UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

August 17, 2000

MEMORANDUM FOR: Ross Landsman, Project Engineer
Division of Nuclear Materials Safety

FROM: J. E. Dyer, Regional Administrator JEDyer

SUBJECT: RESOLUTION OF DIFFERING PROFESSIONAL VIEW ON CEQ FAN ROOM WALL OPERABILITY (D. C. COOK UNIT 2 STARTUP)

Your memorandum to me dated June 6, 2000, identified your Differing Professional View (DPV) with the NRC staff decision to allow the restart of D. C. Cook, Unit 2, with a degraded, but operable CEQ fan room wall. The DPV addressed two concerns related to the operability of the containment wall. The first concern focused on the technical aspects of the operability evaluation for the wall, questioning both the conservatisms and uncertainties used to determine that the design margin of the wall was acceptable. The second concern challenged the appropriateness of applying the criteria of Generic Letter 91-18 to the degraded wall. In a memo dated June 23, 2000, I formed an Ad Hoc DPV Review Panel in accordance with NRC Management Directive 10.159.

I have reviewed the August 11, 2000, report of the Ad Hoc Differing Professional View Panel concerning the CEQ fan room wall operability and agree with the panel's rationale, conclusions, and recommendation. A copy of the panel's report is attached. The panel concluded that the actions taken by the NRC staff were appropriate from both the technical and process perspectives. The panel made a recommendation that the NRC staff address with the licensee a more definitive time frame for the final corrective actions for the degraded wall. By separate correspondence I will direct the MC 0350 panel to address this issue with the licensee to firm up a corrective action schedule.

I appreciate and commend your willingness to utilize the DPV process. Your willingness to bring your concerns to my attention in a timely manner facilitated the NRC staff deliberations before restart and contributed to the quality of the restart decision-making process. In accordance with Management Directive 10.159, a summary of the issue and its disposition will be included in the Weekly Information Report to advise interested employees of the outcome. DPVs are not normally made available to the public. However, if you would like to have your DPV case file made public, with or without the release of your name, please contact Bruce Berson.

CONTACT: Bruce Berson/ORA
630/829-9653

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Ross Landsman

This completes our review of your DPV. Should you wish, you may initiate the Differing Professional Opinion process as described in Management Directive 10.159.

Attachment: As stated

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August 11, 2000

Pub 8/12/00

MEMORANDUM TO: J. E. Dyer, Regional Administrator

FROM: Geoffrey E. Grant, Director, Division of Reactor Projects

Geoffrey E. Grant

SUBJECT: RECOMMENDATION OF AD HOC REVIEW PANEL FOR DIFFERING PROFESSIONAL VIEW: CEQ FAN ROOM WALL OPERABILITY

REFERENCES:

1. Memorandum Dyer to Grant: AD HOC REVIEW PANEL FOR DIFFERING PROFESSIONAL VIEW: CEQ FAN ROOM WALL OPERABILITY (D. C. COOK UNIT 2 STARTUP), dated June 23, 2000.

2. Memorandum Bajwa to Grobe: RESOLUTION OF DEGRADED CEQ FAN ROOM WALL, dated June 12, 1999.

3. D. C. Cook Action Request Status Report for AR A0156971, printed May 2, 2000.

4. D. C. Cook Condition Report P-99-27755 status screen page, printed April 18, 2000.

5. Summary of pour card data for CEQ walls, Calc. No. SD-000510-003, Page No. F5.

6. Westinghouse letter Rice to Hoskins: REACTOR CAVITY LOOP SUBCOMPARTMENT - PRESSURE TIME HISTORIES, dated April 27, 2000.

7. Westinghouse letter Rice to Greenlee: TMD ANALYSIS - CLARIFICATION OF 40 PERCENT DESIGN MARGIN, dated June 1, 2000.

8. Summary of May 4, 2000, D. C. Cook public meeting, dated May 17, 2000.

9. NRC Manual Chapter (MC) 9900, "Resolution of Degraded and Nonconforming Conditions," dated October 8, 1997.

In accordance with your memo of June 23, 2000, to me (Reference 1), an Ad Hoc Differing Professional View (DPV) Review Panel (Panel) was formed in accordance with NRC Management Directive (MD) 10.159 with myself as Chairman and Patrick Hiland (Region III) and Dr. Yong Kim (NRR) as members to review a DPV regarding the operability of CEQ Fan Room Walls at the D. C. Cook site. The purpose of this memorandum is to provide you with the Panel's review, conclusions, and recommendation for this DPV.

The DPV addressed two main issues related to the operability of the CEQ Fan Room Walls inside containment at D. C. Cook Unit 2. The first issue focused on the technical aspects of the walls and challenged both the conservatisms and uncertainties associated with the design margins of the walls. The second issue focused on the appropriateness of applying Generic Letter (GL) 91-18 to the degraded walls in support of unit restart. In reviewing this DPV, the Panel met on two occasions, had additional dialogue, interviewed the DPV Submitter, interviewed key members of the NRC D. C. Cook 0350 Restart Panel, and reviewed References 2-9. The primary document used was Reference 2 which contained the staff analysis/resolution of the issues the Submitter raised in the DPV and included material from the licensee June 1, 2000, presentation to the staff on the issue of the degraded walls. The issues (and sub-issues in the case of the use of GL 91-18) are discussed below.

ISSUE - Conservatisms and Uncertainties Associated with the CEQ Fan Room Walls

REVIEW

The first issue raised by the Submitter was the uncertainties due to the construction discrepancies of the CEQ Fan Room Walls at D. C. Cook Unit 2. The Submitter identified several construction discrepancies (i.e., cover and spacing of the reinforcing steel, quality of the grout and concrete, thickness differences on various pours, etc.). The Panel reviewed the results of a June 1, 2000, meeting between American Electric Power Company (licensee) and NRC to discuss this issue. The Submitter also participated in that meeting. In the meeting, the licensee acknowledged and addressed the construction discrepancies. The presentation included structural analysis results based on the degraded present structural conditions, and sought to demonstrate that the degraded walls were operable by showing a factor of safety of 1.21. The staff of NRR/DE/EMEB reviewed the analysis results, challenged some aspects of the analysis, and recalculated a factor of safety of roughly 1.05. Overall, the staff concluded that the licensee operability calculations for the walls were reasonable and acceptable.

In the Panel interview with the Submitter on June 28, 2000, he indicated that he accepts the staff calculated factor of safety of 1.05. However, he had an additional concern that the factor of safety of 1.05 would be smaller if: (1) the 28-days concrete strength of 4807 psi was used in the analysis rather than 4867 psi, and (2) 40 percent margin was included in the highest calculated differential pressure in the analysis.

Regarding the use of the concrete strength of 4867 psi, the staff indicated (Reference 2) that the licensee used the 4867 psi in the analysis based on the 95/05 confidence computation from the 28-days strengths of concrete cylinder samples taken during the construction. The 4807 psi was the lowest concrete strength among the samples.

With respect to the 40 percent margin increase, the NRC Standard Review Plan (SRP), Section 6.2.1, requires 40 percent margin to the design differential pressure for plants being reviewed for construction permits. However, the SRP allows the 40 percent margin requirement to be eliminated as long as as-built data is used in the calculations. In the June 1, 2000, meeting, the licensee informed the staff that it used as-built conditions of the structures in

the pressure calculation and the 40 percent allowance was not needed. The staff of NRR/DSSA/SPLB accepted the licensee pressure calculation.

In view of the questions surrounding these walls, the Submitter raised a general question about the confidence in other concrete structures and whether or not they were built as designed and meet their intent (extent of condition). The Panel understood that the licensee described their reviews of construction records and photographs of initial construction showing the placement of concrete reinforcement bars in the June 1, 2000, meeting. In addition, the licensee described the examination of as-built structures that were performed to assess whether the problems identified on the CEQ wall exist in other structures. After extensive discussion, the staff found that the circumstances that resulted in the condition of the CEQ walls were unique based on the provided data and construction information regarding other walls. The Panel reviewed the material presented and discussed the meeting dialogue on this issue with MC 0350 Panel members who were there.

CONCLUSION

The Panel concurs with the staff that the use of 4867 psi based on the 95/05 confidence computation is a generally accepted engineering practice and reasonable approach for determining the operability of the walls and is therefore acceptable.

The Panel concurs with the staff that there is no need for the 40 percent margin requirement in the pressure calculation per the SRP guidelines.

While clearly an area of judgement, the Panel believes enough information was presented for the MC 0350 Panel to make an informed decision on the extent of condition.

RECOMMENDATION

None

ISSUE - Appropriate Use/Application of GL 91-18

SUB-ISSUE - Adequacy of the application of GL 91-18 guidelines regarding: 1) Availability of redundant or backup equipment; 2) Compensatory measures; and 3) Conservatism and margin

REVIEW

The staff response to the above three issues states that the licensee demonstrated operability for the affected structural element, i.e., load factor is above 1.0; therefore, consideration of other factors is not necessary.

As noted in the guidance provided in MC 9900, Resolution of Degraded and Nonconforming Conditions, the above three items are included as items to consider for a "Reasonable Assurance of Safety." Additional items also listed include: safety function and events protected against; probability of needing the safety function; and PRA or IPE results. The guidelines in

MC 9900, Section 4.7, provide some insight into the NRC expectations for when a compensatory action is to be implemented. Since the licensee was not required to establish a compensatory measure to restore operability of the affected structure (load factor was agreed to be greater than 1.0), their decision to use it "as-is" for some interim basis is reasonable. This does not mean that action is not required to restore licensed design margin; rather, the operability demonstration suggests that the degree of degradation is less than for an item which requires compensatory action.

CONCLUSION

The Panel concludes that the licensee use of GL 91-18, and the staff acceptance of the licensee operability evaluations with the interim "use-as-is" disposition (i.e. delay restoration of design margin), was in accordance with existing guidelines.

SUB-ISSUE - GL 91-18 refers to the impact on core damage frequency (CDF), but containment is needed for large early release frequency (LERF)

REVIEW

The conclusion of the NRC staff, as documented for Restart Action Matrix Issue R.3.17, was that the licensee operability determination was reasonable and demonstrated the affected structure was operable. The staff response to this issue stated that since containment was operable but degraded, there was no substantive change in the probability of a large early release.

CONCLUSION

The Panel concurs with the staff position that, based on the capability of the affected structure to perform its intended function as indicated in the operability determination, there was no substantive increase in a large early release frequency.

SUB-ISSUE - Timeliness of licensee actions with regards to GL 91-18

REVIEW

The staff response to this issue described the sequence of observations and identified problems on the affected structure, which eventually led the licensee to conduct a detailed operability evaluation. References 3 and 4 document the licensee initial determination that the affected structure had "...severely degraded concrete coating and grout..." in February 1998. At the time of discovery, the noted discrepancies were believed, as documented in the associated Action Request, not to impact the structure's operability. In November 1999 the severity of the nonconformance was more defined after repair work identified that structural repair, not cosmetic, would be required. In early 2000, the licensee appears to have concentrated their efforts on a "use as-is" disposition for the affected structure. In May 2000 a public meeting was held with the licensee (Reference 8) and the NRC staff identified several pieces of technical

information that the NRC needed to perform a thorough evaluation. The Panel discussion with the NRC staff who were present at the May 2000 meeting indicated that the licensee was not prepared or they did not understand the severity of the nonconformance. On June 1, 2000, another public meeting was held with the licensee to discuss their operability determination. At that meeting, the licensee presented their corrective actions - post restart (Reference 2, Slide 29).

Manual Chapter 9900, Section 4.3, states that when degraded or nonconforming conditions are identified, "The licensee **must** [emphasis added] establish a time frame for completion of corrective action."

CONCLUSION

The licensee use of GL 91-18, and the decision to rely on the demonstrated operability determination without restoring and/or revising their Safety Analysis Report design margin prior to restart of D. C. Cook Unit 2, was reasonable. As stated in the MC, the time frame governing corrective actions begins with the discovery of the condition. At issue is the response of the licensee to a known nonconformance originally identified in 1998. The documented information presents a reasonable argument that the licensee was effectively implementing their corrective actions according to the safety significance of the issue. The original nonconformance was believed to be only "cosmetic" problems with the concrete or grout. In late 1999 the licensee corrective action programs were effective in recognizing that the problem required more than a cosmetic repair.

Considering the analysis required and the increased severity of the degraded condition discovered in 2000, the licensee decision to defer a permanent repair on the degraded structure and address the operability of the current condition was reasonable.

One issue not well documented is the time frame for the licensee to complete corrective actions. Through review of records and interviews of NRC staff present at the June 1, 2000, public meeting, it appears that the licensee did not initially present specific details regarding their time frame for completion of corrective actions. As a matter of record, the licensee deferred development of a schedule for permanent resolution until Unit 1 restart (Reference 2, Slide 29). As noted during interviews, NRC management present at the June 1, 2000, meeting emphasized the NRC expectations that corrective actions be implemented in accordance with current NRC guidance, i.e., as soon as practical commensurate with the safety significance of the deficiency, but not later than the next refueling outage for Unit 2. The acceptability of the licensee "corrective action - post restart" was partially based on verbal agreement from the licensee that adequate corrective actions would be implemented based on a schedule to be presented after Unit 2 restart. While the Panel believes this was acceptable, a more substantive commitment or presentation from the licensee prior to restart of D. C. Cook Unit 2 would have more closely aligned with the guidance of MC 9900.

Overall, the Panel believes the licensee use of the guidance in GL 91-18 to restart D. C. Cook Unit 2 was appropriate. The licensee and the NRC followed the guidance documents with some judgement used for accepting the licensee's commitment for a timeframe for permanent corrective actions.

RECOMMENDATION

The Panel recommends that the MC 0350 Panel address with the licensee the issue of the need for a definitive timeframe for final corrective action.

cc: J. McDermott, HR/OD
J. Caldwell, RIII
D. Sotiropoulos, RIII
B. Berson, RIII
P. Hiland, RIII
Y. Kim, NRR

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August 22, 2000

MEMORANDUM TO: Jack Grobe, Director
Division of Reactor Safety

FROM: for J. E. Dyer
Regional Administrator

SUBJECT: CORRECTIVE ACTIONS FOR D. C. COOK CEQ FAN ROOM DEGRADED WALL

I have reviewed the recent Ad Hoc Review Panel's report on a differing professional view associated with the D. C. Cook CEQ fan room wall. I accepted the Panel's recommendation that the licensee should develop a more definitive time frame for the final corrective actions it will take on the degraded walls. Since you chair the MC 0350 panel for D.C. Cook, please ensure that the MC 0350 panel promptly addresses this issue with the licensee to firm up a corrective action schedule and inform me of our progress on this issue.

cc: G. Grant, DRP