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Nuclear

10 CFR 50.90

RS-06-105

July 21, 2006

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Unit 3
Renewed Facility Operating License No. DPR-25
NRC Docket No. 50-249

Subject: Request for Technical Specifications Change for Minimum Critical Power Ratio Safety Limit

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (EGC) requests an amendment to Renewed Facility Operating License No. DPR-25 for Dresden Nuclear Power Station (DNPS), Unit 3. The proposed change revises the values of the safety limit minimum critical power ratio (SLMCPR) in Technical Specification (TS) Section 2.1.1, "Reactor Core SLs." Specifically, the proposed change would require that for Unit 3, the minimum critical power ratio (MCPR) for Global Nuclear Fuel (GNF) fuel shall be $\geq$ 1.10 for two recirculation loop operation, or $\geq$ 1.11 for single recirculation loop operation. Additionally, the proposed change would require that MCPR for Westinghouse fuel shall be $\geq$ 1.12 for two recirculation loop operation, or $\geq$ 1.14 for single recirculation loop operation. This change is needed to support the next cycle of Unit 3 operation.

This request is subdivided as follows.

- Attachment 1 provides an evaluation supporting the proposed change.
- Attachment 2 contains the marked-up TS page, with the proposed change indicated.
- Attachment 3 provides a marked-up copy of the affected TS Bases pages. The TS Bases pages are provided for information only, and do not require NRC approval.
- Attachment 4 provides a description of the SLMCPR evaluation for DNPS Unit 3 Cycle 20, as well as a summary of the Westinghouse establishment of a critical power ratio correlation for GNF GE14 fuel.
- Attachment 5 contains an affidavit and non-proprietary version of Attachment 4.

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The proposed change has been reviewed by the DNPS Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the EGC Quality Assurance Program.

EGC requests approval of the proposed change by November 3, 2006, to support startup following the next refueling outage for Unit 3 (i.e., D3R19), which is scheduled to start in November 2006. Once approved, the amendment will be implemented prior to startup from D3R19. This implementation period will provide adequate time for the affected station documents to be revised using the appropriate change control mechanisms.

In accordance with 10 CFR 50.91(b), EGC is notifying the State of Illinois of this application for changes to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

Attachment 4 contains information proprietary to Westinghouse Electric Company LLC; it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit, provided in Attachment 5, sets forth the basis on which the information may be withheld from public disclosure by the NRC and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Accordingly, it is requested that the information be withheld from public disclosure in accordance with 10 CFR 2.390. A non-proprietary version of the information contained in Attachment 4 is also provided in Attachment 5.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 21st day of July 2006.

Respectfully,

Keith R. Jury
Director – Licensing and Regulatory Affairs

Attachments:

- Attachment 1: Evaluation of Proposed Change
- Attachment 2: Markup of Proposed Technical Specifications Page
- Attachment 3: Markup of Technical Specifications Bases Pages
- Attachment 4: Dresden Unit 3 Cycle 20 SLMCPR (PROPRIETARY)
- Attachment 5: Westinghouse Application for Withholding, Affidavit, and Non-Proprietary Version of Attachment 4

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1
Evaluation of Proposed Change

ATTACHMENT 1
Evaluation of Proposed Change

1.0 DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (EGC) requests an amendment to Renewed Facility Operating License No. DPR-25 for Dresden Nuclear Power Station (DNPS), Unit 3. The proposed change revises the values of the safety limit minimum critical power ratio (SLMCPR) in Technical Specification (TS) Section 2.1.1, "Reactor Core SLs." Specifically, the proposed change would require that for Unit 3, the minimum critical power ratio (MCPR) for Global Nuclear Fuel (GNF) fuel shall be $\geq$ 1.10 for two recirculation loop operation, or $\geq$ 1.11 for single recirculation loop operation. Additionally, the proposed change would require that MCPR for Westinghouse fuel shall be $\geq$ 1.12 for two recirculation loop operation, or $\geq$ 1.14 for single recirculation loop operation. This change is needed to support the next cycle of Unit 3 operation. The proposed change is described below.

2.0 PROPOSED CHANGE

TS Section 2.1.1.2 specifies the value for the SLMCPR. For DNPS, Unit 3, the current values specified are as follows.

> For Unit 3 two recirculation loop operation, MCPR shall be $\geq$ 1.10, or for single recirculation loop operation, MCPR shall be $\geq$ 1.11.

The proposed change will revise TS Section 2.1.1.2 for Unit 3 to read as follows.

> For Unit 3, MCPR for GNF fuel shall be $\geq$ 1.10 for two recirculation loop operation, or $\geq$ 1.11 for single recirculation loop operation. MCPR for Westinghouse fuel shall be $\geq$ 1.12 for two recirculation loop operation, or $\geq$ 1.14 for single recirculation loop operation.

Attachment 2 provides the marked-up TS page indicating the proposed change. Attachment 3 provides the marked-up TS Bases pages for informational purposes.

3.0 BACKGROUND

The fuel cladding integrity SLMCPR is established to assure that at least 99.9% of the fuel rods in the core do not experience boiling transition during an anticipated operational occurrence (AOO). To determine the explicit value for the cycle specific safety limit, a full core statistical analysis is performed. The core model incorporates the uncertainty in the measurement of core operating parameters, critical power ratio (CPR) calculation uncertainties, and the statistical uncertainty associated with the fuel vendor's correlation. The number of rods that might experience boiling transition as a function of the nominal MCPR is calculated.

The GNF NRC-approved methodology (i.e., References 1 and 2) was used previously to determine the appropriate SLMCPR values for the current DNPS Unit 3 fuel cycle (i.e., Cycle 19). The Cycle 19 core is a mixed core containing both GNF GE14 fuel and Framatome-ANP (FANP) ATRIUM-9B fuel assemblies. Consistent with the GNF methodology, the resulting SLMCPR values for Cycle 19 apply to all fuel types in the core, such that the same SLMCPR values are applied to both the GE14 and ATRIUM-9B fuel.

EGC will load Westinghouse SVEA-96 Optima2 fuel assemblies in DNPS Unit 3 for Cycle 20. Therefore, the Westinghouse NRC-approved methodology (i.e., Reference 3) was used to determine the SLMCPR values for Cycle 20. Unlike the GNF methodology, the Westinghouse methodology generates a unique SLMCPR value for each fuel product line present in the core. Since Cycle 20 will be a mixed core containing both GE14 and SVEA-96 Optima2 fuel assemblies, the proposed change specifies unique SLMCPR values for the two fuel types. There will be no ATRIUM-9B fuel assemblies in the core for Cycle 20. EGC will continue to use NRC-approved methodologies, as required by TS Section 5.6.5, "Core Operating Limits Report (COLR)," for future reload cycle designs.

4.0 TECHNICAL ANALYSIS

In Reference 4, the NRC issued a license amendment for DNPS that, in part, revised TS Section 5.6.5 to allow Westinghouse methodologies, which have been generically approved by the NRC, to be used for core reload evaluations. The methodology used for SLMCPR evaluations is described in Reference 3, which was approved for use at DNPS as part of the Reference 4 amendment.

Attachment 4 provides technical information to support the proposed change. A description of the SLMCPR evaluation for DNPS Unit 3 Cycle 20, as well as a summary of the Westinghouse establishment of a CPR correlation for GNF GE14 fuel, is provided in Attachment 4. In addition the following information is provided to support the proposed change, since this information was requested in support of a previously approved amendment for Quad Cities Nuclear Power Station (QCNPS), Unit 2 (i.e., Reference 5).

Unit 3 Cycle 20 Core Loading Pattern

The DNPS Unit 3 Cycle 20 core loading pattern was developed via a design collaboration between EGC and Westinghouse. Both Westinghouse and EGC used NRC-approved lattice physics codes and three-dimensional simulator codes to perform bundle and core design calculations, respectively. The Westinghouse core reload design group performed design calculations using the PHOENIX lattice physics code and the POLCA7 three-dimensional simulator code, while the EGC Nuclear Fuels (NF) core reload design group used the CASM04 lattice physics code and MICROBURN-B2 three-dimensional simulator code.

The core loading pattern was developed, reviewed, and approved in accordance with the EGC core reload design process and procedures. Consistent with this, NF worked with DNPS to develop and document the design goals, constraints, and requirements for the reload cycle. Westinghouse design and manufacturing requirements were also incorporated. The Unit 3 Cycle 20 design criteria were approved by DNPS and NF management prior to the development and finalization of the core loading pattern.

Using the approved design criteria, Westinghouse and NF core reload design engineers performed numerous iterations on proposed SVEA-96 Optima2 bundle designs and core loading patterns. Designs were modeled and evaluated in both the Westinghouse POLCA7 core model and the NF MICROBURN-B2 core model. Engineers in both organizations reviewed proposed designs and collectively revised these designs until the design criteria were met. Based on a comparison of the results from both core models to the design criteria, the core design was determined to ensure that cycle energy requirements, operating thermal margin

goals, licensing requirements, and other design criteria were satisfied. In addition, the final bundle designs were reviewed to ensure that they comply with the Westinghouse SVEA-96 Optima2 fuel manufacturing criteria.

Since this is the first reload of Westinghouse SVEA-96 Optima2 fuel at DNPS, and as yet there is no operating data from a DNPS core that contains SVEA-96 Optima2 fuel, there may be a relatively higher than normal uncertainty in the current prediction of the core reactivity and/or power distribution throughout the cycle. To account for this, thermal margins and cold shutdown margin were increased relative to recent DNPS cycles. In addition, in order to ensure that there will be sufficient operational flexibility, the core loading pattern was required to comply with the design thermal margin goals even if the core reactivity and operating control rod patterns are somewhat different than those that were developed based on the nominal hot core reactivity assumptions. This approach helped to ensure that the Cycle 20 core can be expected to operate at the targeted core thermal power levels with adequate thermal margins, even if the actual core reactivity and/or power distribution is somewhat different than predicted. In this way, sufficient operational flexibility and flexible control rod patterns were built into the design.

The prediction of the cycle energy capability for a given core design is dependent on the hot reactivity bias (i.e., hot target eigenvalue) that is assumed for the design cycle. This reactivity bias is also dependent on the three-dimensional core simulator code used to perform the design. Since the Unit 3 Cycle 20 core design was developed in collaboration between Westinghouse and NF using both the POLCA7 and MICROBURN-B2 core models, separate reactivity biases were established for use with each model. For POLCA7, Westinghouse used historical plant, bundle, and cycle operational data provided by NF to develop POLCA7 core models of recent DNPS cycles. Then, Westinghouse and NF reviewed the results of this POLCA7 benchmark and determined appropriate POLCA7 reactivity biases (i.e., hot and cold target eigenvalues) for use with the Unit 3 Cycle 20 core design. In a similar manner, MICROBURN-B2 eigenvalue trends from recent DNPS cycles were reviewed to determine appropriate MICROBURN-B2 hot and cold target eigenvalues.

USAG14 Correlation

The USAG14 correlation is the Westinghouse CPR correlation for GE14 fuel used in the Unit 3 Cycle 20 reload design and licensing analyses, and is the same correlation as that used to support the Reference 5 amendment for QCNPS, Unit 2 Cycle 19. As described in Reference 6, the USAG14 correlation does sufficiently address the GNF Part 21 issue (i.e., Reference 7) with respect to critical power determination. The USAG14 correlation was generated based on GEXL14 CPR data that already reflect the GNF corrections to the GEXL14 CPR correlation that were made in response to the GNF Part 21 issue. Therefore, CPRs calculated with the USAG14 correlation match the values from the Part 21 corrected GEXL14 correlation (i.e., the GEXL14 correlation data revised by GNF to address the Part 21 issue).

The USAG14 correlation was developed using the NRC-approved methodology described in Reference 3. The USAG14 correlation, including a detailed description of the methodology used to develop the correlation, was submitted to the NRC in response to a request for additional information (i.e., response to NRC Request 8 in Attachment 2 of Reference 8) in support of an amendment request to allow the transition to SVEA-96 Optima2 fuel at DNPS and QCNPS. The NRC approved that amendment for DNPS and QCNPS in Reference 4.

In Attachment 7 of Reference 9, EGC submitted information to the NRC to address the measures taken to ensure compliance with the limitations and conditions discussed in the NRC's safety evaluation for CENPD-300-P-A. Attachment 7 of Reference 9 also included a description of the methodology used to derive the conservative adder to the operating limit minimum critical power ratio (OLMCPR), as required by Condition/Limitation 7 of the NRC safety evaluation for CENPD-300-P-A.

Adjustment Factor

As described in Section 4 of Attachment 4, an adjustment factor is applied when using the USAG14 correction. The adjustment factor applying to the USAG14 correlation is conservative. The adjustment factor is specifically applied to establish the GE14 fuel OLMCPR that satisfies the 95/95 statistical criterion. A description of the process in generating USAG14 was previously provided to the NRC in response to NRC Request 8 in Attachment 2 of Reference 8.

Core Flow Uncertainty

The total core flow uncertainty values for dual-loop and single-loop operations that were applied for the Unit 3 Cycle 20 SLMCPR calculation are the same as those used in SLMCPR calculations for recent DNPS cycles. These uncertainties are consistent with values provided in General Electric (GE) Nuclear Energy topical report NEDC-32601P-A (i.e., Reference 10), in which GE updated their methodology and the inputs to be used in SLMCPR evaluations. Reference 10 concluded that these core flow uncertainty values, which had also been previously approved for General Electric BWR Thermal Analysis Basis (GETAB) analyses, continued to be applicable and conservative. In Reference 1, the NRC approved NEDC-32601P.

The total core flow uncertainty values are based on system performance. There is no impact on the total core flow uncertainty values as a result of the mixed core, since the GE14 and SVEA-96 Optima2 fuel are hydraulically compatible.

Procedures to Apply Two Sets of Safety Limits to Cycle 20

Consistent with the Westinghouse reload licensing methodology described in Reference 3, unique SLMCPR values have been established for each fuel product line present in the Unit 3 Cycle 20 core. Specifically, one set of SLMCPR values will be applied to the SVEA-96 Optima2 fuel, and another set will be applied to the co-resident GE14 fuel.

The SLMCPR values are applied via the determination and application of the OLMCPR. The OLMCPR values are established based on the SLMCPR and the results of the Westinghouse cycle-specific reload licensing analyses. From these analyses, unique sets of OLMCPR values are established for the SVEA-96 Optima2 and GE14 fuel. The OLMCPR values for each fuel type are then documented in the COLR.

In order to monitor operation to the limits in the COLR, the OLMCPR sets are specified in the core monitoring system input deck. DNPS currently monitors operation with the POWERPLEX-III core monitoring system, which has flexible inputs and monitoring capabilities, such that the OLMCPR sets can be input and applied to each fuel type.

Technical Specification 3.2.2, "Minimum Critical Power Ratio (MCPR)," requires all MCPRs to be greater than or equal to the MCPR operating limits specified in the COLR. Surveillance Requirement 3.2.2.1 requires verification of all MCPR limits every 24 hours. The core monitoring system calculates the MCPR of every fuel assembly, and the limiting results are displayed in the control room using the appropriate OLMCPR for each fuel type. Action to reduce the limiting MCPR is taken if the core approaches the limits. For Unit 3 Cycle 20, the differences in the GE14 and SVEA-96 Optima2 SLMCPR values will be accounted for by the core monitoring system when it determines the limiting MCPR values based on the appropriate GE14 or SVEA-96 Optima2 OLMCPR set.

GE14 fuel will be monitored with the GNF GEXL14 correlation, while Westinghouse will use their USAG14 correlation for GE14 fuel to determine the appropriate GE14 OLMCPR in the cycle-specific reload licensing analyses. The application of these two CPR correlations for GE14 fuel in this way is consistent with Reference 3.

For SVEA-96 Optima2 fuel, the approach is simpler in that the same Westinghouse CPR correlation used by Westinghouse in the reload licensing analyses will be installed into the core monitoring system. As a result, the SVEA-96 Optima2 fuel will be licensed and monitored with the same Westinghouse CPR correlation.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (EGC) requests an amendment to Renewed Facility Operating License No. DPR-25 for Dresden Nuclear Power Station (DNPS), Unit 3. The proposed change revises the values of the safety limit minimum critical power ratio (SLMCPR) in Technical Specification (TS) Section 2.1.1, "Reactor Core SLs." Specifically, the proposed change would require that for Unit 3, the minimum critical power ratio (MCPR) for Global Nuclear Fuel (GNF) fuel shall be $\geq$ 1.10 for two recirculation loop operation, or $\geq$ 1.11 for single recirculation loop operation. Additionally, the proposed change would require that MCPR for Westinghouse fuel shall be $\geq$ 1.12 for two recirculation loop operation, or $\geq$ 1.14 for single recirculation loop operation. This change is needed to support the next cycle of Unit 3 operation.

According to 10 CFR 50.92, "Issuance of amendment," paragraph (c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(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.

ATTACHMENT 1
Evaluation of Proposed Change

EGC has evaluated the proposed change to the TS for DNPS, Unit 3, using the criteria in 10 CFR 50.92, and has determined that the proposed change does not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards consideration.

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

   Response: No

   The probability of an evaluated accident is derived from the probabilities of the individual precursors to that accident. The consequences of an evaluated accident are determined by the operability of plant systems designed to mitigate those consequences. Limits have been established consistent with NRC-approved methods to ensure that fuel performance during normal, transient, and accident conditions is acceptable. The proposed change conservatively establishes the SLMCPR for DNPS, Unit 3, Cycle 20 such that the fuel is protected during normal operation and during plant transients or anticipated operational occurrences (AOOs).

   Changing the SLMCPR does not increase the probability of an evaluated accident. The change does not require any physical plant modifications, physically affect any plant components, or entail changes in plant operation. Therefore, no individual precursors of an accident are affected.

   The proposed change revises the SLMCPR to protect the fuel during normal operation as well as during plant transients or AOOs. Operational limits will be established based on the proposed SLMCPR to ensure that the SLMCPR is not violated. This will ensure that the fuel design safety criterion (i.e., that at least 99.9% of the fuel rods do not experience transition boiling during normal operation and AOOs) is met. Since the proposed change does not affect operability of plant systems designed to mitigate any consequences of accidents, the consequences of an accident previously evaluated are not expected to increase.

   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

   Creation of the possibility of a new or different kind of accident requires creating one or more new accident precursors. New accident precursors may be created by modifications of plant configuration, including changes in allowable modes of operation. The proposed change does not involve any plant configuration modifications or changes to allowable modes of operation. The proposed change to the SLMCPR assures that safety criteria are maintained for DNPS, Unit 3, Cycle 20.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No

The SLMCPR provides a margin of safety by ensuring that at least 99.9% of the fuel rods do not experience transition boiling during normal operation and AOOs if the MCPR limit is not violated. The proposed change will ensure the current level of fuel protection is maintained by continuing to ensure that at least 99.9% of the fuel rods do not experience transition boiling during normal operation and AOOs if the MCPR limit is not violated. The proposed SLMCPR values were developed using NRC-approved methods. Additionally, operational limits will be established based on the proposed SLMCPR to ensure that the SLMCPR is not violated. This will ensure that the fuel design safety criterion (i.e., that no more than 0.1% of the rods are expected to be in boiling transition if the MCPR limit is not violated) is met.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above, EGC concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical specifications," paragraph (c)(1), requires that power reactor facility TS include safety limits for process variables that protect the integrity of certain physical barriers that guard against the uncontrolled release of radioactivity. The fuel cladding integrity SLMCPR is established to assure that at least 99.9% of the fuel rods in the core do not experience boiling transition during normal operation and AOOs. Thus, SLMCPR is required to be contained in TS.

10 CFR 50, Appendix A, General Design Criterion (GDC) 10 requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of AOOs. To ensure compliance with GDC 10, EGC has performed the plant-specific SLMCPR analyses using NRC-approved methodologies as prescribed in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 4.4. The SLMCPR ensures that sufficient conservatism exists in the operating limit MCPR such that, in the event of an AOO, there is a reasonable expectation that at least 99.9% of the fuel rods in the core will avoid boiling transition for the power distribution within the core including all uncertainties.

In conclusion, based on the considerations discussed above, (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.

6.0 ENVIRONMENTAL CONSIDERATION

EGC has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, paragraph (b), no environmental impact statement or environmental assessment needs be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Letter from F. Akstulewicz (NRC) to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations;' NEDC-32694P, 'Power Distribution Uncertainties for Safety Limit MCPR Evaluation;' and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR (TAC Nos. M97490, M99069, and M97491)," dated March 11, 1999

2. NEDO-10958-A, "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation, and Design Application," dated January 1977

3. CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," dated July 1996

4. Letter from M. Banerjee (NRC) to C. M. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 - Issuance of Amendments Re: Transition to Westinghouse Fuel and Minimum Critical Power Ratio Safety Limits (TAC. Nos. MC7323, MC7324, MC7325 and MC7326)," dated April 4, 2006

5. Letter from M. Banerjee (NRC) to C. M. Crane (Exelon Generation Company, LLC), "Quad Cities Nuclear Power Station, Unit 2 – Issuance of Amendment Re: Minimum Critical Power Ratio Safety Limit (TAC No. MC9243)," dated March 31, 2006

6. Letter from P. R. Simpson (Exelon Generation Company, LLC) to NRC, "Additional Information Supporting Request for Technical Specifications Change for Minimum Critical Power Ratio Safety Limit," dated February 13, 2006

7. Letter from J. S. Post (GE Energy) to NRC, "Part 21 60 Day Interim Report Notification: Critical Power Determination for GE14 and GE12 Fuel With Zircaloy Spacers," dated June 24, 2005

8. Letter from P. R. Simpson (Exelon Generating Company, LLC) to NRC, "Additional Information Supporting Request for License Amendment Regarding Transition to Westinghouse Fuel," dated January 26, 2006

9. Letter from P. R. Simpson (Exelon Generation Company, LLC) to NRC, "Request for License Amendment Regarding Transition to Westinghouse Fuel," dated June 15, 2005

10. NEDC-32601P-A, "Methodology and Uncertainties for Safety Limit MCPR Evaluations," dated August 1999

ATTACHMENT 2
Markup of Proposed Technical Specifications Page

DRESDEN NUCLEAR POWER STATION, UNIT 3

RENEWED FACILITY OPERATING LICENSE NO. DPR-25

REVISED TECHNICAL SPECIFICATIONS PAGE

2.0-1

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ 25% RTP.

2.1.1.2 With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

For Unit 2 two recirculation loop operation, MCPR shall be ≥ 1.11, or for single recirculation loop operation, MCPR shall be ≥ 1.12.

~~For Unit 3 two recirculation loop operation, MCPR shall be ≥ 1.10, or for single recirculation loop operation, MCPR shall be ≥ 1.11.~~

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be ≤ 1345 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Insert all insertable control rods.

For Unit 3, MCPR for GNF fuel shall be ≥ 1.10 for two recirculation loop operation, or ≥ 1.11 for single recirculation loop operation. MCPR for Westinghouse fuel shall be ≥ 1.12 for two recirculation loop operation, or ≥ 1.14 for single recirculation loop operation.

ATTACHMENT 3
Markup of Technical Specifications Bases Pages

DRESDEN NUCLEAR POWER STATION, UNIT 3

RENEWED FACILITY OPERATING LICENSE NO. DPR-25

REVISED TECHNICAL SPECIFICATIONS BASES PAGES

B 2.1.1-3
B 2.1.1-4
B 2.1.1-6

BASES

APPLICABLE SAFETY ANALYSES (continued)

2.1.1.1 Fuel Cladding Integrity

The use of the Siemens Power Corporation correlation (ANFB) is valid for critical power calculations at pressures > 600 psia and bundle mass fluxes > 0.1 x 10^6 lb/hr-ft^2 (Refs. 2 and 3). The use of the General Electric (GEXL) Critical Power correlation (GEXL) is valid for critical power calculations at pressures > 785 psig and core flows > 10% (Ref. 4). For operation at low pressures or low flows, the fuel cladding integrity SL is established by a limiting condition on core THERMAL POWER, with the following basis:

The use of the Westinghouse critical power correlation (D4.1.1) is valid for critical power calculations at pressures > 362 psia and bundle mass fluxes > 0.23 x 10^6 lb/hr-ft^2 (Ref. 7).

Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be > 4.5 psi. Analyses show that with a bundle flow of 28 x 10^3 lb/hr (approximately a mass velocity of 0.25 X 10^6 lb/hr-ft^2), bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be > 28 x 10^3 lb/hr. Full scale critical power test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 MWt. With the design peaking factors, this corresponds to a THERMAL POWER > 50 % RTP. Thus, a THERMAL POWER limit of 25% RTP for reactor pressure < 785 psig is conservative. Although the ANFB correlation is valid at reactor steam dome pressures > 600 psia, application of the fuel cladding integrity SL at reactor steam dome pressure < 785 psig is conservative.

and the Westinghouse D4.1.1 correlation is valid at reactor steam dome pressures > 362 psia,

2.1.1.2 MCPR

The MCPR SL ensures sufficient conservatism in the operating MCPR limit that, in the event of an AOO from the limiting condition of operation, at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition. The margin between calculated boiling transition (i.e., MCPR = 1.00) and the MCPR SL is based on a detailed statistical procedure that considers the uncertainties in monitoring the core operating state. One specific uncertainty included in the SL is the uncertainty inherent

(continued)

BASES

APPLICABLE SAFETY ANALYSES

2.1.1.2 MCPR (continued)

in the fuel vendor's critical power correlation. ~~References 2, 3, 4 and 5~~ describe the methodology used in determining the MCPR SL.

References 2, 3, 4, 5, and 8

The fuel vendor's critical power correlation is based on a significant body of practical test data, providing a high degree of assurance that the critical power, as evaluated by the correlation, is within a small percentage of the actual critical power being estimated. As long as the core pressure and flow are within the range of validity of the correlation, the assumed reactor conditions used in defining the SL introduce conservatism into the limit because bounding high radial power factors and bounding flat local peaking distributions are used to estimate the number of rods in boiling transition. These conservatisms and the inherent accuracy of the fuel vendor's correlation provide a reasonable degree of assurance that there would be no transition boiling in the core during sustained operation at the MCPR SL. If boiling transition were to occur, there is reason to believe that the integrity of the fuel would not be compromised. Significant test data accumulated by the NRC and private organizations indicate that the use of a boiling transition limitation to protect against cladding failure is a very conservative approach. Much of the data indicate that BWR fuel can survive for an extended period of time in an environment of boiling transition.

2.1.1.3 Reactor Vessel Water Level

During MODES 1 and 2 the reactor vessel water level is required to be above the top of the active irradiated fuel to provide core cooling capability. With fuel in the reactor vessel during periods when the reactor is shut down, consideration must be given to water level requirements due to the effect of decay heat. If the water level should drop below the top of the active irradiated fuel during this period, the ability to remove decay heat is reduced. This

(continued)

BASES (continued)

REFERENCES

1. UFSAR, Section 3.1.2.2.1.

2. ANF-524(P)(A) and Supplements 1 and 2, Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors, (as specified in Technical Specification 5.6.5).

3. ANF-1125(P)(A) and Supplements 1 and 2, ANFB Critical Power Correlation, Advanced Nuclear Fuels Corporation, (as specified in Technical Specification 5.6.5).

4. NEDE-24011-P-A, General Electric Standard Application for Reactor Fuel (GESTAR) (as specified in Technical Specification 5.6.5)

5. ANF-1125(P)(A), Supplement 1, Appendix E, ANFB Critical Power Correlation Determination of ATRIUM-9B Additive Constant Uncertainties, Siemens Power Corporation, (as specified in Technical Specification 5.6.5).

6. 10 CFR 100.

7. WCAP-16081-P-A, "10x10 SVEA Fuel Critical Power Experiments and CPR Correlation: SVEA-96 Optima2" (as specified in Technical Specification 5.6.5).

8. CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel" (as specified in Technical Specification 5.6.5).

ATTACHMENT 5

Westinghouse Application for Withholding, Affidavit, and Non-Proprietary Version of Attachment 4

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U.S. Nuclear Regulatory Commission
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Our ref: CAW-06-2179

July 20, 2006

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: NF-BEX-06-167 Rev. 2 P-Attachment, "Dresden Unit 3 Cycle 20 SLMCPR" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-06-2179 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Exelon Generation.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-06-2179 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: M. Banerjee/NRR
F. M. Akstulewicz/NRR
G. S. Shukla/NRR

CAW-06-2179

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Sworn to and subscribed
before me this 20th day
of July, 2006

Sharon L. Fiori
Notary Public

Notarial Seal
Sharon L. Fiori, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires January 29, 2007
Member, Pennsylvania Association Of Notaries

(1) I am Manager, Regulatory Compliance and Plant Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in NF-BEX-06-167 Rev. 2 P-Attachment "Dresden Unit 3 Cycle 20 SLMCPR" (Proprietary), for review and approval, being transmitted by Exelon Nuclear letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for "Dresden Unit 3 Cycle 20 SLMCPR" for review and approval.

This information is part of that which will enable Westinghouse to:

(a) Support Exelon's use of Westinghouse Fuel at Quad City and Dresden.

(b) Assist customer to obtain license change.

Further this information has substantial commercial value as follows:

(a) Westinghouse can use this information to further enhance their licensing position with their competitors.

(b) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar analyses and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

Proprietary Information Notice

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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