

October 4, 2002

Mr. John L. Skolds, President  
Exelon Nuclear  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 - RELIEF REQUEST  
PR-22 FOR THIRD 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NOS.  
MB4030 AND MB4031)

Dear Mr. Skolds:

By letter dated February 14, 2002, Exelon Generation Company, LLC (Exelon) submitted a request for relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, for Dresden Nuclear Power Station, Units 2 and 3. The relief request, PR-22, concerns alternative corrective measures if leakage occurs at bolted connections during system pressure tests.

The Nuclear Regulatory Commission staff has reviewed and evaluated the information provided by Exelon concerning relief request PR-22. This relief is authorized in accordance with 10 CFR 50.55a(a)(3)(i) for the duration of the third 10-year inservice inspection interval because the proposed alternative will provide an acceptable level of quality and safety.

The enclosed safety evaluation contains the basis for this determination. This completes the staff's activities under TAC Nos. MB4030 and MB4031. If you have any questions about this review, please contact Lawrence Rossbach at (301) 415-2863.

Sincerely,

***/RA by L. Raghavn for/***

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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**OFFICIAL RECORD COPY**

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THIRD YEAR 10-INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NO. PR-22

EXELON GENERATION COMPANY, LLC

DRESDEN POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By letter dated February 14, 2002, Exelon Generation Company, LLC (the licensee) submitted a request for relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, for Dresden Nuclear Power Station (DNPS), Units 2 and 3. The relief request, PR-22, concerns alternative corrective measures if leakage occurs at bolted connections during system pressure tests.

2.0 REGULATORY EVALUATION

Inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the DNPS, Units 2 and 3 third 10-year ISI interval is the 1989 Edition of the ASME Code, Section XI.

### 3.0 TECHNICAL EVALUATION

#### Request for Relief No. PR-22

Code Requirement: ASME Section XI, 1989 Edition, paragraph IWA-5250(a)(2) requires, in part, that "if leakage occurs at a bolted connection on other than a gaseous system, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100."

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee requested relief from removing the bolting and then performing VT-3 examination to detect evidence of corrosion.

#### Component Identification

Code Class:	1, 2, and 3
References:	IWA-5250(a)(2)
Examination Category:	Not Applicable
Item Number:	Not Applicable
Description:	Alternative Rules for Corrective Measures if Leakage Occurs at Bolted Connections

#### Licensee's Basis for Requesting Relief: (As stated)

In accordance with 10 CFR 50.55a, "Code and Standards," paragraph (a)(3)(i), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

Removal of pressure retaining bolting at mechanical connections for VT-3 visual examination and subsequent evaluation in locations where leakage has been identified is not always the most prudent course of action to determine condition of the bolting and/or the root cause of the leak. The requirement to remove, examine, and evaluate bolting in this situation does not allow consideration of other factors which may indicate the condition of mechanical joint bolting. Other factors which should be considered in an evaluation of bolting condition when leakage has been identified at a mechanical joint include, but are not limited to:

- Bolting material
- Corrosiveness of process fluid
- Service age of joint bolting materials
- Leakage location
- Leakage history at connection
- Visual evidence of corrosion at connection (connection assembled)
- Plant/industry studies of similar bolting materials in a similar environment
- Condition and leakage history of adjacent components

An example at DNPS is the complete replacement of bolting materials (e.g., studs, bolts, nuts, washers, etc.) at mechanical joints during plant outages. In some cases, when the associated system process piping is pressurized during plant start-up, leakage is identified at these joints. The cause of this leakage is often due to thermal expansion of the piping and bolting materials at the joint and subsequent process fluid seepage at the joint gasket. In most of these cases, proper re-torquing of the joint bolting stops the leakage. Removal of any of the joint bolting to evaluate for corrosion would be unwarranted in this situation. ASME Code Section XI Interpretation XI-1-92-01 has recognized that this situation exists, and has clarified that the requirements of IWA-5250(a)(2) do not apply.

Licensee's Proposed Alternative Examination: (As stated)

DNPS proposes the following alternative methodology to the requirements of IWA-5250(a)(2), which will provide an equivalent level of quality and safety when evaluating leakage and bolting material condition at Class 1, 2, and 3 bolted connections.

As an alternative to the requirements of IWA-5250(a)(2), one of the following requirements shall be met for leakage at bolted connections.

- (a) The leakage shall be stopped, and the bolting and component material shall be reviewed for joint integrity.
- (b) If the leakage is not stopped, the joint shall be evaluated in accordance with IWB-3142.4, "Acceptance by Analytical Evaluation," for joint integrity. The evaluation will determine the susceptibility of the bolting to corrosion, the potential for failure, and identify appropriate corrective actions. Factors to be considered in the evaluation include bolting materials, service age of joint bolting materials, leakage history at connection, leakage location, visual evidence of corrosion at connection, corrosiveness of process fluid, plant/industry studies of similar bolting materials in a similar environment and condition and leakage history of adjacent components.

If any of the above parameters indicates a need for further examination, the bolt closest to the source of leakage shall be removed, receive a VT-3 examination, and be evaluated in accordance with IWA-3100(a). If the leakage is identified when the bolted connection is in service, and the information in the evaluation is supportive, the removal of the bolt for VT-3 examination may be deferred to the next refueling outage. When the removed bolt has evidence of degradation, all remaining bolting shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100(a).

Staff Evaluation:

In accordance with the ASME Section XI, 1995 Edition with addenda up to and including the 1996 Addenda, paragraph IWA-5250(a)(2) requires that when leakage occurs at a bolted connection on other than a gaseous system, one of the bolts be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected is the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection are removed, VT-3 examined, and evaluated in accordance with IWA-3100.

In lieu of the Code-required removal of bolting to perform a VT-3 visual examination the licensee has proposed an engineering evaluation as noted below:

- (a) The leakage shall be stopped, and the bolting and component material shall be reviewed for joint integrity.
- (b) If the leakage is not stopped, the joint shall be evaluated in accordance with IWB-3142.4, "Acceptance by Analytical Evaluation," for joint integrity. The evaluation will determine the susceptibility of the bolting to corrosion, the potential for failure, and identify appropriate corrective actions. Factors to be considered in the evaluation include bolting materials, service age of joint bolting materials, leakage history at connection, leakage location, visual evidence of corrosion at connection, corrosiveness of process fluid, plant/industry studies of similar bolting materials in a similar environment and condition and leakage history of adjacent components.

The licensee further proposed that, if any of the above parameters indicates a need for further examination, the bolt closest to the source of leakage will be removed, receive a VT-3 examination, and be evaluated in accordance with IWA-3100(a). In addition, if the leakage is identified when the bolted connection is in service, and the information in the evaluation is supportive, the removal of the bolt for VT-3 examination may be deferred to the next refueling outage. In both cases, if the removed bolt has evidence of degradation, all remaining bolting will be removed, VT-3 examined, and evaluated in accordance with IWA-3100(a).

The licensee's proposed alternative allows the licensee to utilize a systematic approach and sound engineering judgement when all of the evaluation factors listed in the licensee's proposed alternative are considered. The staff has determined that the licensee's proposed alternative to use an engineering evaluation in lieu of the requirements of ASME Code, Section XI, IWA-5250(a)(2) in regard to corrective action for leakage identified at bolted connections provides a reasonable acceptable level of quality and safety.

#### 4.0 CONCLUSION

The staff concludes that the licensee's proposed alternative in lieu of the Code-requirement provides a reasonable acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval.

Principal Contributor: T. McLellan, EMCBC

Date: October 4, 2002