase in the total integrated plant risk is estimated to be less than 0.01 person-rem per year. This increase is comparable to that estimated in NUREG-1493, where it was concluded that a reduction in the frequency of tests from three in 10 years to one in 20 years leads to an "imperceptible" increase in risk.

   A sensitivity case provided by the licensee indicates that risk would not be substantially impacted if potential leakage through degraded containment bellows was explicitly included in the risk analysis. Leakage through degraded containment bellows was initially identified at Dresden in 1990 following discovery of a testability issue at Quad Cities. Most of the leaking bellows assemblies were replaced with Type-B-testable assemblies in the first outage following issue identification, but approximately two-thirds of the original, non-Type-B-testable assemblies remain in service at Dresden. The licensee estimated the failure probability for the remaining assemblies based on the number of degraded assemblies that have been identified since the initial replacement of degraded bellows. Based on a review of measured leakage rates, a degraded bellows was treated as a small pre-existing leak. This is reasonable since even if all non-Type-B-testable assemblies were to leak at the maximum observed leakage rate from a degraded bellows, the combined leakage rate would be less than that associated with a large pre-existing leak. The increase in plant risk from including bellows degradation is estimated to be about 0.02 person-rem per year based on an allowed Technical Specification leakage of 0.5% per day used in the Type A test risk assessment, and 0.1 person-rem per year based on a leakage of 3.0% per day used in the (pending) Alternate Source Term application for Dresden.

The staff in reviewing the above licensee analysis did not use the increase in plant risk in terms of dose value calculated using the Alternate Source Term (AST) mentioned above, as the licensee's application for use of AST has not yet been approved by the NRC. However, the staff concludes that based on the allowed TS leakage rate used in the Type A test risk assessment, the resulting increase in the total integrated plant risk for the proposed change is small and supportive of the proposed change.

B. The increase in LERF resulting from a change in the Type A test frequency from the original three in 10 years to one in 15 years is estimated to be 1.8×10^{-8} per year based on the internal events PRA. However, there is some likelihood that the flaws in the containment estimated as part of the Class 3b frequency would be detected as part of the Subsection IWE/IWL visual examination of the containment surfaces (as identified in ASME Boiler and Pressure Vessel Code, Section XI, Subsections IWE/IWL). Visual inspections are expected to be effective in detecting large flaws in the visible regions of containment, and this would reduce the impact of the extended test interval on LERF. The licensee's risk analysis considered the potential impact of age-related corrosion/degradation in inaccessible areas of the containment liner on the proposed change. The increase in LERF associated with corrosion events is estimated to be less than 1×10^{-8} per year. Leakage from degraded bellows would not impact the calculated change in LERF as discussed above. The staff concludes that increasing the Type A test interval to 15 years results in only a small change in LERF and is consistent with the acceptance guidelines of RG 1.174.

C. RG 1.174 also encourages the use of risk analysis techniques to help ensure and show that the proposed change is consistent with the defense-in-depth philosophy. Consistency with the defense-in-depth philosophy is maintained if a reasonable balance is preserved between prevention of core damage, prevention of containment failure, and consequence mitigation. The licensee estimates the change in the conditional containment failure probability to be an increase of 1.0 percentage point for the cumulative change of going from a test frequency of three in 10 years to one in 15 years. The staff finds that the defense-in-depth philosophy is maintained based on the small magnitude of the change in the conditional containment failure probability for the proposed amendment.

Based on these conclusions, the staff finds that the increase in predicted risk due to the proposed change is within the acceptance guidelines of RG 1.174, while maintaining the defense-in-depth philosophy, and, therefore, is acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Illinois official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (69 FR 12367). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCES

1. Letter from Patrick R. Simpson, Exelon Generation to NRC, “Request for Amendment to Technical Specification 5.5.12, ‘Primary Containment Leakage rate Testing Program,’ - Dresden Nuclear Power Station, Units 2 and 3,” dated January 15, 2004.

2. Letter from John F. Stang, NRC to D. L. Farrar, Commonwealth Edison Company, “Issuance of Amendments Related to 10 CFR Part 50, Appendix J, Option B,” dated January 11, 1996.

3. Letter from Patrick R. Simpson, Exelon Generation to NRC, “Response to Request for Additional Information Related to Request for Amendment to Technical Specification 5.5.12 - Primary Containment Leakage Rate Testing Program,” dated June 22, 2004.

4. Letter from A. J. Mendiola, NRC to O. D. Kingsley, Commonwealth Edison Company, "Byron, Dresden and LaSalle - Evaluation of Relief Request: Use of 1998 Edition of Subsections IWE and IWL of the ASME Code for Containment Inspection," dated September 18, 2000.

5. Letter from B. A. Boger, NRC to T. J. Kovach, Commonwealth Edison, "Exemption from the Testing Requirements of Appendix J to 10 CFR Part 50 for Dresden and Quad Cities Nuclear Power Stations," dated February 6, 1992.

6. Letter from L. L. Schrage, Commonwealth Edison to W. T. Russell, NRC, "Request to revise Exemption from 10 CFR Part 50, Appendix J, Type B Testing Requirement for Two-Ply Containment Penetration Bellows," dated October 4, 1994.

7. Letter from R. M. Pulsifer, NRC to D. L. Farrar, Commonwealth Edison, "Revision to Exemption from Appendix J to 10 CFR Part 50 for Quad Cities, Units 1 and 2, and Dresden, Units 2 and 3," dated February 9, 1995.

8. Letter from A. J. Mendiola, NRC to O. D. Kingsley, Commonwealth Edison, "Byron, Dresden and LaSalle - Evaluation of relief Requests: Use of 1998 Edition of Subsections IWE and IWL of the ASME Code for Containment Inspection," dated September 18, 2000.

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