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MEMORANDUM TO: John A. Zwolinski, Director
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

FROM: Thomas L. King, Director *Thomas LK*
 Division of Risk Analysis and Applications
 Office of Nuclear Regulatory Research

SUBJECT: REVIEW OF SURRY POWER STATION UNITS 1 & 2 INDIVIDUAL
 PLANT EXAMINATION OF EXTERNAL EVENTS (IPEEE) SUBMITTAL

Attached is RES's Staff Evaluation Report (SER) on its review of the IPEEE submittal for Surry Power Station, Units 1 and 2. Also included with the SER are a contractor Technical Evaluation Report (TER) on the seismic portion of the IPEEE submittal, a contractor TER on the fire portion of the IPEEE submittal, and a staff TER on the high winds, floods, transportation and other external events (HFO) portion of the IPEEE submittal. We recommend that the enclosed reports be formally issued to document the staff's findings and conclusions.

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 high winds, floods, transportation and other external events were adequately addressed. The SRB is comprised of RES and NRR staff and RES consultants (Sandia National Laboratories) with probabilistic risk assessment expertise for external events. The staff's review findings are summarized in the attached SER, and the details of the findings of the contractors and staff appear in the TERs attached to the SER.

The licensee estimated the seismic core damage frequency as 8E-6 per year, using the EPRI hazard curves and a uniform hazard spectrum, and estimated the fire core damage frequency to be 6E-6 per year from the fire areas which were not screened out. For HFO events, the licensee used the progressive screening approach given in the staff's IPEEE submittal guidance document, NUREG-1407, and core damage frequencies were not obtained. The licensee's analysis was for Unit 1, but the licensee considered the analysis applicable to both units because of minimal differences between the units.

The licensee did not define the term vulnerability. However, the licensee used the NEI 91-04 severe accident closure guidelines to evaluate plant improvements, and this implies a definition of vulnerability. The licensee states that no vulnerabilities were found. Nevertheless, several plant improvements or operational enhancements were made or were to be made by the licensee. In the seismic area, about sixty pieces of equipment were enhanced via modification, consisting primarily of anchorage modifications and bolting together cabinets to prevent seismic

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interaction. In the fire area, procedural enhancements were to be made. In the HFO area, parapets on the turbine building were to be modified to reduce roof ponding, and procedures were to be implemented to mitigate the effects of flooding of the turbine building by opening of doors to the turbine basement, and by protecting the control room doors from water ingress.

As a part of the IPEEE, Unresolved Safety Issue (USI) USI A-45, "Shutdown Decay Heat Removal Requirements," and Generic Safety Issues (GSIs) GSI-57, "Effects of Fire Protection System Actuation on Safety-Related Equipment," GSI-103, "Design for Probable Maximum Precipitation (PMP)," GSI-131, "Potential Seismic Interaction Involving the Movable In-Core Flux Mapping System Used In Westinghouse Plants," and the Sandia Fire Risk Scoping Study (FRSS) issues were specifically identified during the initial planning of the IPEEE program and explicitly discussed in Supplement 4 to Generic Letter (GL) 88-20 and its associated guidance in NUREG-1407 as needing to be addressed in the IPEEE. The specific information associated with each issue is identified and discussed in the attached SER. Based on the review of the information contained in the submittal, the staff believes that the licensee's process is capable of identifying potential vulnerabilities associated with USI A-45, GSI-57, GSI-103, GSI-131 and the FRSS issues. All of the issues called out directly in Supplement 4 to GL 88-20 and its associated guidance document are considered resolved on the basis that the process used by the licensee to identify vulnerabilities associated with these issues is judged to be capable of identifying any potential vulnerabilities, and the licensee found no vulnerabilities.

On the basis of the IPEEE review, the staff concludes that the licensee's IPEEE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities and, therefore, that the IPEEE submittal for the Surry Power Station Units 1 and 2 has met the intent of Supplement 4 to Generic Letter 88-20.

In addition, the licensee's IPEEE submittal contains some specific information that addresses the external event aspects of certain other generic issues: GSI-147, "Fire-Induced Alternate Shutdown/Control Room Panel Interactions" (also a FRSS issue); GSI-148, "Smoke-Control and Manual Fire Fighting Effectiveness;" GSI-156, "Systematic Evaluation Program (SEP);" and GSI-172, "Multiple System Responses Program (MSRP)." The specific information associated with each issue is identified and discussed in the attached SER. The staff considers that the licensee's process for the analysis of these issues is capable of identifying potential vulnerabilities associated with these issues. Since no vulnerabilities associated with the external events aspects of these issues were found, the staff considers these issues resolved for the Surry Power Station, Units 1 and 2.

Although there were no vulnerabilities identified associated with the generic issues, or external events in general, there were certain cost-effective plant improvements which the licensee identified they would make, and there were open items at the time of submittal of the licensee's IPEEE seismic and non-seismic submittals. In particular, there were: procedures to be implemented to reduce the risk associated with GSI-103; modifications of the turbine roof parapets, also associated with GSI-103; open items regarding restraints on hydrogen cylinders and various seismic issues detailed in Table 6.1-1 of the licensee's IPEEE seismic submittal; and determination of whether a stainless steel tube connected to a hydrogen line was sufficiently flexible or whether a modification had to be made, which is associated with the

MSRP issue on hydrogen lines. Because of the plant specific nature of these issues, it is expected that NRR will follow-up on these issues, outside of the IPEEE program.

If you have any questions regarding the attached SER, please contact Arthur Buslik (415-6184). When the SER is issued to the licensee, please put the following staff on distribution: Arthur Buslik, RES; Alan Rubin, RES; and Doug Coe, NRR.

Attachments: As stated

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