

From: John Craig , *ED*
To: Anton Vegel
Date: 11/23/01 7:24AM
Subject: Re: D.C. Cook Walls

tony,

Thanks for the input. As we discussed, the whole question/issue involved two parts: operability and design bases. The operability part has been discussed and documented at length. What is less clear to me is whether or not we have documented agency conclusions about the licensee meeting their design bases. Your summary would steer me to the June 11, 2001 meeting summary as the place to look first for a documented conclusion "NRR determined that no licensing basis changes were needed" or that "there is not an open question regarding compliance of D.C. Cook containment structures with design basis requirements."

We'll get a copy of the meeting summary, with a little luck there will be something there that can be used to address the remaining part of this issue.

John

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>>> Anton Vegel 11/21/01 01:45PM >>>

John

Attached is a summary of NRC activities regarding the D.C. Cook Containment Structural Issues. Please let me know when we could have a conference call next week, so we can hopefully come to closure on this issue.

If you have any questions please give me a call.

Thanks!

Tony V.

CC: Geoffrey Grant; Isabelle Schoenfeld; John Grobe; John Stang

D-14

Reg III

D.C. Cook Containment Walls Conformance to Design Basis

The D.C. Cook containment walls structural issues were an area of focus for the MC 0350 panel prior to the restart of both Units. To assure that the containment walls were operable, the MC 0350 panel designated the containment wall structural issue as a restart item with NRR as the lead. To disposition this issue NRR technical staff conducted extensive in process reviews of the licensee's calculations regarding the strength of the walls and the Transient Mass Distribution (TMD) inside containment. The TMD calculations were important in determining what forces would be acting on the walls in the case of a design basis accident.

In May and June, 2000, NRR technical staff conducted an audit of licensee design basis calculations. As a result of these reviews the staff concluded that the walls were operable based on the factor of safety exceeding 1.0. Specifically, the licensee calculated a factor of safety of 1.21 for the containment structural walls with the hydrogen recombiner wall being most limiting. The staff of NRR/DE/EMEB reviewed the results of the licensee's analysis and challenged some aspects of the analysis. Aspects challenged included use of Dynamic Increase Factors (DIF) and use of increased 90-day concrete strength. The NRC staff independently recalculated a safety factor of approximately 1.05 for the containment structural walls. The results of the NRC's review were documented in Restart Action Matrix closure documentation.

Regarding the DPV, the DPV submitter agreed that the Unit 2 containment walls were operable, and the DPV submitter accepted the staff's calculated safety factor of 1.05. However, the DPV submitter had an additional concern that the safety factor of 1.05 would be smaller if: (1) the 28-day concrete strength of 4807 psi was used in the analysis rather than 4867 psi, and (2) a 40 percent margin was included in the highest calculated differential pressure in the analysis.

The Ad Hoc DPV review panel reviewed these concerns and concluded that the NRR staffs' use of 4867 psi based on a 95/05 confidence computation was a generally accepted practice and a reasonable approach for determining the operability of the walls. In addition, the Ad Hoc DPV review panel concurred with the staff that there was no need for the 40 percent margin requirement in the pressure calculation per Standard Review Plan guidance.

Following the restart of D.C. Cook Unit 2 in June 2000, the focus of the MC 0350 panel shifted to ensuring that the Unit 1 containment walls were adequately assessed to assure operability, and that the licensee had a plan to restore both Units' containment walls to design basis requirements in a timely manner. Similar to the Unit 2 containment structural walls, in October and November 2000, NRR staff conducted extensive reviews of the licensee's calculations and determined the Unit 1 containment walls exceeded a safety factor of 1.0 and could be considered operable.

A difference between the two units' operability calculations was that Unit 1 calculations were more refined as the licensee was able to obtain more as-built critical dimensions from Unit 1 due to the steam generator replacement project and lessons learned from the Unit 2 effort. In addition, the methodology utilized by the licensee to assure operability was similar to the approach that they were using to address design basis conformance (i.e. Safety Factor greater than 1.5). The MC 0350 panel chairman requested documented assurance that the licensee was restoring the containment structural walls to design basis requirements in a timely manner. In response, the licensee committed to having the containment wall structural analysis complete in May 2001.

While the licensee was in the process of conducting analyses and performing calculations to assess design basis conformance, the NRR technical staff was kept apprized of the status of

the calculations. In addition, there were discussions between the licensee and technical staff regarding assumptions used in the calculations and the use of Dynamic Increase Factors (DIF) and increased 90-day concrete strength calculations, issues that were previously identified by NRR staff as being non-conservative. The licensee subsequently did not use the DIF in their calculations and used concrete strength values which were acceptable to the NRR staff.

In letters dated October 15, 2000, and May 9, 2001, the licensee communicated to the NRC the status of corrective actions related to demonstrating that Unit 1 and 2 containment structures could meet their design basis requirements. During the June 11, 2001, public meeting at headquarters between the licensee and NRR management and staff, the licensee stated that D.C. Cook containment structures were in compliance with the design basis. The licensee based this conclusion on their extensive transient mass distribution calculations and structural analysis. The methods used by the licensee to reach their conclusions were consistent with licensed codes and methods; therefore, NRR determined that no licensing basis changes were needed. In addition, the licensee determined that no modifications were warranted since all design basis requirements were met. The only actions remaining after the June 11, 2001, meeting involved the validation by the licensee during the next refueling outage of Unit 2 containment parameters that were utilized in the transient mass distribution and structural calculations.

The NRR technical staff and management involved with evaluating the licensee's approach for addressing the containment structural issues, and those who attended the June 11, 2001, public meeting, expressed satisfaction with the licensee's approach, assumptions, and conclusions. Consequently, there is not an open question regarding compliance of D.C. Cook containment structures with design basis requirements.

Since the June 11, 2001, meeting, the licensee has conducted walkdowns to confirm as-built Unit 2 containment parameters that were utilized in the TMD and structural calculations. The results of the walkdown confirmed that the parameters utilized in the calculations were the same as, or conservative to, the values used in the calculations.