September 28, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 - REVIEW OF INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS (IPEEE) SUBMITTAL (TAC NOS. M83616 AND M83617)

Dear Mr. Kingsley:

Enclosed is the Nuclear Regulatory Commission's (NRC's) Staff Evaluation Report (SER) on its review of the Dresden Nuclear Power Station, Units 2 and 3 (DNPS), IPEEE submittal. Also included with the SER are the contractors' Technical Evaluation Reports (TERs) in the seismic and fire areas, and the staff's TER in the high winds, floods, and other external events (HFO) area.

A screening review was performed which examined the IPEEE results for their "completeness and reasonableness" considering the design and operation of the plant. On the basis of this review and further review by a senior review board (SRB), the staff concluded that the aspects of seismic, fires, and HFO events are adequately addressed. The SRB is comprised of RES and NRR staff and RES consultants (Sandia National Laboratories) with probabilistic risk assessment expertise in external events. The staff's review findings are summarized in the attached SER, and the details of the contractors' and staffs findings in their TERs are included as appendices to the SER.

For the seismic analysis, DNPS is categorized as a 0.3g focused-scope plant (per NUREG-1407). To perform the seismic evaluation, the licensee used the Electric Power Research Institute's (EPRI) seismic margins assessment methodology as described in EPRI NP-6041-SL. Since the seismic margins approach was used, no quantitative estimate was made for the seismic contribution to plant core damage frequency (CDF). For fire events, the licensee performed a fire probabilistic safety assessment based on EPRI's Fire-Induced Vulnerability Evaluation (FIVE) approach and the EPRI Fire Probabilistic Risk Assessment Implementation Guide. The licensee estimated that the contribution to plant CDF from fires was approximately 1.7E-5 per reactor-year (ry) for Unit 2 and 3.1E-5/ry for Unit 3. These results are based on the use of improved fire risk models that have less conservatism than the licensee's original fire analysis. The licensee evaluated HFO events using the progressive screening approach consistent with the guidance in NUREG-1407. Since DNPS was designed prior to the issuance of the 1975 Standard Review Plan (SRP), the plant was not designed according to the SRP criteria. The licensee did not quantitatively estimate the contribution to CDF from HFO events since these events were screened out. The licensee performed walkdowns to confirm that no

plant changes had occurred since the plant was licensed that would impact on the IPEEE review. In its Individual Plant Examination (IPE) submittal, the licensee estimated the total CDF from internal events to be approximately 1.9E-5/ry for both Units 2 and 3, including internal flooding.

The licensee stated that no vulnerabilities were identified during its IPEEE review but did not provide criteria to explicitly define what would constitute a plant vulnerability. In the seismic area, the licensee stated that a number of improvements were implemented during the resolution of Unresolved Safety Issue (USI) A-46 (Verification of Seismic Adequacy of Equipment in Operating Plants) and that additional improvements were still under consideration. Seismic-related improvements that the licensee cited as having been completed included modifications to anchorages of electrical buses and distribution panels. In response to an NRC request for additional information regarding the licensee's seismic IPEEE evaluation, the licensee stated that the concept of providing a seismically qualified/verified make-up path to each plant unit's isolation condenser was being developed, and that the design changes required to implement this concept will be completed in conjunction with the approved schedule for resolution of the USI A-46 outliers. The operator actions required for the proposed seismically qualified/verified makeup path to the isolation condenser will be submitted to the NRC when they are developed. In addition, the licensee stated that a study will be performed to ensure that a small break loss-of-coolant accident (LOCA), with no torus cooling but with the isolation condenser in operation, does not result in unacceptable torus temperature. Furthermore, the licensee indicated that the resolution of questions concerning the seismic capacity of the other IPEEE-related components, including a group of relays associated with the isolation condensers, is still planned as part of the USI A-46 program.

Regarding fires, the licensee stated that two hydrogen-related systems would be modified (seismically mounted) to reduce the risk associated with a seismic/fire event. No plant improvements were identified in the HFO events area that were the direct result of the IPEEE. However, two improvements that were related to HFO events were cited as resulting from the Systematic Evaluation Program (SEP) that was completed prior to the IPEEE program. These were the addition of scuppers to aid in draining water from roofs during heavy precipitation and revisions made to the site flood emergency plan.

The licensee has addressed generic safety issues (GSIs) GSI-57, "Effects of Fire Protection System Actuation on Safety-Related Equipment," GSI-103, "Design for Probable Maximum Precipitation," and the Sandia Fire Risk Scoping Study (FRSS) issues which were explicitly requested in Supplement 4 to Generic Letter (GL) 88-20 and its associated guidance in NUREG-1407. These issues are considered resolved. USI A-45, "Shutdown Decay Heat Removal Requirements," is considered resolved contingent upon the licensee resolving the isolation condenser makeup seismic issues. The need for any additional assessment or actions related to the USI A-45 follow-up actions will be addressed by the NRC staff separately from the IPEEE program.

On the basis of the IPEEE review, the staff concludes that the licensee's process is capable of identifying the most likely severe accidents and severe accident vulnerabilities and, therefore, that DNPS has met the intent of Supplement 4 to GL 88-20.

In addition, the licensee's IPEEE submittal contains some specific information that addresses the external event aspects of certain other GSIs, i.e., GSI-147, "Fire-Induced Alternate Shutdown/Control Room Panel Interactions," GSI-148, "Smoke Control and Manual Fire-Fighting Effectiveness," and GSI-172, "Multiple System Responses Program (MSRP)." Based on the review of information contained in the submittal, the staff believes that the licensee's process is capable of identifying potential vulnerabilities associated with these issues. On the basis that no potential vulnerabilities associated with the external event aspects of these issues were identified at DNPS, the staff considers these issues resolved for DNPS. With respect to GSI-156, "Systematic Evaluation Program," the licensee plans to perform follow-up actions to resolve the isolation condenser makeup seismic issues mentioned earlier. The external events aspects of GSI-156 are considered resolved contingent upon resolution of the isolation condenser makeup seismic issues.

It should be noted that the staff focused its review primarily on the licensee's ability to examine DNPS for severe accident vulnerabilities. Although certain aspects of the IPEEE were explored in more detail that others, the review was not intended to validate the accuracy of the licensee's detailed findings (or quantitative estimates) that underlie or stem from the examination. Therefore, this evaluation report does not constitute NRC approval or endorsement of any IPEEE material for purposes other than those associated with meeting the intent of Supplement 4 to GL 88-20 and the resolution of specific generic safety issues discussed in the enclosed SER.

If you have any questions concerning the evaluation, please call me at 301-415-2863.

Sincerely,

/RA/

Lawrence W. Rossbach, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

Enclosure: Staff Evaluation Report w/attachments

cc w/encl: See next page

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