

November 13, 2009

The Honorable Robert Menendez
United States Senate
Washington, DC 20510

Dear Senator Menendez:

Thank you for your letter of May 21, 2009, in which you expressed concern regarding the U. S. Nuclear Regulatory Commission (NRC) staff's review of the 3-D finite element analysis (3-D FEA) of the Oyster Creek (OC) drywell shell. I am responding now to include the recent conclusions by the Advisory Committee on Reactor Safeguards (ACRS) on this analysis in order to present a full account of our efforts. I want to assure you that safe and secure operations of the Oyster Creek nuclear power plant are of primary importance to the NRC. The concerns you raise are important and have been addressed in our review. The Commission has considered your request to have Sandia National Laboratories (Sandia) review the 3-D FEA and has concluded that substantial and sufficient analyses and reviews have been performed of the drywell shell. Sandia has previously analyzed the drywell shell and concluded that the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements were met. Three separate analyses of the drywell shell and independent reviews of the analyses have concluded that there is sufficient margin and confirmed that the ASME Code requirements have been met, such that the plant can be operated safely for the additional 20-year license period. Under these circumstances, we do not believe that a review of the 3-D FEA by Sandia is necessary to ensure public safety.

As noted in Enclosure 1, the 3-D FEA performed by Structural Integrity Associates (SIA) is one of three separate analyses that have been performed for OC's drywell shell. The analysis of record for the drywell, as referenced in OC's Final Safety Analysis Report, was conducted by General Electric in the early 1990's timeframe and was independently reviewed by structural engineering experts at Brookhaven National Laboratory. The analysis performed by Sandia in the 2006 timeframe was requested by NRC staff as part of the OC license renewal review and was reviewed by the ACRS, the NRC's independent oversight panel for reactor safety issues, which reviews all license renewal applications. The 3-D FEA was performed by SIA, a contractor to the licensee (Exelon), in the 2008 timeframe, and was submitted by Exelon in response to comments from the ACRS. The 3-D FEA, besides being reviewed by the NRC staff, was also independently reviewed by Becht Nuclear Services (Becht), a contractor engaged by the State of New Jersey. Becht's review of the 3-D FEA concluded that OC's drywell shell met the ASME Code requirements.

The three separate analyses used different approaches to model the current state of the drywell shell and concluded that OC's drywell shell meets the ASME Code requirements, ensuring public safety. The modification to the capacity reduction factor (CRF), as used by General Electric and SIA, was supported by extensive testing by a structural engineering expert who was working at the vendor that designed and built OC's drywell shell. His approach for modifying the CRF has been well-vetted through the ASME consensus Code process. The ASME Code committee is an independent body that uses a consensus process by gathering structural engineering experts from multiple organizations, including the national laboratories, to determine appropriate engineering practices. The results of their reviews are compiled into a

code and code cases, which are used internationally. The ASME approach for modifying the CRF used by General Electric and SIA has been reviewed and codified into three separate ASME Code cases. The three separate analyses and the rigorous CRF review by ASME provide confidence that the drywell shell will maintain structural integrity during the 20-year license period.

The Commission instructed the NRC staff, as informed by the recommendations in the Atomic Safety and Licensing Board Panel's (ASLBP) advisory opinion, to use its expertise and engineering judgment to scrutinize the 3-D FEA carefully. Registered professional structural engineers on the NRC staff with appropriate expertise performed the review. One of the engineers has 35 years of structural engineering experience in nuclear power plant applications and the other engineer has 40 years of experience, including 37 years in nuclear power plant applications. Both engineers represent the NRC in a number of organizations that develop standards, including the ASME, the American Concrete Institute (ACI), and the American Institute of Steel Construction. One of the engineers is a Fellow of the ACI and the American Society of Civil Engineers. Consistent with the Commission's April 1, 2009, Order, the staff performed a thorough review of the 3-D FEA that included an examination of the supporting documentation for the analysis and discussions with SIA.

Although the Commission adopted the recommendation in ASLBP Judge Abramson's separate advisory opinion that the staff "engage appropriate expertise to conduct a thorough examination of the analysis once submitted," the Commission did not direct the staff specifically to have Sandia review the 3-D FEA. The staff was directed to suitably and appropriately inform its review by the recommendations in the ASLBP Advisory Opinion. As discussed in Enclosure 1, the staff considered the ASLBP recommendations as part of its review. It is important to note that Sandia's analysis (performed in 2006 as part of NRC's license renewal review) already concluded that the ASME Code margins were met. Since the time that Sandia conducted its analysis, no new technical information has been identified that would change those conclusions.

Based on the comprehensive analyses and reviews performed to date, the NRC has concluded that the ASME Code requirements are met for OC's drywell shell. Additionally, the aging management programs that Exelon is implementing provide reasonable assurance that the OC containment structure will continue to satisfy its safety requirements throughout the additional 20-year license period.

Throughout the review of the OC license renewal application, the NRC has been committed to ensuring dissemination of public information on renewal issues and opportunities for public involvement. Our decision has been informed by the participation of interested parties in the adjudicatory process before the ASLB and the Commission. The agency has responded to correspondence expressing concerns about the drywell shell issue and has engaged in other public outreach to address the evaluations of the drywell shell. This involvement in agency adjudication and outreach is an important part of our commitment to fair and transparent regulation.

In your letter, you requested an outside review by Sandia of the OC analysis. For the reasons stated above, after considering the factors prescribed by the Commission, the staff determined that a review by Sandia was not needed. However, the ACRS was planning on conducting an information briefing and expanded it to complete an evaluation of the OC analysis. On September 23, 2009, the ACRS Subcommittee on Materials, Metallurgy, and Reactor Fuels held

a public meeting to review the OC 3-D FEA of the drywell shell. This meeting was noticed in the *Federal Register* and stakeholders who had previously expressed an interest in this matter were notified of the meeting. The NRC staff, Exelon, and external stakeholders presented information on the analysis to the ACRS Subcommittee for its consideration. Subsequently, on October 8, 2009, the ACRS Full Committee held a public meeting to review the SIA 3-D FEA. This meeting was also noticed in the *Federal Register*, and the NRC staff and Exelon presented information to the Full Committee on the 3-D FEA. The ACRS assessed the 3-D FEA and the information provided by the NRC staff, licensee, and external stakeholders.

Based on its review, the ACRS issued a letter dated October 16, 2009 (Enclosure 2), which provides its findings and conclusion. The ACRS concluded that the analysis presented by Exelon fulfilled its commitment to provide a modern, realistic, 3-D FEA that better qualifies the available safety margin for the current configuration of the OC drywell shell. The ACRS also concluded that the analysis confirms that the OC drywell shell complies with its current licensing basis for design basis accidents with margin, and that the analysis was performed using good engineering practices and judgment and used conservatively biased realistic assumptions. I believe the review conducted by the ACRS is responsive to your request, and hope that it facilitates a greater understanding of the 3-D FEA and basis for acceptability.

Thank you for your interest in this matter. Please contact me or NRC's Office of Congressional Affairs if you need more information.

Sincerely,

/RA/

R. W. Borchardt
Executive Director
for Operations

Docket No. 50-219

Enclosures:
As stated

cc: See next page

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Letter to The Honorable Robert Menendez from R. W. Borchardt dated November 13, 2009

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