

December 5, 2000

MEMORANDUM TO: Donald C. Cook Nuclear Plant Manual Chapter 0350 Panel
FROM: Geoffrey E. Grant, Director, DRP */RA/*
SUBJECT: MINUTES OF INTERNAL MEETING OF THE DONALD C. COOK
NUCLEAR PLANT MANUAL CHAPTER 0350 PANEL

The Donald C. Cook Nuclear Plant Manual Chapter 0350 Panel charter was announced on April 17, 1998, and most recently revised on October 4, 2000. These internal meetings are used to discuss significant technical and performance issues, NRC regulatory approach, and inspection resources and priorities. Attached for your information are the minutes from the internal meetings of the Inspection Manual Chapter 0350 Restart Panel held on November 28 and December 1, 2000.

Docket Nos. 50-315; 50-316

Attachments: As stated

cc w/att: T. Bergman, NRR
S. Singh Bajwa, NRR
C. Craig, NRR
J. Stang, NRR
J. Thompson, NRR
J. Grobe, RIII
G. Grant, RIII
A. Vogel, RIII
M. Holmberg, RIII
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DATE	12/5/00		12/5/00		12/5/00			

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MEETING MINUTES: Internal MC 0350 Restart Panel Meeting
on the D. C. Cook Nuclear Plant

DATE: November 28 and December 1, 2000

TIME: November 28 - 2:30 p.m. (Central)
December 1 - 10:30 p.m. (Central)

ATTENDEES:	J. Lamb
S. Bajwa	J. Maynen
B. Bartlett	D. Passehl
K. Coyne	J. Stang
C. Craig	A. Vogel
G. Grant	K. Coyne
M. Holmberg	

Discussion Topics:

1. *Plant Status and Inspector Insights*

The Senior Resident Inspector provided a summary of plant activities. Unit 2 continues to operate at full power with no significant equipment problems. Unit 1 continues to make progress toward restart. The licensee is moving forward with preparations for Mode 4 (Hot Shutdown). Major activities ongoing include surveillance testing, containment cleanup, and documentation closure. In addition, the Restart Readiness Assessment Team Leader updated the Panel on the status of the ongoing inspection, including a summary of findings, and observations.

2. *Discuss Restart Action Matrix (RAM)*

The Panel reviewed and discussed the status of items listed on the Unit 1 RAM. For each RAM item, inspectors or NRR staff members presented to the panel their assessment of associated issues and made recommendations to the panel. The Panel approved closure of the following Unit 1 RAM Items on November 28, 2000:

- Item 2.3, Evaluate Licensee Corrective Actions for Containment Internal Structural Walls
- Item 8.1, Reconstitution of Assumptions and Methodology for Transient Mass Distribution (TMD) Sub-compartment Analysis and Containment Sub-compartment Structural Issues

Closure for RAM items 2.3 and 8.1 is documented in Attachment 1, Memorandum from J.F. Stang to G.E. Grant, "Donald C. Cook Nuclear Plant, Unit 1 - Closeout of Restart Action Matrix Issue 2.3/8.1 Dealing with Generic Letter 91-18 Operability Evaluations (TAC Nos. MB0286 and MB0287)"

- Item C.4.e, Adequacy of Surveillance Tests/Test Program
- Item C.4.f, Significant Hardware Issues Resolved (i.e., equipment with poor material condition, equipment aging, modifications)

- Item C.4.g, Adequacy of the Power Ascension Testing Program
- Item C.4.i, Maintenance Backlog Managed and Impact on Operation Assessed

Closure documentation for RAM items C.4.e, C.4.f, C.4.g, and C.4.i will be provided in NRC Inspection Report 50-315/2000023 - Unit 1 Restart Readiness Team Inspection.
- Item C.6.e.1, Appropriate state and local officials, and FEMA.

The Region III State Liaison Officer contacted local officials, FEMA Region V, and the State of Michigan on November 15, 2000. All entities were briefed on the emergent restart of D.C. Cook Unit 1, and remaining NRC inspection activities. No concerns or issues were identified.
- Item C.5.b, Applicable exemptions have been granted.
- Item C.5.c., Applicable reliefs have been granted.
- Item C.5.d, Imposed orders have been modified or rescinded.
- Item C.5.h, 10 CFR 2.206 Petitions have been appropriately addressed.
- Item C.6.e.3, Inform Stakeholders.

Closure of RAM items C.5.a, C.5.b, C.5.c, C.5.d, C.5.h, and C.6.e.3 is documented in Attachment 2, Memorandum from J.F. Stang to G.E. Grant, "Donald C. Cook Nuclear Plant, Unit 1 - Closeout of RAM Issues C.5.a, C.5.b, C.5.c, C.5.d, C.5.h And C.6.e.3"

The Panel approved closure of the following Unit 1 RAM Items on December 1, 2000:

- Item 3.1, Evaluate Modifications Completed to Resolve Operability of the Unit 1 MOVs

Closure documentation for this RAM item will be provided in NRC Inspection Report 50-315/316/2000021 - Biennial Permanent Mods & Annual 50.59 Inspection.
- Item 8.9, Technical Specification Change Request Valve Position for Automatic Valves in the Auxiliary Feedwater System

Closure documentation for this RAM item is provided in License Amendment 250 (U1) and 231 (U2) dated November 30, 2000.
- Item C.3.3.d, Effectiveness of Restart Simulator/Required Training Necessary to Re-familiarize Personnel with Operating.
- Item C.4.a, Operability of Technical Specification systems, specifically those with identified operational, design, and maintenance issues.

- Item C.4.b, Operability of required secondary and support systems.
- Item C.4.c, Results of pre-start up testing.
- Item C.4.d, Adequacy of system lineups.

Closure documentation for RAM items C.3.3.d, C.4.a, C.4.b, C.4.c, and C.4.d will be provided in NRC Inspection Report 50-315/2000023 - Unit 1 Restart Readiness Team Inspection.

- Item C.5.a, Applicable license amendments have been issued.

Closure of RAM item C.5.a, was documented in a memorandum from John F. Stang to Geoffrey E. Grant, MC 0350 Panel Chairman dated December 1, 2000 (Attachment 2).

In addition, on November 31 and December 1, the Panel discussed Items C.3.3.e, "Assessment of plant staff performance during restart. Sustained control room observations by NRC personnel", C.4.h, "Effectiveness of the plant maintenance program", and Item C.4.j, "Adequacy of Plant Housekeeping and Equipment Storage". These items will be further discussed during the next internal Panel meeting.

3. *Discuss Deferred Modification Regarding Emergency Diesel Generator Fuel Oil Lines*

On November 31 and December 1, the Panel discussed a licensee modification regarding replacement of emergency diesel generator fuel oil lines. The Panel determined that the recently revised operability evaluation concerning this issue adequately addressed the condition of the fuel lines and future emergency diesel generator operation.

4. *Discuss Auxiliary Feedwater Valve Surveillance Testing*

On November 31 and December 1, the Panel discussed testing of the auxiliary feedwater discharge valves after entry into Mode 3. After additional discussions between inspectors and the licensee, the panel determined that related calculations and procedures need to be reviewed. In addition, the licensee planned to submit a Code relief request to address the testing methodology.

5. *Discussion of status of E-mail to All Inspectors Involved with Unit 1 Restart to Ensure Any Restart Issues Have Been Sufficiently Resolved*

Messrs. Vogel and Stang reported that no issues or concerns have been identified in response to the E-mails which were sent to NRC personnel involved with D.C. Cook Unit 1 restart inspections.

6. *Discuss/Update Milestones and Commitments.*

The Panel discussed important upcoming meetings and deadlines.

7. *Other.*

The latest Restart Action Matrix is provided as Attachment 3.

November 28, 2000

MEMORANDUM TO: Geoffrey E. Grant, Director
Division of Reactor Safety
Region III

FROM: John F. Stang, Senior Project Manager, Section 1 */RA/*
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 - CLOSEOUT OF
RESTART ACTION MATRIX ISSUE 2.3/8.1 DEALING WITH GENERIC
LETTER 91-18 OPERABILITY EVALUATIONS (TAC NOS. MB0286 and
MB0287)

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 2.3/8.1,

RAM ISSUE 2.3/8.1: Reconstitution of Assumptions and Methodology for Transient Mass Distribution (TMD) for Containment Structural Issues.

As discussed in the attachment, the NRR staff finds that the licensee's modifications, calculations, and technical basis for determining operability 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 Manual Chapter (MC) 0350 Restart Panel closure of the above RAM issue 2.3/8.1 based on the attached documentation.

This concludes our efforts under TAC Nos. MB0286 and MB0287.

Docket No. 50-315

Attachment: NRR Safety Evaluation

OFFICE OF NUCLEAR REACTOR REGULATION
SAFETY ASSESSMENT OF INDIANA MICHIGAN POWER COMPANY'S
OPERABILITY EVALUATIONS OF CONTAINMENT AND ICE CONDENSER STRUCTURES,
AND FAN-ACCUMULATOR WALLS IN CONTAINMENT FOR D.C. COOK UNIT 1
(TAC NOS. MB0286 AND MB0287)

RAM ISSUE 2.3/8.1: Reconstitution of Assumptions and Methodology for Transient Mass Distribution (TMD) for Containment Structural Issues.

1.0 INTRODUCTION

During the restart effort of Unit 2, the licensee performed a Calculation Assessment. The Calculation Assessment Report (SA-1999-011-NED) determined that certain containment structural calculations could not be located and other calculations did not meet the current licensee standards for technical and/or administrative attributes. The licensee performed a revision to the Westinghouse Transient Mass Distribution (TMD) analysis; this analysis resulted in an increase in the predicted pressure loading on some structural components. Since the TMD analysis load changes impact a variety of containment structures, and this was determined to impact the Unit 2 containment structures, an extent of condition evaluation was performed by the licensee for Unit 1 containment. The licensee decided that two operability determination evaluations (ODEs) of the Unit 1 containment structures needed to be completed to take into account the aggregate effects of the revised TMD analysis.

This evaluation by the Office of Nuclear Reactor Regulation (NRR) audited the licensee's ODEs pursuant to Generic Letter 91-18. This evaluation is broken into four sections: Background, Licensee's Corrective Actions, Nuclear Regulatory Commission (NRC) Review and Conclusions.

2.0 BACKGROUND

The containment is a reinforced concrete structure consisting of a vertical cylinder, hemispherical dome and a flat base. The interior is divided into three volumes; a lower volume which houses the reactor and reactor coolant system (RCS), an intermediate volume housing the energy absorbing ice bed in which steam is condensed, and an upper volume which accommodates the air displaced from the other two volumes during a loss-of-coolant accident (LOCA). The condensation of steam in the ice bed limits the containment pressure to values substantially below those for a comparable dry-type containment under the same conditions. The containment vessel, including all its penetrations, is a low leakage steel shell designed to contain the radioactive material that may be released from the reactor core following a design

basis LOCA. Additionally, the containment and shield building provide shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment is divided into three main compartments. These are the following: the lower compartment, the upper compartment, and the ice condenser compartment. The lower compartment encloses the RCS and associated auxiliary systems equipment. The upper compartment contains the refueling cavity, refueling equipment and polar crane used during refueling and maintenance operations. The upper and lower compartments are separated by a divider barrier. The ice condenser, which contains borated ice provided to absorb the LOCA energy, is in the form of an enclosed and refrigerated annular compartment, located circumferentially between the crane wall and the outer wall of the containment and extends from below to above the operating deck.

The lower compartment is divided into a number of subcompartments formed by equipment and internal structures. The containment pressure responses within these subcompartments were analyzed by the licensee using the TMD computer code developed by Westinghouse. The code provides a means of computing pressures, temperatures, heat transfer rates, and mass transfer rates as a function of time and location throughout the containment.

During the restart effort for Unit 2, the licensee performed a Calculation Assessment. The Calculation Assessment Report (SA-1999-011-NED) determined that certain containment structural calculations could not be located and other calculations did not meet the current licensee standards for technical and/or administrative attributes. The licensee performed a revision to the Westinghouse TMD analysis; this analysis resulted in an increase in the predicted pressure loading on some structural components.

On June 28, 2000, the licensee submitted Licensee Event Report (LER) 316/2000-003-00, "Containment Internal Concrete Structures Do Not Meet Design Load Margins." The LER contained two commitments:

8. A review of containment internal structures will be performed prior to Unit 1 startup to determine the extent of condition, repairs to structural elements will be made where applicable, and critical calculations will be reconstituted or evaluations performed to document operability of the Unit 1 structures.
9. The final course and schedule for long-term corrective and preventive actions to restore and maintain the design pressure load factors for the internal containment concrete structural elements in both units will be determined prior to Unit 1 startup.

Prior to Unit 2 restart, repairs of the physical deficiencies in certain Unit 2 sub-compartment walls were completed. In addition, the licensee completed two operability evaluations which addressed the use of the revised TMD analyses results, bounding evaluations and calculations, and where applicable, the design pressure load factor margins for specific containment structures. The Mechanical and Civil Engineering Branch (EMEB) reviewed the ODEs for

Unit 2. These Unit 2 ODEs were closed out in a memorandum from S. Black to J. Grobe, dated June 9, 2000, (Accession # ML003722259).

Since the TMD analysis load changes impact a variety of containment structures, and this was determined to impact the Unit 2 containment structures, an extent of condition evaluation was performed by the licensee for Unit 1 containment. The licensee decided that two ODEs of the Unit 1 containment structures needed to be completed to take into account the aggregate effects of the revised TMD analysis. The two ODEs for D. C. Cook Unit 1, consisted of the following: (1) containment and Ice Condenser structures, and (2) Fan-Accumulator walls in containment (References 1 and 2).

3.0 LICENSEE'S CORRECTIVE ACTIONS

3.1 Short Term

The licensee has been taking a series of comprehensive iterative actions to address its findings in containment structures. The licensee is revising the TMD analysis as well as performing bounding evaluations and refined analyses. The licensee performed two ODEs for the containment structures. These two ODEs are similar to the Unit 2 ODEs. The licensee completed calculations for the ice condenser floor slab and columns, which the staff reviewed in great detail. Any required physical work for Unit 1 was scheduled to be completed before Unit 1 enters Mode 4.

3.2 Long Term

In a letter dated June 12, 2000, the staff summarized the June 1, 2000, public meeting regarding the containment subcompartment walls. In the meeting, the licensee stated that the final resolution and schedule for both Unit 1 and Unit 2 containment wall issues would be completed prior to restart of D. C. Cook, Unit 1. The NRC staff reinforced expectations, as stated in Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," that the corrective actions to remedy the deficiencies in the walls be undertaken as soon as practical commensurate with the safety significance of the deficiency, but not later than the next refueling outage for Unit 2.

In a letter dated October 15, 2000, the licensee stated that they anticipate that confirmation of the TMD analyses, bounding evaluations, and the refined analyses will confirm that the containment structures meet their design basis requirements. If the containment structures do not meet their design basis requirements, physical plant modifications or license amendments will be pursued by the licensee. The licensee plans to complete the long-term actions by May 15, 2001, except for validating Unit 2 physical parameters that are inaccessible until the next scheduled Unit 2 refueling outage. The licensee made the following commitments in the letter dated October 15, 2000:

- By May 15, 2001, the licensee will complete calculations and evaluations to demonstrate that Unit 1 containment structures meet their design basis requirements.

- By May 15, 2001, the licensee will complete calculations and evaluations to demonstrate that Unit 2 containment structures meet their design basis requirements, subject to validation of design inputs.
- Unit 2 design inputs will be validated during the next scheduled Unit 2 refueling outage.
- By May 15, 2001, physical plant modifications or licensing actions, if required, will be identified.

4.0 NRC REVIEW

The NRR staff has reviewed the ODEs regarding the D. C. Cook, Unit 1 containment structures. The NRR staff was requested by the Manual Chapter (MC) 0350 panel to review the licensee's ODEs 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 1, until final resolution of these issues is determined by May 15, 2001. The NRR staff conducted an audit of the licensee's calculations that supported the ODEs between October 16, 2000, and November 16, 2000, at the Westinghouse liaison office in Rockville, Maryland.

4.1 Identified Containment Structural Issues

The three containment structural issues were addressed by the licensee in CR 0029904, CR 00264095, and a letter dated October 15, 2000. Any required physical work for Unit 1 was scheduled to be completed before Unit 1 enters into Mode 4.

1. The following structures were evaluated in CR 00299044:
 - Containment shell.
 - Crane wall.
 - Steam Generator enclosures.
 - Pressurizer enclosure.
 - Operating deck.
 - Primary shield wall.
 - Missile shield cover over the reactor cavity.
 - Bulkhead between the reactor cavity and the refueling canal.
 - Lower reactor cavity.
 - Slab between the lower reactor cavity and the loop compartment.
 - Ice Condenser (IC) support slab at elevation 640'.
 - Fan-Accumulator room slab at elevations 612' (including steel beams and their connections).
 - Steam generator supports.
 - Support columns for IC slab at elevation 640' and slab at 612' including their anchorage.

2. Lower containment subcompartment walls also called Fan-Accumulator Room walls were evaluated in CR 00264095.
 - Long-term corrective actions were addressed in the licensee's letter dated October 15, 2000.

4.2 NRR Staff Review

4.2.A.1 Containment Structures other than IC Structures and Fan/Accumulator Walls

The licensee stated that the ODE (Ref. 3) of Unit 2 containment structures other than IC support system and Fan/Accumulator(F/A) Walls is applicable to the corresponding Unit 1 structures, because these structures are similar (almost identical) to those in Unit 2. The NRR staff verified the above statement of the licensee to be true by comparing the structural details contained in the licensee's ODEs of both Unit 1 and Unit 2 structures.

4.2.A.2 Containment and Ice Condenser Structures (CR: 00299044)

During the audit conducted between October 16, 2000, and November 16, 2000, the NRR staff reviewed the design basis calculations for the IC Support system that were provided by the licensee. The licensee's use of the design basis calculations was consistent with the licensee's plan discussed at the September 27, 2000, public meeting. The NRR staff's review revealed that the licensee's calculations did not fully conform with its design basis at this time as certain important parameters, such as the TMD analysis, have not been finalized by the licensee. Furthermore, the NRR staff disagreed with the licensee's use of increased concrete strengths based on 90-day strength and dynamic increase factors (DIFs), as discussed in the NRR staff's assessment of ODE for Unit 2 (Ref. 3). Subsequently, the licensee performed an ODE for the IC support system without using design basis calculations.

In its operability evaluation for Unit 1, the licensee examined applicable Updated Final Safety Analysis Report (UFSAR) load combinations and determined that the combinations containing design basis accident (DBA) pressure loadings are governing. The pressure load factor is the ratio of the pressure load to the maximum rated pressure load. The licensee does not fully conform with its UFSAR design-basis pressure load factor. However, the NRR staff considers a load factor of 1.0 an acceptable threshold for operability due to the inherent conservatism in the TMD analysis (Ref. 3). The licensee has demonstrated that, for operability evaluation of Unit 1 containment structures, a load factor of 1.0 on the pressure loading was exceeded. The licensee stated that the other concurrent loads (e.g., seismic) are consistent with UFSAR commitments. The licensee has shown that, for concrete and steel structures, 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 also used concrete strength of 5220 psi based on 90-day strength, but the NRR staff currently accepts as-built strength of 4424 psi based on 28-days concrete cylinder strength data. Based upon information provided by the licensee, the NRR staff determined that the licensee had not provided adequate justification for the use of 5220 psi based on the 90-day concrete strength. Using the 28-days strength and without using the dynamic increase factor, the NRR staff verified during the audit that the safety margin for the IC support slab is about 1.07 which is acceptable for the operability of Unit 1.

4.2.B Fan/Accumulator (F/A) Walls in Containment (CR: 00264095)

4.2.B.1 Limiting Load Combination

In Reference 2, the licensee designates $C = 1.5 P1$ as the limiting load-factored design combination, where C is the capacity and $P1$ is the pressure due to main steamline break (MSLB). The licensee's operability criterion is $C > 1.0 P1$, as the effects of dead load (DL) and thermal loading (T) associated with MSLB 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 fully conform with the MSLB design-basis load combination. However, for operability determination, the NRR staff considers the licensee's selection of the criterion, (i.e. $C \geq 1.0P1$), reasonable and acceptable when taken in context with the inherent conservatism in the TMD analysis (Ref. 3).

4.2.B.2 Conditions of Degraded Walls

The licensee performed a walkdown (Ref. 2), and identified localized weaker concrete/grout near elevation 638'-0" at the top of the wall at azimuth 307°. Similarly, in several other locations of the F/A walls, discrepancies in concrete cover and spacing of rebars were observed indicating non-conformance with the design-basis requirements. Because of such discrepancies, the licensee conservatively assumed that the connection of the wall at 307° to the slab above is free in its operability calculations, even though the localized weak area in the wall at 307° azimuth was excavated and regouted with high strength grout (Ref. 2). The top joints for the other three F/A walls (at 54°, 126°, and 234° azimuth) are conservatively considered pinned in the licensee's calculations, since these walls are built monolithic with the slab at elevation 638'-0" (Ref. 2). The NRR staff considers the licensee's approximations to account for the degraded condition of the walls reasonable and conservative for the operability of Unit 1.

4.2.B.3 Concrete Strength

The licensee evaluated the adequacy of F/A walls using the 90-day concrete strength of 5262 psi, based on the concrete pour data. The licensee is considering an UFSAR change to document the use of the 90-day test results in determining the design compressive strength. But, the NRR staff does not consider the use of 5262 psi concrete reasonable at this time. However, the NRR staff evaluated the operability of the affected walls using the 28-day concrete strength of 4424 psi concrete and determined that this satisfies the criteria of $C \geq 1.0P1$. This is similar to the approach taken for Unit 2 (Ref. 3).

4.2.B.4 Treatment of Impulsive Pressure Load

The licensee has used the new TMD analysis, 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. The licensee has calculated a DLF of 1.04 for the walls at azimuths 54 and 126 degrees and 1.05 for the walls at azimuths 234 and 307 degrees corresponding to the T of approximately 0.04 seconds for all four walls (Ref. 2). The licensee has also considered the DIF in strength of the materials that could occur as a result of the rapid strain rates associated with a dynamic load, using Appendix C of ACI 349. The NRR staff finds the use of DLF to be consistent with current industry practice. However, considering the almost static response of 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 NRR staff for the ODE of Unit 1, as was the case of the ODE for D. C. Cook Unit 2 (Ref. 3).

4.2.B.5 NRR Staff's Review of the Calculations

Based on the data given in the licensee's operability evaluation calculations, the NRR staff reevaluated, during the audit, the impact of the acceptable parameters in items 4.2.B.3 and 4.2.B.4 above, for the weakest wall at azimuth 126°. The NRR staff found that the impact of the use of 5262 psi vs. 4424 psi concrete strength in the operability calculations for the 126° wall is not significant. Eliminating the DIF does not appreciably change the load factor used for calculating the moment, but the load factor associated with the shear transfer calculations changes to 1.09 from the licensee-calculated value of 1.23 (Ref. 2). Although the NRR staff took exception to the licensee's assumptions regarding concrete strength and the use of the DIF, the NRR staff determined that the

Unit 1 containment walls met the operability criteria of $C \geq 1.0P1$.

5.0 CONCLUSION

The NRR staff has reasonable assurance that the stresses in concrete and steel structures evaluated in CR: 00299044, and CR: 00264095 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 provided by the licensee during the audit conducted from October 16, 2000, through November 16, 2000, the NRR staff concludes that the licensee's modifications, calculations, and technical basis for determining operability provide reasonable assurance that the degraded or nonconforming conditions will not prevent the Unit 1 containment and IC structures and F/A walls in containment from performing their intended functions. Therefore, NRR recommends to the MC 0350 Restart Panel closure of the RAM issue 2.3/8.1.

6.0 REFERENCES

1. D. C. Cook Unit 1 Condition Report, CR: 00299044 for IC Structures.
2. D. C. Cook Unit 1 Condition Report, CR: 00264095 for Unit 1 F/A Walls.
3. Memorandum, June 9, 2000, from Kamal Manoly to Claudia Craig, Subject: "Safety Assessment of Operability Evaluation of D. C. Cook Unit 2 Containment and Ice Condenser Structures, and Containment Divider Barrier Seal Assembly."

Principal Contributor: R. Pichumani, EMEB/DE, 415-2734

Date: November 28, 2000

December 4, 2000

MEMORANDUM TO: Geoffrey E. Grant, Director
Division of Reactor Safety
Region III

FROM: John F. Stang, Senior Project Manager, Section 1 */RA/*
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 - CLOSEOUT OF RAM
ISSUES C.5.a, C.5.b, C.5.c, C.5.d, C.5.h AND C.6.e.3

The Office of Nuclear Reactor Regulation (NRR) staff has completed evaluation of the subject restart action matrix (RAM) issues. NRR recommends to the Manual Chapter 0350 restart panel closure of all the subject RAM issues. The details of each item is described below.

RAM ISSUE C.5.a: Applicable license amendments have been issued.

ISSUE: The licensee submitted five license amendments that required review and approval prior to Unit 1 restart. The NRR staff has completed the review of all five of the license amendments. All amendments have been issued. The last amendment (RAM ITEM 8.9) was issued November 30, 2000.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.a is recommended to the 0350 panel for closure.

RAM ISSUE C.5.b: Applicable exemptions have been granted.

ISSUE: The licensee did not submit any exemptions that required review and approval prior to Unit 1 restart.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.b is recommended to the 0350 panel for closure.

RAM ISSUE C.5.c: Applicable reliefs have been granted.

ISSUE: The licensee did not submit any reliefs that required review and approval prior to Unit 1 restart.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.c is recommended to the 0350 panel for closure.

RAM ISSUE C.5.d: Imposed orders have been modified or rescinded.

ISSUE: The licensee requested the order dealing with 0737 issue post accident hydrogen monitoring be modified for Units 1 and 2. NRR issued the modification to the order on February 4, 2000.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.d is recommended to the 0350 panel for closure.

RAM ISSUE C.5.h: 10 CFR 2.206 Petitions have been appropriately addressed.

ISSUE: On October 9, 1997, the Union of Concerned Scientists (UCS) submitted a Petition pursuant to 10 CFR 2.206 requesting that the operating license for Donald C. Cook Nuclear Plant, Units 1 and 2, be modified, revoked, or suspended until there is reasonable assurance that plant systems are in conformance with design and licensing bases requirements. The Petition was amended on January 12, 1998. The Director of NRR issued a final decision concerning the Petition on February 11, 1999. No additional petitions have been filed as of November 27, 2000.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.h is recommended to the 0350 panel for closure.

RAM ISSUE C.6.e.3: Appropriate state and local officials-Inform Stakeholders (UCS)

ISSUE: The UCS (Dave Lochbaum) was contacted by phone on November 28, 2000, to discuss any concerns he had over the restart of Unit 1. Mr. Lochbaum did not raise any concerns dealing the restart of Unit 1.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.6.e.3 concerning informing the UCS of Unit 1 restarting is recommended to the 0350 panel for closure.

ISSUE: The licensee requested the order dealing with 0737 issue post accident hydrogen monitoring be modified for Units 1 and 2. NRR issued the modification to the order on February 4, 2000.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.d is recommended to the 0350 panel for closure.

RAM ISSUE C.5.h: 10 CFR 2.206 Petitions have been appropriately addressed.

ISSUE: On October 9, 1997, the Union of Concerned Scientists (UCS) submitted a Petition pursuant to 10 CFR 2.206 requesting that the operating license for Donald C. Cook Nuclear Plant, Units 1 and 2, be modified, revoked, or suspended until there is reasonable assurance that plant systems are in conformance with design and licensing bases requirements. The Petition was amended on January 12, 1998. The Director of NRR issued a final decision concerning the Petition on February 11, 1999. No additional petitions have been filed as of November 27, 2000.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.5.h is recommended to the 0350 panel for closure.

**RAM ISSUE C.6.e.3: Appropriate state and local officials-Inform Stakeholders
(UCS)**

ISSUE: The UCS (Dave Lochbaum) was contacted by phone on November 28, 2000, to discuss any concerns he had over the restart of Unit 1. Mr. Lochbaum did not raise any concerns dealing the restart of Unit 1.

RECOMMENDATIONS: Based on the NRR staff's actions RAM ISSUE C.6.e.3 concerning informing the UCS of Unit 1 restarting is recommended to the 0350 panel for closure.

Attachment 3

D. C. Cook Restart Action Matrix

Unit 1

December 1, 2000

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
Inspection Report References							
Notes: ECD Estimated Completion Date (Present to IMC 0350 Panel) NRR NRC Office of Nuclear Reactor Regulation RRATI Restart Readiness Assessment Team Inspection SER Safety Evaluation Report SRI Senior Resident Inspector UCS Union of Concerned Scientists IR 2000021 - Biennial Permanent Mods & Annual 50.59 Insp 11/06/00 to 11/17/00 IR 2000022 - Resident Inspector Report 10/11/00 to 11/11/00 IR 2000023 - Unit 1 Restart Readiness Assessment Team Inspection 11/27/00 to 12/01/00 IR 2000025 - Resident Inspector Report 11/12/00 to 12/31/00							
Restart Issues							
1. Ice Condenser Operability							
1.1	Unit 1 ice condenser restoration - Observe ice condenser ice load & surveillance testing	SRI	IP 71111.22 (Surveillance Testing)	LER 315/2000-001-00, Stress Loads for the Ice Condenser Basket Assembly Greater Than Allowed by Safety Analysis Report IR 99026		11/06/00	Closed IR 2000022 (Pending)
2. Containment Operability							
2.1	Evaluate modifications to the Unit 1 recirculation sump to address previous deficiencies with inadequate inventory, dead ended compartments and sump venting.	Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	IR 99029	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)
2.2	Confirm removal of fibrous material in the Unit 1 Containment that could clog the recirculation sump.	SRI	71111.20 (Refueling and Outage Activities)	IR 2000016	IR 2000023 (11/27/00 to 12/01/00)	11/21/00	Closed IR 2000023 (Pending)

Attachment 3

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
2.3	Evaluate Licensee Corrective Actions for Containment Internal Structural Walls	SRI NRR	71111.20 (Refueling and Outage Activities)	LER 316/2000-003-00, Containment Internal Concrete Structures Do Not Meet Design Load Margins 0350 Mtg. Minutes dtd. 06/12/00	IR 2000023 (11/27/00 to 12/01/00) Panel Internal Meeting Minutes	11/21/00 (SRI) 11/28/00 (NRR)	Closed IR 2000023 (Pending)
3. Valve Operability							
3.1	Evaluate modifications completed to resolve operability of the Unit 1 MOVs	Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	LER 315/1999-031-00, Interim - Valves Required to Operate Post-Accident Could Fail to Open Due to Pressure Locking/Thermal Binding IR 2000002	IR 2000021 (11/06/00 to 11/17/00)	11/28/00	Closed IR 2000021 (Pending)
3.2	Evaluate Modifications Completed to Address Unit 1 Compressed Air System Operability	Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	IR 99029	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)
4.. Auxiliary Feedwater Operability							
4.1	Evaluate modifications completed to resolve operability of the AFW system, associated with postulated high energy line breaks.	Biennial Permanent Mods & Annual 50.59 Insp)	71111.17 (Permanent Plant Modifications)	LER 315/1999-026-00, High Energy Line Break Programmatic Inadequacies Result in Unanalyzed Conditions IR 2000007	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)
5. Electrical System Operability							
5.1	Evaluate modifications completed to resolve the Unit 1 electrical system fuse and breaker coordination.	Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	IR 2000007	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)

Attachment 3

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
6. Emergency Core Cooling System Operability							
6.1	Evaluate setpoint changes for the Unit 1 RWST Level to account for measurement error and instrument uncertainties	Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	IR 2000007	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)
7. Licensing Basis Control Program							
7.1	Evaluate licensing basis program controls for safety reviews in accordance with 10 CFR 50.59.	Biennial Permanent Mods & Annual 50.59 Insp	71111.02 (Evaluation of Changes, Tests, or Experiments)	IR 99023	IR 2000021 (11/06/00 to 11/17/00)	11/21/00	Closed IR 2000021 (Pending)
8. Licensing Issues, Amendments, Unreviewed Safety Questions							
8.1	Reconstitution of Assumptions and Methodology for Transient Mass Distribution (TMD) Sub-compartment Analysis and Containment Sub-compartment Structural Issues	NRR	N/A			11/28/00	Closed 0350 Mtg. 11/28/00
8.2	Tornado Missile Licensing Bases Change - Use of approved PRA Techniques	NRR	N/A		License Amendment 247 (U1) 228 (U2)	11/21/00	Closed 0350 Mtg. 11/21/00
8.3	Pressurizer Heater Surveillance Change TS 4.4.2	NRR	N/A		License Amendment 246 (U1) 227 (U2)	10/20/00	Closed 0350 Mtg. 10/24/00
8.4	NRC Review of Leak Before Break Methodology for the Pressurizer Surge Line	NRR	N/A		11/08/00 SER Issued	11/14/00	Closed 0350 Mtg. 11/14/00
8.5	ILRT TS Change and Exemption	NRR	N/A		License Amendment 248 (U1) 229 (U2)	11/21/00	Closed 0350 Mtg. 11/21/00
8.6	QAPD Cad-Weld Commitment	NRR	N/A		11/07/00 SER Issued	11/14/00	Closed 0350 Mtg. 11/14/00
8.7	USQ on Methodology Changes (modeling of operator actions and use of actual tube flows) to Tube Rupture Analysis. (SG Overfill)	NRR	N/A		IR 2000023 (11/27/00 to 12/01/00)	11/21/00	Closed IR 2000023 (Pending)
8.8	USQ on HELB - Licensing Basis Change Request for 10D on Plume and SRP, MEB 3-1 exclusion areas. Tac no. MA 8893/94	NRR	N/A		License Amendment 249 (U1) 230 (U2)	11/21/00	Closed 0350 Mtg. 11/21/00
8.9	Technical Specification Change Request Valve Position for Automatic	NRR	N/A		License Amendment	11/29/00	Closed 0350 Mtg.

Attachment 3

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
	Valves in the Auxiliary Feedwater System						12/01/00
Guidelines for Restart Approval							
C.3.3	Operator Issues						
C.3.3.d	Effectiveness of restart simulator/required training necessary to re-familiarize personnel with operating conditions.	SRI	71111.11 (Licensed Operator Requalification)		IR 2000023 (11/27/00 to 12/01/00)	11/28/00	Closed IR 2000023 (Pending)
C.3.3.e	Assessment of plant staff performance during restart. Sustained control room observations by NRC personnel	RRATI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	12/05/00	Open
C.4	Assessment of Physical Readiness of the Plant						
C.4.a	Operability of Technical Specification systems, specifically those with identified operational, design, and maintenance issues.	SRI RRATI	71111.15 (Operability Evaluations)		IR 2000023 (11/27/00 to 12/01/00)	12/01/00	Closed IR 2000023 (Pending)
C.4.b	Operability of required secondary and support systems.	SRI RRATI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	12/01/00	Closed IR 2000023 (Pending)
C.4.c	Results of pre-startup testing.	SRI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	12/01/00	Closed IR 2000023 (Pending)
C.4.d	Adequacy of system lineups.	RRATI SRI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	12/01/00	Closed IR 2000023 (Pending)
C.4.e	Adequacy of surveillance tests/test program.	SRI	IP 71111.22 (Surveillance Testing)	LER 50-315/99003-00, Control Room pressurization Surveillance Test Does Not Test System In Normal Operating Condition	IR 2000023 (11/27/00 to 12/01/00)	12/01/00	Closed IR 2000023 (Pending)

Attachment 3

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
C.4.f	Significant hardware issues resolved (i.e., equipment with poor material condition, equipment aging, modifications).	SRI Biennial Permanent Mods & Annual 50.59 Insp	71111.17 (Permanent Plant Modifications)	LER 50-315/99011-01, Air System for Emergency Diesel Generators May Not Support Long Term Operability Due to Original Design Error	IR 2000023 (11/27/00 to 12/01/00)	11/28/00	Closed IR 2000023 (Pending)
C.4.g	Adequacy of the power ascension testing program.	SRI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	11/28/00	Closed IR 2000023 (Pending)
C.4.h	Effectiveness of the plant maintenance program.	SRI	71111.12 (Maintenance Rule Implementation)		IR 2000023 (11/27/00 to 12/01/00)	12/05/00	Open
C.4.i	Maintenance backlog managed and impact on operation assessed.	SRI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	11/28/00	Closed IR 2000023 (Pending)
C.4.j	Adequacy of plant housekeeping and equipment storage.	SRI	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	12/05/00	Open
C.5	Assessment of Compliance with Regulatory Requirements						
C.5.a	Applicable licensee amendments have been issued.	NRR	IMC 0350		Memo from NRR to IMC 0350 Panel	12/01/00	Closed 0350 Mtg. 12/01/00
C.5.b	Applicable exemptions have been granted.	NRR	IMC 0350		Memo from NRR to IMC 0350 Panel	12/01/00	Closed 0350 Mtg. 11/28/00
C.5.c	Applicable reliefs have been granted.	NRR	IMC 0350		Memo from NRR to IMC 0350 Panel	12/01/00	Closed 0350 Mtg. 11/28/00
C.5.d	Imposed orders have been modified or rescinded.	NRR	IMC 0350		Memo from NRR to IMC 0350 Panel	12/01/00	Closed 0350 Mtg. 11/28/00
C.5.e	Confirmatory Action Letter conditions have been satisfied.	Veget	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	11/21/00	Closed IR 2000023 (Pending)

Attachment 3

Item No.	Description	NRC Lead	Inspection Procedure	References	Documentation	ECD	Status
C.5.f	Significant enforcement issues have been resolved.	Vegel	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	11/21/00	Closed IR 2000023 (Pending)
C.5.g	Allegations have been appropriately addressed.	Vegel	IMC 0350		IR 2000023 (11/27/00 to 12/01/00)	11/21/00	Closed IR 2000023 (Pending)
C.5.h	10 CFR 2.206 Petitions have been appropriately addressed.	NRR	IMC 0350		Memo from NRR to IMC 0350 Panel	12/01/00	Closed 0350 Mtg. 11/28/00
C.6	Coordination with Interested Agencies and Parties						
C.6.e.1	Appropriate state and local officials -FEMA	RIII State Liaison Officer	IMC 0350		Memo to IMC 0350 Panel		Closed 0350 Mtg. 11/28/00
C.6.e.2	Appropriate state and local officials -Congressional Affairs	NRR RIII PAO	IMC 0350		RIII PAO to provide press release to OCA		Open
C.6.e.3	Appropriate state and local officials -Inform Stakeholders (UCS)	NRR	IMC 0350		Memo to IMC 0350 Panel		Closed 0350 Mtg. 11/28/00
C.6.f	Appropriate public interest groups.	Public Affairs	IMC 0350		N/A		Open
C.6.g	Local news media.	Public Affairs	IMC 0350		N/A		Open