

Enclosure 2

MEMORANDUM TO: John A. Grobe, Director  
Division of Reactor Safety  
Region III

FROM: Suzanne C. Black, Deputy Director  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 2 - CLOSEOUT OF  
RESTART ACTION MATRIX ISSUES DEALING WITH GENERIC  
LETTER 91-18 OPERABILITY EVALUATIONS

The Office of Nuclear Reactor Regulation (NRR) staff has reviewed your verbal request for technical assistance pertaining to auditing Indiana Michigan Power Company's (the licensee's) operability evaluations pursuant to Generic Letter 91-18. These issues are being tracked in the Restart Action Matrix (RAM) as R.3.8, R.3.12, R.3.13, R.3.14, R.3.15, R.3.16, and R.3.17.

- RAM ISSUE R.3.8:** Post-LOCA Control Room Dose, Noncompliance with GDC 19 Acceptance Criteria (see Attachment 1).
- RAM ISSUE R.3.12:** Tornado Missile - Related issue on Unit 2: Missile issue for the HVAC intake hoods located on the roof of the Electrical Switchgear Room and Spent Fuel Building (see Attachment 2). Unit 2 is currently in Mode 4. The licensee intends to address Mode 5 and 6 compensatory measures under the same severe weather procedures as Modes 1-4.
- RAM ISSUE R.3.13:** HELB - Licensing Basis Change Request for 10D on Plume and SRP, MEB 3-1 exclusion areas (see Attachment 3).
- RAM ISSUE R.3.14:** Methodology Changes to SGTR Analysis: Original 30 minute operator action time to isolate the affected Steam Generator to prevent overfill was not supported by analysis (see Attachment 4).
- RAM ISSUE R.3.15:** Loss of AC and Feedwater Analyses Revision: Input changes on positive MTC used to meet acceptance criteria, resulting in a reduction in safety margin for Unit 2 (see Attachment 5).

CONTACT: J. Stang, NRR  
(301) 415-1345

Enclosure 2

**RAM ISSUE R.3.16:** Auxiliary Building Engineered Safety Feature Ventilation System Filtration System Bypass Damper Redundancy: The previous charcoal filter bypass dampers were installed in series; because of excess leakage rates they were replaced, however, the replacement dampers were installed in parallel and are subject to single failure issues (see Attachment 6).

**RAM ISSUE R.3.17:** Changes in Input Assumptions and the UFSAR for Transient Mass Distribution (TMD) Analysis: Reconstitution of Sub-Compartment Blowdown Analysis and Assumptions Resulted in Differential Pressures Higher than in the UFSAR (see Attachment 7).

As discussed in the attachments, the NRR staff finds that the licensee's modifications, compensatory measures, and calculations provide reasonable assurance that the degraded or nonconforming conditions will not prevent the systems in question from performing their intended functions. Therefore, NRR recommends to the MC 0350 Restart Panel closure of the above RAM issues based on the attached documentation.

This concludes our efforts under TAC Nos. MA8958, MA9020, MA8968, MA8969, MA9022, MA9023, and MA8977.

Docket No. 50-316

Attachments: 1. RAM ISSUE R.3.8  
2. RAM ISSUE R.3.12  
3. RAM ISSUE R.3.13  
4. RAM ISSUE R.3.14  
5. RAM ISSUE R.3.15  
6. RAM ISSUE R.3.16  
7. RAM ISSUE R.3.17

## Enclosure 2

### RAM ISSUE R.3.8: CONTROL ROOM HABITABILITY

**BACKGROUND:** By letter dated October 28, 1998, the NRC documented the status of the current review of the D.C. Cook control room habitability evaluation. The letter documented an August 5, 1998, phone conversation where the licensee stated that the current control room ventilation dose calculations being evaluated by the NRC were determined to require technical and administrative upgrades. However, the licensee stated that the changes in the analysis did not affect the ability of the control room ventilation system to meet the requirements of GDC 19 or raise questions regarding the operability of these systems.

Following issuance of the letter, deficiencies in the Control Room Ventilation System (CRVS) were identified during the ESRR discovery process. The issues included single-failure problems related to control room isolation and pressurization and other deficiencies with control room dose assumptions, such as unfiltered in-leakage and atmospheric dispersion factors. In addition, a tracer gas test was conducted on the Unit 1 and Unit 2 control rooms, which resulted in higher than previously measured unfiltered in-leakage.

**LICENSEE'S CORRECTIVE ACTIONS:** As a result of the discovery of the nonconforming condition of the control room, the licensee followed the guidance contained in GL 91-18, Revision 1, and developed compensatory actions for the nonconforming condition. The licensee performed post-accident Control Room dose analysis, with the currently licensed TID-14844 source term, and determined that interim compliance with GDC 19 is achieved by operating with a more restrictive Reactor Coolant System (RCS) activity limit than the current Technical Specification (TS) limit of 1.0 micro-curies/gram dose equivalent I-131. The licensee is also using administrative controls to lower the allowable limits for total containment leakage and lower the allowable limits for total ECCS leakage. The licensee will also use KI for the operators as an additional compensatory measure. The licensee has performed a safety screening of the compensatory measures and concluded that the compensatory measures do not introduce a USQ.

For long-term resolution of the issue, the licensee has decided not to restore the plant to the original licensing basis as described in the UFSAR. The licensee has elected to revise the control room analysis with new analysis assumptions, methodology, and acceptance criteria for the 10 C.F.R. § 50.67 Alternative Source Term. This submittal will also contain new Technical Specifications for recent plant upgrades and the implementation of Generic Letter 99-02 requirements. The licensee has performed a safety screening of the final resolution of the issue and determined that it constitutes a USQ and a license amendment will have to be submitted and approved by the NRC prior to making the changes to the UFSAR. The licensee is scheduled to submit the license amendment prior to the restart of Unit 2.

**NRC REVIEW:** The NRC technical staff provided an overview of the licensee's GL 91-18 evaluation of the nonconforming condition. The staff is aware of the following compensatory measures:

1. Maintain RCS activity less than 0.35 micro-curies/gm dose equivalent I-131;
2. Maintain total containment leak rate less than 0.125 weight percent/day; and
3. Maintain total ECCS leak rate less than 0.2 gpm.

## Enclosure 2

The staff considers that the implementation of such compensatory measures is a reasonable approach to limit the post-accident control room dose to within the limits specified by GDC 19 for Unit 2. The staff also notes that the licensee considers the availability of KI for control room operators a defense-in-depth measure in the event radiological conditions within the control room exceed the guidelines of the licensee's established procedures. The performance of the NRR overview will be mentioned in NRC Inspection Report (IR)200016.

**RECOMMENDATIONS/ACTIONS:** It is recommended to the MC 0350 Panel that RAM ISSUE R.3.8 be closed. No further inspection on this issue is necessary, based on the corrective actions taken by the licensee. In addition, the NRR staff finds that the timeliness of the licensee's corrective actions (prior to restart of Unit 2) for final resolution of the issue is commensurate with the safety significance of the issue.

## Enclosure 2

### **RAM ISSUE R.3.12: Tornado Missile - Related Issue on Unit 2**

The issue deals with tornado missile vulnerabilities associated with the heating, ventilation, and air conditioning (HVAC) intake hoods located on the roof of the electrical switchgear room (I&M Condition Report P-99-13576), and tornado missile vulnerabilities associated with the fuel handling building (I&M Condition Report P-99-27193).

Consistent with the guidance contained in Generic Letter 91-18, equipment listed in the Technical Specifications is considered to be operable if it is able to perform its specified functions as defined in the current licensing basis for the facility. Therefore, in order to be operable, Technical Specification equipment that includes this as a design requirement must be protected from tornado missiles whenever a valid tornado threat exists (i.e., during tornado season). The staff's position with regard to the operability evaluations that were completed by the licensee is as follows:

- The NRR staff agrees with the licensee's operability evaluation relative to the HVAC intake hoods for Modes 1-4. The staff also agrees that compensatory measures can be taken to restore equipment operability consistent with the guidance contained in GL 91-18. The staff has reviewed the licensee's compensatory measures and find them reasonable, but recommends the resident inspector staff inspect the adequacy of the compensatory measures since they are in a better position to make an assessment.
- The licensee's evaluation did not assess whether the affected equipment that is required to be operable in Modes 5 and 6 can perform their specified functions in the event of a tornado missile strike. This would be applicable to the affected Technical Specification equipment that includes tornado missile protection as a design requirement. Although the licensee's evaluation is weak in its lack of addressing any Mode 5 and 6 vulnerabilities, the staff considers this issue to be of very low safety significance.
- The staff agrees with the licensee's operability evaluation relative to the fuel handling building. While the Technical Specification requirement associated with spent fuel pool water level could be impacted by a tornado missile, the licensee has determined that there is reasonable assurance that the spent fuel pool will continue to perform its intended safety function and therefore, should be considered operable but degraded. This is consistent with the guidance that is contained in GL 91-18, and this approach is acceptable.

## Enclosure 2

### RAM ISSUE R.3.13: High Energy Line Break

The staff has completed its assessment of the licensee's operability evaluation regarding High Energy Line Break (HELB) exclusion zones in the Chemical and Volume Control System (CVCS) letdown piping and Steam Generator Blowdown (SGBD) piping. The piping of concern is located outside the containment structure, between the containment penetration and the outboard isolation valve, and near the normal blowdown flash tanks.

In accordance with the Current Licensing Basis (CLB) for D. C. Cook, Units 1 and 2, for high energy lines, breaks must be postulated at terminal ends, and at locations where the break stress threshold is exceeded. Likewise, a single critical crack must be postulated at the most adverse location near safety-related equipment, which can be anywhere along the line. For the above listed systems, the licensee determined that they were in a degraded and nonconforming condition with the CLB. In lieu of bringing these systems into conformance with the CLB, the licensee elected to establish their operability by evaluating postulated break and crack exclusion zones in the affected piping. The licensee requested to amend the licensing basis requirements using the same operability criteria as discussed below.

To justify operability in the degraded condition, the licensee performed analyses to determine the stresses at break postulation locations. The pipe stresses were calculated based on ANSI B31.1.0, 1967, subject to stress-based break postulation threshold criteria stated in Appendix B of Standard Review Plan (SRP) Branch Technical Position (BTP) ASB 3-1 (letters of December 1972 and January 1973, from A. Giambusso, NRC, to licensees). The results of these calculations indicate that the pipe stresses at the terminal ends and other locations are below the threshold break postulation criterion; therefore, there is a low likelihood of breaks occurring in the affected piping.

To avoid postulating a single critical crack at the most adverse location near safety-related equipment, as required under the CLB, the licensee proposed the postulation of cracks based on one half of the break stress criterion. Although this is outside the CLB, the staff finds it acceptable to show operability. To mitigate the effects of potential jet impingement effects on adjacent safety-related equipment, the licensee proposed an exclusion criterion based on the results of NUREG/CR-2913 (no jet impingement effects for equipment located at a distance greater than 10 pipe diameters). This criterion has been accepted by the staff at other plants. The licensee stated that no safety-related equipment was located closer than 10 pipe diameters from the affected piping. The staff finds this acceptable.

To eliminate the postulation of a crack in a portion of the SGBD system located in the normal flash tank room, the licensee replaced a segment of existing piping with heavy wall piping and introduced piping support modifications. This lowered the pipe stresses below the crack stress threshold. The staff finds this acceptable for demonstrating the operability of this piping.

The staff has reviewed the results of the licensee's calculations, and concludes that, although the piping is nonconforming with the CLB, the licensee's operability evaluation is acceptable and provides reasonable assurance for operation in Mode 1.

## Enclosure 2

### **RAM ISSUE R.3.14: Methodology Changes to SGTR Analysis**

The staff has completed its assessment of the licensee's operability evaluation concerning the methodology used in its steam generator tube rupture (SGTR) analysis. The current SGTR analysis assumes that break flow through the ruptured steam generator tube will be stopped in 30 minutes following the event. This assumption was not supported by a thermal hydraulic analysis considering proper operator actions for accident mitigation.

To address the above described non-conservativeness in its SGTR analysis, the licensee has modified its Emergency Operating Procedures (EOPs) and used a staff-approved methodology (WCAP - 10698-P-A) to analyze a design basis SGTR event which incorporated the operator actions specified by plant EOPs at D.C. Cook. The operator action times considered in this analysis has been verified at plant simulator by different operating crews. However, a limiting single failure is not assumed in this new analysis. The licensee considers that this approach is consistent with its current licensing basis. The results of the licensee's new analysis confirms that there will be no steam generator overfill following a SGTR event, break flow will be stopped in 51 minutes, and the radiological consequence will be bounded by the current analysis.

The staff concludes that the licensee's operability evaluation for this issue is acceptable since the results of its new analysis provide reasonable assurance that it is unlikely that a SGTR event could cause steam generator overfill at D.C. Cook.

## Enclosure 2

**RAM ISSUE R.3.15:** Loss of AC and Feedwater Analyses Revision Due to Input changes to positive MTC used to meet acceptance criteria

The staff has reviewed the licensee's approach to reanalyzing the loss of normal feedwater (LONF) and loss of AC power (LOAC) transients based on the Westinghouse Nuclear Safety Advisory Letter, NSAL-98-007. This letter notified the licensee that incorporation of the pressurizer heater (which was not previously modeled) and a corrected pressurizer spray model resulted in increased pressurizer in-surge for these transients for D.C. Cook Unit 2 when the most positive moderator temperature coefficient (MTC) allowed by plant Technical Specifications (TS) was used. The current D.C. Cook TS limit the MTC to  $+0.5 \times 10^{-4} \Delta k/k/^{\circ}F$  for power levels up to 70 percent, and ramp linearly to  $0 \times 10^{-4} \Delta k/k/^{\circ}F$  at 100 percent power. In order to achieve acceptable results for Unit 2, Westinghouse used the full power TS limit of  $0 \times 10^{-4} \Delta k/k/^{\circ}F$  instead of the part power limit of  $+0.5 \times 10^{-4} \Delta k/k/^{\circ}F$  used previously in these analyses. The results confirmed that all acceptance criteria for these events continue to be met and, in particular, the pressurizer does not become water solid.

Although the revised MTC assumption is in compliance with the D.C. Cook Unit 2 TS at full power, the reduction in MTC for the full power transients represents a change in a design input value used in the current UFSAR analyses and represents a reduction in margin of safety, thereby constituting an unresolved safety question (USQ). However, the staff concludes that since this revised analysis complies with the TS limits for MTC under the assumed worst case initiating conditions for these transients, Unit 2 is considered operable but nonconforming until such time that a license amendment incorporating the revised methodology and revised UFSAR pages is reviewed and approved.



## Enclosure 2

### **RAM ISSUE R.3.16: Auxiliary Building Engineered Safety Feature Ventilation System Filtration System Bypass Damper Redundancy**

The staff reviewed the licensee's operability determination regarding the replacement of two ESF ventilation system charcoal filter bypass dampers in series with two bypass dampers in parallel. The bypass dampers are normally open and the charcoal filters are bypassed to maximize the time between charcoal replacements. On receipt of a Phase B Containment Isolation signal, the charcoal filter bypass dampers close and airflow is directed through the charcoal filters. Charcoal filter mode of operation is required in order to remove radioactive gases from the auxiliary building exhaust that may be present under accident conditions.

The licensee's original design required two dampers in series around each charcoal filter. A single failure of one bypass damper to close in a series configuration would not preclude the other bypass damper from closing and redirecting all of the air flow to the charcoal filters. Due to excessive leakage past the original dampers, the licensee replaced them during modification 12-DCP-049, Rev. 1, with improved dampers; however, the improved dampers were installed in a parallel configuration. In the parallel configuration, the failure of one damper to close would allow a bypass flow path around the charcoal filters and release air to the environment without benefit of charcoal filtration.

The licensee determined that an unreviewed safety question existed since the single failure protection of the bypass damper series configuration was lost. The licensee concluded that either a license amendment or additional modification was necessary to resolve the single failure issue, but that the system was operable, but degraded, in the interim. The operability determination was documented in Condition Report P-00-004984.

The licensee's operability determination was supported by the following:

- The operability of the ESF ventilation system as modified has been successfully established by periodic surveillance test procedures;
- The operability of the bypass dampers is verified on a staggered test basis every 31 days;
- The replacement dampers are of superior design, quality, and reliability to the original dampers;
- There have been no known failures of this type of damper in the industry;
- The failure of a bypass damper represents only a partial loss of filtration, since the roughing filters and high efficiency particulate filters are always in the flow path; and
- While a postulated bypass damper failure increases the release of radioactive fission products, the consequences are bounded by the licensee's accident analysis and are within the current licensing basis limits.

The staff reviewed the licensee's operability determination documented in Condition Report P-00-04984 and concluded that it is reasonable until final resolution of the single failure issue, based upon continued successful periodic surveillance testing, the improved design of the replacement dampers, and meeting the current licensing basis accident consequences in the case of a postulated failure of one of the bypass dampers.

## Enclosure 2

### RAM ISSUE R.3.17: Transient Mass Distribution Analysis

#### BACKGROUND

The Mechanical & Civil Engineering Branch (EMEB) has reviewed the submittals by American Electric Power Company (licensee) regarding its operability determination evaluation (ODE) of the D.C. Cook Unit 2 containment and Ice Condenser structures, containment divider barrier seal assembly, and Fan-Accumulator walls in containment (Refs. 2 and 4). EMEB was requested to review the licensee's ODE to determine if the licensee's approach to the structural issues is reasonable and if its conclusion is acceptable for restart of D.C. Cook Unit 2 until final resolution of these issues is determined. EMEB staff also participated in a meeting with the licensee on June 1, 2000, to discuss the results of its operability determination of affected structures. The Plant Systems Branch was consulted concerning the acceptability of the assumptions used in the calculations of differential pressures provided by Westinghouse Electric Company to the licensee (Ref. 3) for its use in the operability evaluation of designated structures.

#### Containment and Ice Condenser Structures (CR: P- 99-06123)

EMEB has reviewed the operability determination evaluation for Unit 2 containment and Ice Condenser structures identified in Section 2 of CR: P-99-06123, to determine if the licensee's technical approach is reasonable and if its conclusion is acceptable. The licensee provided a summary of its ODE of the affected structures.

In its operability evaluation, the licensee examined applicable UFSAR load combinations and determined that the combinations containing design basis accident (DBA) pressure loadings are governing. The licensee used as-built plant specific information in its reconstituted new calculations for Transient Mass Distribution (TMD) analysis (Ref. 3). The licensee has demonstrated that for operability evaluation of Unit 2 containment structures a load factor of 1.0 on the pressure loading was exceeded. The staff considers this evaluation reasonable and a load factor of 1.0 an acceptable threshold for operability due to the inherent conservatism in the TMD analysis. The licensee stated that the other concurrent loads (e.g., seismic) are consistent with UFSAR commitments. The licensee also stated that for concrete and steel structures evaluated in CR 99-06123, stresses are within the code-allowable stresses for the abnormal/extreme environment loading combination with a load factor of greater than 1.0 for each of the loads considered in the load combination.

The licensee has used concrete strength of 5300 psi based on extrapolated data from Unit 1 for the steam generator (SG) enclosure structure. The staff currently accepts as-built strength of 4867 psi based on 28-days concrete cylinder strength data at Unit 2. The licensee has not provided an adequate justification for as-built concrete strength greater than 4867 psi for Unit 2 containment structures. However, the current margin in the SG enclosure structure is sufficient based on as-built concrete strength of 4867 psi.

Attachment 7

## Enclosure 2

### Containment Divider Barrier Seal Assembly (CR: P-00-02184)

In CR: P-00-02184, the licensee provided a summary of its ODE of Unit 2 containment divider barrier seal assembly. The divider barrier seal assembly provides for separation of the lower compartment of containment from the upper compartment at all locations adjacent to the containment wall. The licensing basis design of the divider barrier seal assembly is qualified for an upward differential pressure of 24 psig, and 1.3 inch of differential movement due to pressure and seismic loading. During the reconstitution of calculations to substantiate the divider barrier seal assembly design, the licensee determined that, portions of the divider barrier seal assembly do not meet the licensing basis design requirements of 24 psig differential pressure and 1.3 inch of lateral movement. The licensee recalculated expected differential pressure of 15.8 psi and maximum lateral movement of 0.96 inch (between the containment and crane wall) for the qualification of divider barrier seal assembly and determined the divider barrier seal assembly to be operable.

The licensee also determined that the existing floor seal assembly was not designed or is capable of resisting a recalculated expected downward differential pressure between the ice condenser lower plenum and the fan accumulator room. However, the licensee stated that the differential pressure exists for a short duration of 200 milliseconds, and any leakage in the downward direction would not constitute a bypass of the ice condenser (Ref. 3).

### Fan-Accumulator Walls in Containment (CR: P-00-2506)

#### 9. Limiting Load Combination

In Reference 1, the licensee designates  $C = 1.5 P1 + DL + T$  as the limiting load-factored design combination, where C is the capacity; P1 is the pressure due MSLB; DL is the dead load; and T is the thermal loading associated with MSLB. The staff agrees with the licensee's hypothesis that the stresses, strains, and deformations from this loading combination will be larger than those from the other load combinations in the UFSAR. The licensee's operability criterion is  $C > 1.0 P1$ , as the effects of DL and T are very small. The operability criterion is controlling compared to LOCA pressures, or the effects of the postulated design-basis earthquake. The licensee does not meet the MSLB design-basis load combination. However, for operability determination, the staff considers the licensee's selection of the operability criterion reasonable and acceptable when taken in context with the inherent conservatism in the TMD analysis.

#### 10. Conditions of Degraded Walls

In the original construction, the top of the walls at azimuths 126° and 307° contained weak grout credited for up to 1000 psi strength. The licensee used sound grout to fill the pockets and excavations created to verify the existence of rebars and to take concrete core samples for verifying the strength of the 126° wall. The licensee asserts that the actual strength of this grout is more than 7000 psi but in the operability calculation it is conservatively assumed as 2500 psi. For the 307° wall, the licensee considered the strength of the weak grout as 1000 psi

## Enclosure 2

in the ODE calculations (Ref. 1). For the purpose of the operability calculations, the licensee considered: (1) The top of all walls to be transferring shear, but not any moment, and (2) the number of rebars considered in the shear resistance was limited only to those verified by visual examination for the 126° wall. The staff considers these actions by the licensee to account for the degraded condition of the walls reasonable and conservative.

### 11. Concrete Strength

The design concrete strength of 3500 psi is specified for the walls (Ref. 1). The 28-days strengths of concrete cylinders taken during the construction computed for 95/05 confidence are 4385 psi and 4867 psi for Unit 1 and Unit 2 respectively. These are the strength statistics based on lab-cured cylinders. The licensee also has four 28-days and 90-days compressive strength data taken from the Unit 1 containment. The average of these four tests at 28 days is 4856 psi, and at 90 days the average is 5920 psi. Based on these four tests, the licensee is establishing the strength gain due to aging of concrete as 1.22. The licensee proposed to use such relation for Unit 2 containment. The staff did not find this acceptable.

The mere fact that there is an 11 percent difference in the 28-days strengths of Units 1 and 2 indicates that the concrete in the two containments is markedly different; either in the mix proportion, use of admixtures, curing condition, or combination of these factors. This fact would suggest that the statistics of one unit cannot be applied to the other unit. Even for Unit 1, to base the strength gain ratio on the average of four tests does not appear reasonable. Also, relatively early strength gain at 28 days for Unit 2 concrete suggests that the later strength gain may not be as large as that for Unit 1.

In order to establish the 90-days concrete strength at Unit 2, the licensee increased the concrete strength at 28 days from 4867 psi to 5300 psi (i.e., 9 percent increase due to aging). Such a strength gain is not unusual for normal concrete. However, the licensee did not offer substantive basis in support of the proposed increase. Therefore, the staff does not consider the use of 5300 psi concrete reasonable at this time. The staff based its decision on operability of affected walls using 4867 psi concrete as discussed in E below.

### 12. Treatment of Impulsive Pressure Load

The licensee has used the new TMD analysis (Ref. 3), based on the as-built condition, to develop the time history of the differential pressure resulting from an MSLB, which was applied to the walls as an impulsive load. The licensee developed a generic dynamic load factor (DLF) relationship corresponding to the natural period of vibration (T) of a structure, based on the applied time-history. For all four walls, the licensee has calculated a DLF of 1.09 corresponding to the T of approximately 0.05 seconds. The licensee has also considered the dynamic increase factor (DIF) in strength of materials that could occur as a result of the rapid strain rates associated with a dynamic load, using Appendix C of ACI 349. The staff finds the use of DLF to be consistent with current industry practice. However, considering the almost static response of

## Enclosure 2

the structure to the applied differential pressure load, the use of DIF, in this case, was not adequately justified by the licensee and therefore was not accepted by the staff.

### 13. Staff's Review of the Calculations

Based on the validity of the licensee's calculations, the staff recalculated the impact of the acceptable parameters in Items C and D above, for the weakest wall at azimuth 126°. The staff found that the impact of the use of 5300 psi vs. 4867 psi in the operability calculations for the 126° wall is not significant. Eliminating the DIF does not appreciably change the load factor calculated for moment, but the load factor associated with the shear transfer calculations changes to 1.05 from the licensee calculated value of 1.21. However, increasing the grout compressive strength from 2500 psi to 3500 psi (which is reasonable for a grout showing the strength of above 7000 psi), would increase the load factor to 1.18. Thus, overall, the staff finds the licensee's operability calculations reasonable and acceptable.

### CONCLUSION

The staff has reasonable assurance that the stresses in concrete and steel structures evaluated in CR: P- 99-06123, CR: P-00-02184, and CR: P-00-02506, are within the code-allowable stresses for the abnormal/extreme environment loading combination with load factor greater than 1.0 for each of the loads considered. Based on its review of the information submitted by the licensee and the response to the staff's request for additional information, the staff concludes that the licensee's technical basis for determining operability of Unit 2 containment and Ice Condenser structures, containment divider barrier seal assembly, and Fan-Accumulator walls in containment is reasonable. This conclusion is acceptable for restart of Unit 2 of D.C. Cook.

### REFERENCES

1. AEP's submittal: Calculation No. SD-000510-003, May 29, 2000.
2. D.C. Cook Condition Report: P-00-02506, May 31, 2000.
3. Letters, Westinghouse Electric Company to AEP, AEP-00-139, dated April 27, 2000, AEP-99-261, dated August 17, 1999, and AEP-00-178, dated June 1, 2000
4. CR: P- 99-06123, and CR: P- 00-02184.