DD-99-03

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Samuel J. Collins, Director

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| In the Matter of | ) | Docket Nos. 50-315<br>50-316 |
| INDIANA MICHIGAN POWER COMPANY | ) | License Nos. DPR-58<br>DPR-74 |
| (Donald C. Cook Nuclear Plant, Units 1 and 2) | ) | (10 CFR 2.206) |

DIRECTOR'S DECISION UNDER 10 CFR 2.206

## I. INTRODUCTION

On October 9, 1997, Mr. David A. Lochbaum submitted a Petition to the Executive Director for Operations of the U.S. Nuclear Regulatory Commission (NRC) pursuant to Section 2.206 of Title 10 of the Code of Federal Regulations (10 CFR 2.206). The Petition was submitted on behalf of the Union of Concerned Scientists (UCS or Petitioner) and requested that the operating licenses for the Donald C. Cook Nuclear Plant, Units 1 and 2 (D. C. Cook) be modified, revoked, or suspended to prevent operation of the units until there is reasonable assurance that significant non-compliances have been identified and corrected so that systems are in conformance with their design-basis and licensing-basis requirements. The Petitioner also requested that a public hearing into this matter be held in the Washington, D.C. area before the first unit at D. C. Cook is authorized to restart. The Petitioner indicated that the basis for his request was derived from a completed NRC architect/engineering[1] (AE) design

[1]NRC Inspection Report (IR) No. 50-315, 50-316/97201, November 26, 1997.

inspection at D. C. Cook. Findings by the NRC during the AE inspection led to the Licensee declaring the emergency core cooling system (ECCS) inoperable at both units at D. C. Cook. As a result, the Licensee shut down both units in accordance with their Technical Specifications (TS). As stated in the Petition, the systems reviewed during the AE inspection were the same systems that the Licensee had reviewed earlier as part of its design-basis documentation reconstitution program. This review did not identify any deficiencies concerning equipment operability. Therefore, the Petitioner asserted that the D. C. Cook design-basis documentation reconstitution programs lacked the necessary rigor and focus to identify potential design-related operability issues. The Petitioner further asserted that deficiencies in the Licensee's design control programs may also be responsible for similar issues in safety systems that have not been examined by the NRC. On the basis of this potential, the Petitioner also requested that the NRC increase the inspection scope at D. C. Cook.

On December 9, 1997, the NRC acknowledged receipt of the Petition and informed the Petitioner that the Petition had been assigned to the Office of Nuclear Reactor Regulation (NRR) to prepare a response and that action on the specific concerns raised in the Petition would be taken within a reasonable time.

By letter dated January 12, 1998, the Petitioner submitted an Addendum to the Petition. The Addendum raised additional issues concerning D. C. Cook and provided additional information concerning the Petition. In addition, the Addendum raised concerns dealing with the 10 CFR 2.206 process, the NRC inspection process, and generic concerns with ice condenser containments. On February 23, 1998, the NRC acknowledged receipt of the additional information and informed the Petitioner that the specific concerns related to the D. C. Cook plant and the Petition would be considered in the Director's Decision. Further, the NRC informed the Petitioner that the concerns not directly applicable to the requests in the Petition

would be evaluated and transmitted in separate correspondence. By letters dated July 10 and December 28, 1998, the NRC sent the Petitioner the status of the review of these issues not related to D. C. Cook or the Petition.

## II. DISCUSSION

### A. Request To Modify, Revoke, or Suspend the Operating Licenses for D. C. Cook Nuclear Plant, Units 1 and 2

The Petitioner based his request on the fact that the NRC had recently completed an AE design inspection at D. C. Cook and the inspection identified a number of issues concerning design and procedural controls, safety evaluations, use of engineering judgment, adequacy of operability determinations, temporary modifications, and consistency between the updated Final Safety Analysis Report (UFSAR) and the TS. The Petitioner asserted that the Licensee's design control programs were inadequate and there was the potential that similar issues could exist in other safety-related systems that the NRC had not inspected. The Petitioner requested that the units at D. C. Cook be prevented from operating until such time that there is reasonable assurance that significant non-compliances have been identified and corrected. The Petitioner stated in the Petition that the system certification process used at the Salem Nuclear Generating Station and the Millstone Nuclear Power Station would provide such reasonable assurance.

On September 8 and 9, 1997, the Licensee shut down both Unit 1 and Unit 2, respectively, because of inspection findings made by the NRC during the AE inspection. These findings led the Licensee to question the operability of the ECCS. Upon further investigation, the Licensee determined that the ECCSs in both units were inoperable and, in accordance with the TS, the Licensee shut down both units. By letter dated September 18, 1997, the Licensee identified several issues and corrective actions it would take preceding restart of either unit at

D. C. Cook. By letter dated September 19, 1997, the NRC issued a confirmatory action letter (CAL) confirming that nine specific issues from the Licensee's September 18, 1997, letter would be addressed by the Licensee before a unit at D. C. Cook would be restarted. In addition, the NRC recognized that the AE inspection was a limited-scope inspection and that the inspection findings were substantial. For this reason, the NRC confirmed that the Licensee, before restart of a unit at D. C. Cook, would perform an assessment to determine whether the type of inspection findings discovered during the AE inspection existed in other safety-related systems and whether they affected system operability.

By letters dated December 2, December 24, and December 31, 1997, the Licensee responded to the CAL. In these letters, the Licensee described the corrective actions, the root-cause analysis, and the reasons why the units at D. C. Cook were ready to restart. The NRC held public meetings with the Licensee on December 10 and December 22, 1997, and January 8, 1998, to discuss the Licensee's CAL responses.

The Petition raised concerns involving the Licensee's design control program and requested that a public hearing be held in the Washington, D.C. area before restarting either unit at D. C. Cook. The NRC staff reviewed the Petition thoroughly and determined that no new information was provided concerning D. C. Cook. The NRC staff came to this conclusion because the Petitioner based his concerns on the Licensee's design control program deficiencies that were identified in the NRC AE inspection. A CAL had been issued which confirmed that the Licensee would bound the problems discovered by the AE inspection and implement adequate corrective actions before restarting either unit at D. C. Cook. Therefore, following the guidelines contained in NRC Management Directive (MD) 8.11, "Review Process for 10 CFR 2.206 Petitions," the NRC staff came to the conclusion that new information was not provided and a hearing was not warranted.

In a telephone conversation on January 5, 1998, the NRC Petition Manager informed the Petitioner that new information was not provided in the Petition and, in accordance with MD 8.11, a public hearing would not be granted. By letter dated January 6, 1998, the Petitioner protested the NRC's decision not to hold a public hearing concerning the Petition. In that letter, the Petitioner stated that information concerning ice condenser issues was presented to the NRC Inspector General's Office and since D. C. Cook's containment operability relies on an ice condenser system this constituted new information. The Petitioner also stated that the Petition was developed and submitted in haste because NRC Region III officials indicated that the Licensee was planning to restart a unit at D. C. Cook in mid-October 1997 and the Petitioner wanted to submit the Petition before the first unit at D. C. Cook was restarted. For this reason, the Petition had not been fully developed and additional information would be forthcoming. On the basis of concerns that the Petitioner raised in the January 6, 1998, letter, and the assertion that the Petitioner potentially had new information, the NRC held a public meeting with the Petitioner on January 12, 1998. During the meeting, the Petitioner raised general concerns about the 10 CFR 2.206 process and addressed the following six specific concerns covering a broad range of issues:

(1) ice condenser concerns

(2) 10 CFR 50.59 Safety Evaluation process

(3) engineering calculations

(4) net positive suction head (NPSH) calculations

(5) licensee's response to the CAL

(6) NRC inspection process

By letter dated January 12, 1998, the Petitioner issued an Addendum to the Petition documenting the issues discussed during the January 12, 1998, public meeting. By letter dated February 23, 1998, the NRC acknowledged the receipt of the Addendum. Issues 1 through 5, as they relate to D. C. Cook and the Petition, are discussed individually in Sections II.B through II.F of this Director's Decision. As stated above, all issues raised in the Addendum not related to D. C. Cook or the Petition are being evaluated and will be addressed independent of the 10 CFR 2.206 process in separate correspondence.

The NRC staff reviewed the new information provided in the Addendum according to the guidelines of MD 8.11 and concluded that the additional information presented in the January 12, 1998, Addendum met the criteria for holding an informal public hearing. As a result, the NRC granted the Petitioner's request for an informal public hearing. On August 19, 1998, an informal public hearing was held at NRC headquarters in Rockville, Maryland. Both the Petitioner and the Licensee made presentations at the hearing. The hearing gave the Petitioner an opportunity to clarify the issues raised in the Petition and the Addendum. During the hearing, the Petitioner reported being pleased with the NRC oversight activities at D. C. Cook. Further, the Petitioner indicated he would like to see a Millstone scale civil penalty issued to the Licensee to ensure that the Licensee will maintain the proper safety culture in the future. During the hearing, the Petitioner also requested that the NRC investigate the potential that the Licensee's December 2, 1997, letter contained material false statements concerning the readiness of a unit at D. C. Cook to restart. This issue has been referred to the NRC Region III office for resolution and the results will be forwarded to the Petitioner under a separate cover.

In an effort to assess the effectiveness of the Licensee's corrective actions and the readiness of the units at D. C. Cook to restart, NRC performed an inspection of the CAL issues.

The results of the inspection are documented in NRC Inspection Report (IR) No. 50-315, 50-316/98004. The team of inspectors reviewed the nine specific issues identified in the CAL and considered them adequately addressed. The inspection team concluded that the short term assessment items were appropriate and bounded the AE inspection concerns. However, as described in the NRC July 30, 1998, letter to the Licensee, the CAL remains open pending the resolution of concerns involving the adequacy of the Licensee's assessment to determine whether the type of issues discovered during the AE inspection existed in other safety-related systems. By letter dated January 15, 1998, the Petitioner requested a copy of the inspection report, even if it was a preliminary version subject to revision, at least 1 business day before closing the CAL. In the NRC's February 23, 1998, letter, the request to release the draft inspection report was denied. As stated in the February 23, 1998, letter, it is not NRC policy to release draft predecisional information. This policy is intended to prevent improper influences and assure that predecisional information, or contemplated enforcement actions, are not compromised by a premature release. In accordance with MD 8.11, once the Petition was received, the Petitioner was placed on distribution for correspondence between the NRC and D. C. Cook. The Petitioner has subsequently received a copy of the IR.

The NRC expanded the scope of inspections of the D. C. Cook facility based on findings of the resident inspector staff, concerns that came to the NRC's attention regarding the ice condenser issues emanating from the AE inspection, and information brought to our attention by the Petitioner. This expanded scope of inspection satisfied the request in the Petition. From November 1997 until April 1998, the NRC performed inspections of the containment (IR No. 50-315, 50-316/97017), ice condenser (IR No. 50-315, 50-316/98005), hydrogen mitigation systems (IR No. 50-315, 50-316/98009), and the design-basis (IR No. 50-315, 50-316/98004). The inspections identified that NRC requirements had been violated. The apparent violations

were discussed at a public predecisional enforcement conference held at the NRC Region III office on May 20, 1998, with video viewing by the NRC headquarters staff, the Petitioner, and other members of the public in the NRC headquarters offices located in Rockville, Maryland.

During the predecisional enforcement conference, the Licensee admitted to all the apparent violations that formed the basis for the conference, described its assessment of the root causes, and presented its proposed corrective actions to address these issues. The Licensee stated that a root cause for many of these apparent violations was the failure to establish and communicate adequate performance standards.

As documented in the IRs, extensive degradation of the design of each unit's ECCS, ice condenser, refueling water storage tanks (RWSTs), and containment sumps, impaired the ability of the barriers (fuel cladding and containment) to prevent fission product release to the environment in the event of a design-basis loss-of-coolant accident (LOCA). With regard to the fuel cladding barrier, deficiencies were identified involving (1) a large quantity of fibrous materials within containment which would likely have clogged the ECCS sump screens in the recirculation mode, (2) a single-failure ECCS vulnerability, and (3) the insufficient amount of water available in the ECCS sump which represents a challenge to cool the fuel post LOCA. With regard to the containment barrier, the effects on the degraded ice condenser from blocked ice bed flow passages, missing ice segments, and ice basket damage represented a serious challenge to the ability of the ice condenser to perform its intended function to condense steam and suppress containment pressure. These conditions seriously impaired the safety function of the ECCS and the containment. Further, beyond the specific systems addressed by this enforcement action, two additional systems related to the containment, the hydrogen ignition and containment spray systems, were also degraded during the same period and, following analysis, the Licensee declared these systems inoperable.

During the informal public hearing, the Petitioner requested that the NRC issue a "Millstone" scale [2] civil penalty for the violations of NRC requirements at D. C. Cook. The violations were collectively categorized in accordance with the NRC Enforcement Policy (NUREG-1600) as a Severity Level II violation. This severity level was warranted for the breadth and number of the violations that, taken in total, resulted in a lack of reasonable assurance that following a design-basis accident, the ECCS and containment would have performed their intended functions.

On October 13, 1998, the NRC issued the Notice of Violation and associated proposed civil penalty to the Licensee. Accordingly, after considering the information obtained during the informal public hearing and predecisional enforcement conference, and after consultation with the Commission, the NRC staff chose to exercise discretion pursuant to Section VII.A.1 of the NRC Enforcement Policy and assessed a penalty in the amount of $500,000. Specifically, the escalated civil penalty reflected the consideration of the poor performance by the Licensee, the duration of the problems, the adverse impact on the ECCS and the containment, and the NRC's concerns regarding the violations. The purpose of the enforcement action was to emphasize the need for (1) taking timely and effective corrective actions for identified deficiencies, (2) effective surveillance testing and for plant personnel to challenge and investigate discrepancies identified during surveillance activities, (3) rigorous safety evaluations to determine whether changes to the plant or procedures constitute unreviewed safety questions, (4) maintaining the plant's design and licensing bases, and (5) a strong self-assessment program. The NRC staff would have proposed a larger civil penalty had it not been for the Licensee's decision to take

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[2] On December 10, 1997, the NRC issued Enforcement Action EA 96-34 to Northeast Utilities which included Severity Level II violations and $2.1 million civil penalty.

comprehensive corrective actions and a commitment to keep the facility shut down until these problems are resolved.

Compliance with regulations, license conditions, and TS, and operation of a facility in accordance with the licensing basis is mandatory. However, the NRC also recognizes that plants will not operate trouble-free.[3] This is clearly articulated in Criterion XVI, Appendix B, Part 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." Criterion XVI states that "measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected." The appropriate response to an identified deficiency can and should vary, depending on the safety significance of the deficiency.

The conduct of NRC regulatory oversight at the D. C. Cook site is based on the recognition that it is the Licensee's responsibility to comply with its license and safety requirements and to take corrective actions when deficiencies are identified. Thus, the Licensee must determine that a unit is in conformance with applicable NRC regulations, its

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[3] The NRC's regulations for protection of public health and safety embrace the philosophy of defense-in-depth, which supports the identification and correction of degraded or nonconforming conditions previously discussed. Briefly stated, this philosophy (1) requires the application of conservative codes and standards to establish substantial safety margins in the design of nuclear plants; (2) requires high quality in the design, construction, and operation of nuclear plants to reduce the likelihood of malfunctions, and promotes the use of automatic safety system actuation features; (3) recognizes that equipment can fail and operators can make mistakes, and therefore, requires redundancy in safety systems and components to reduce the chances that malfunctions or mistakes will lead to accidents that release fission products from the fuel; and (4) recognizes that, in spite of these precautions, serious fuel damage accidents can happen and, therefore, requires containment structures and safety features to mitigate the release of fission products. In the unlikely event of an offsite fission product release, emergency plans are in place to provide reasonable assurance that protective actions can and will be taken to protect the population around nuclear power plants. These emergency plans are coordinated with local and State officials and the Federal Emergency Management Agency.

license conditions, its UFSAR, and that applicable licensing commitments have been met before a unit is ready to restart. The Licensee's conformance with NRC regulations, license conditions, and licensing commitments is fundamental to the NRC's confidence in the safety of licensed activities. In short, the Licensee has the primary responsibility for the safe operation of its facilities.

By letter dated March 7, 1998, the Licensee docketed the D. C. Cook Nuclear Plant Restart Plan (Restart Plan). The Restart Plan is the principal program to provide reasonable assurance that weaknesses at the D. C. Cook units are identified and appropriate corrective actions are implemented. The Restart Plan includes efforts to understand and correct the licensing- and design-bases issues that, in part, led to the Licensee shutting down both units at D. C. Cook and the NRC taking escalated enforcement action. Revision 4 of the Restart Plan was submitted by the Licensee on December 16, 1998. The Licensee's Restart Plan included system readiness reviews for the most risk-significant systems at D. C. Cook. The reviews included evaluation of the UFSAR and TS design requirements, surveillance tests for the system, a review of design modifications, and a review of temporary modifications.

The NRC, in an effort to assess the effectiveness of the system readiness reviews, scheduled a safety system functional inspection (SSFI) on the auxiliary feedwater (AFW) system. The Licensee requested permission to conduct and subsequently conducted the SSFI, using independent contractors. The NRC provided oversight of the Licensee's SSFI through an inspection team. The NRC IR No. 50-315, 50-316/98017 associated with the oversight of the Licensee's SSFI was issued on January 28, 1999. In a public meeting on October 22, 1998, the Licensee presented the preliminary findings from the SSFI. The SSFI identified a number of issues, including findings that questioned the operability of the AFW system under certain accident conditions. These findings had not been identified by the Licensee's AFW system

readiness review. In a public meeting on December 22, 1998, the Licensee stated that enhancements would be made to the system readiness review process and a more thorough review of the most risk-significant systems would be performed before restart of a unit at D. C. Cook. These changes will be incorporated into the Licensee's Restart Plan.

Through the implementation of the Restart Plan, the Licensee has documented a large number of deficiencies that vary in scope and safety significance for each unit. The Licensee has identified deficiencies that must be corrected before restart. In its continuing review of the Licensee's corrective actions, the NRC will determine whether the Licensee has appropriately scheduled safety-significant items for completion before restart and whether the decision to defer selected corrective actions until after restart is appropriate for each unit. The results of these efforts will be documented in NRC IRs.

The NRC has developed a comprehensive and multifaceted oversight process to provide reasonable assurance that the Licensee has identified necessary issues and implemented required corrective actions. Because of the extent of issues discovered at D. C. Cook, the NRC has chosen to use the guidelines contained in NRC Inspection Manual Chapter (MC) 0350, "Staff Guidelines for Restart Approval" to conduct the oversight of the Licensee's corrective actions. MC 0350 establishes the guidelines for approving the restart of a nuclear power plant after a shutdown resulting from a significant event, a complex hardware problem, or serious management deficiencies. The primary objective of the guidelines in MC 0350 is to ensure that NRC's restart review efforts are appropriate for the individual circumstances, are reviewed and approved by the appropriate NRC management levels, and provide objective measures of restart readiness. In accordance with MC 0350, a restart panel has been established. Members include senior managers from both NRC Region III and the NRR offices. The NRR project manager and the senior resident inspector are also on the

panel. The panel meets internally to discuss restart issues on a weekly basis, and holds meetings approximately monthly with the Licensee to discuss the Licensee's corrective actions and schedules. The monthly meetings with the licensee are noticed and are open to the public.

By letters dated July 30 and October 13, 1998, the NRC forwarded to the Licensee the Case Specific Checklist for D. C. Cook in accordance with the MC 0350 guidelines. The checklist specified the activities the NRC considers necessary to be addressed before the restart of a unit at D. C. Cook. The items on the list were derived from the NRC's review of inspection activities, the CAL, and the Licensee's Restart Plan. As new issues emerge the Case Specific Checklist will be changed, and new issues necessary to be addressed before restart will be added to the list.

B. Ice Condenser Concerns

In the Addendum, the Petitioner identified problems in the configuration and testing of the ice condenser at the Watts Bar Nuclear Power Plant. The Addendum specifically identified problems with the inlet bay doors, floor upheaval, and ice basket components. The Addendum also stated that those problems were known, but were not properly reported by the Watts Bar Licensee (the Tennessee Valley Authority ), the D. C. Cook Licensee (Indiana Michigan Power Company), the McGuire Licensee (Duke Power), and the vendor (Westinghouse). The Petitioner questioned if the Watts Bar ice condenser problems were valid and if they applied to the D. C. Cook facility. In the NRC's February 23, 1998, acknowledgment letter, the Petitioner was informed that the specific concerns regarding ice condenser issues at D. C. Cook would be addressed in the Director's Decision. All other issues concerning ice condensers at other facilities and the vendor will be reported on in separate correspondence. By letters dated July 10 and December 28, 1998, the Petitioner was informed of the review status of these issues.

As a result of concerns with the ice condensers at the D. C. Cook facility, the NRC Region III office initiated an inspection of the ice condensers. The Petitioner's concerns raised in the Addendum were incorporated into that inspection. In addition to the concerns raised in the Addendum, the inspection also reviewed activities associated with the surveillance test program of the ice condensers, the corrective actions performed on the ice condensers, and how the Licensee maintained the design-basis documentation concerning the ice condensers. The findings of the inspection were documented in NRC IR No. 50-315, 50-316/98005.

The inspectors determined that the overall material condition of the ice condensers was poor and some of the concerns raised by the Petitioner were confirmed. The issues raised in the Addendum concerning the inlet bay doors and the floor upheaval were not substantiated. The team inspected the doors of the ice condensers and found them to be functional but in poor material condition. In addition, the team identified deficiencies in the design-basis testing of the inlet bay doors. The team also inspected the ice condenser floor sections, which have the potential to heave and prevent the bay doors from operating properly. No signs of floor upheaval or degradation were detected. Concerning the issue of deficiencies of ice basket components; the team identified defective and damaged ice baskets. Examples include the following: (1) dented and buckled ice basket webbing, (2) missing sheet metal screws used to couple the ice baskets together, (3) loose and missing U-bolt nuts on lower ice basket assemblies, (4) separated ice baskets, and (5) failed fillet welds at the ice basket bottom hold-down bar. The team inspection identified 29 apparent violations of NRC requirements. As stated in Section II. A. of the Director's Decision, these violations were part of the overall enforcement action taken by the NRC.

In the Addendum, the Petitioner raised the concern that the Licensee was aware of the deficiencies with the ice condenser and did not properly report the deficiencies. While the

Licensee's staff had knowledge of some of the inspection issues, it was not apparent that the Licensee was aware of the significance of those issues until they were discovered by the NRC and followed up by the Licensee during the inspection. Contributing to the Licensee's failure to recognize the significance of those issues was the breakdown of the corrective action program. As stated in Section II.A these issues were a part of the overall enforcement action. Therefore, the problems the Licensee's staff identified with the ice condenser were not properly resolved or reported by the Licensee. Following the inspection, the Licensee has submitted several LERs reporting on the deficiencies identified with the ice condenser in accordance with 10 CFR 50.73. In addition, on July 30, 1998, the Licensee issued a report in accordance with 10 CFR Part 21 informing the NRC of potential defects with failed fillet welds at the ice basket hold down bar.

In March 1998, the Licensee decided to completely melt out the ice condensers of both units to allow thorough inspections and comprehensive repairs of the ice condensers. Following the meltout of the ice condensers, the Licensee discovered foreign material in the ice baskets. Some material appeared to be from the original construction. Also, the Licensee identified damage to the ice baskets and other ice condenser components. The restoration of the ice condenser has been incorporated into the Licensee's Restart Plan. The Licensee chose to repair damaged components and reinspect the ice condensers to assure that corrective actions have been adequately implemented and the material condition of the ice condensers has been returned to its original design-basis. In addition to the physical repairs to the ice condenser, the Licensee has reviewed the ice condenser surveillance program and intends to complete revised ice condenser surveillance tests to ensure that the ice condensers are operable and will perform their intended function.

Resolution of the ice condenser problems is an item on the MC 0350 Case Specific Checklist and the Licensee's corrective actions are monitored by the MC 0350 restart panel.

Corrective actions implemented by the Licensee will be inspected before the restart of a unit at D. C. Cook.

C. 10 CFR 50.59 Safety Evaluation Process

During the AE inspection, the NRC inspectors identified problems with the 10 CFR 50.59 process at D. C. Cook. In the Addendum, the Petitioner raised a concern that the Licensee's 10 CFR 50.59 safety evaluation preparation process was "bad" and that a thorough enough review of old 10 CFR 50.59 safety evaluations had not been performed. Further, the Petitioner questioned if safety evaluations prepared using the "bad" 10 CFR 50.59 process potentially could mean that unidentified safety problems remain at D. C. Cook.

Following the AE inspection, the Licensee initiated corrective actions to address the 10 CFR 50.59 issues identified during the AE inspection. The Licensee assessed the 10 CFR 50.59 process in December 1997. The Licensee reviewed 10 CFR 50.59 screenings and unreviewed safety question determinations performed between January 1996 and September 1997. The Licensee identified several administrative or procedural problems. The Licensee's assessment did not identify issues that would have an impact on the technical conclusions reached in any safety evaluation prepared in accordance with the 10 CFR 50.59 process.

To evaluate the corrective actions taken by the Licensee following the AE inspection, the NRC performed an inspection of the 10 CFR 50.59 process at D. C. Cook. The inspectors reviewed procedure and design change safety evaluations. The team did not identify any safety evaluations performed by the Licensee using the "old" 10 CFR 50.59 process that resulted in a safety system operability concern, or where the change would have resulted in an unreviewed safety question determination. The inspection did, however, identify apparent violations of 10 CFR 50.59 concerning the failure to perform safety evaluations for proposed changes to the plant design basis. The violations resulted from the Licensee's failure to

recognize that implemented changes constituted a change to the plant's design basis as described in the UFSAR. Violations were also identified pertaining to the adequacy of safety evaluations. The inspection made it evident that weakness still existed in the Licensee's 10 CFR 50.59 program and substantiated the concerns raised in the Addendum with the Licensee's 10 CFR 50.59 process. The specific details of the findings are contained in the IR No. 50-315, 50-316/98004.

As a result of the inspection findings from both the AE inspection and IR No. 50-315, 50-316/98004, the Licensee has performed three additional self-assessments of the effectiveness of its 10 CFR 50.59 program. The Licensee's review sample was selected from a population of 50.59 safety evaluations beginning in the 1980s. As a result of the deficiencies identified through these self-assessments, the Licensee committed to implement a number of programmatic changes to improve the 10 CFR 50.59 process at D. C. Cook. Further, the Licensee has committed to perform enhanced system readiness reviews as stated above. These commitments have been incorporated into the Licensee's Restart Plan and will be implemented before restart of a unit at D. C. Cook.

Inspections to date of the Licensee's 10 CFR 50.59 process have not identified any safety evaluations performed by the Licensee that resulted in safety system operability concerns. However, the Licensee's enhanced system readiness reviews may discover 10 CFR 50.59 safety evaluations that are inadequate and that may result in safety system operability concerns. Because of the nature and number of 10 CFR 50.59 violations, the NRC placed the 10 CFR 50.59 process on the MC 0350 Case Specific Checklist. Corrective actions taken by the Licensee will be inspected by the NRC staff before restart of a unit at D. C. Cook to assure that the 10 CFR 50.59 program implementation at D. C. Cook provides adequate assurance of safety.

D. Engineering Calculations

In the Addendum, the Petitioner identified concerns involving engineering calculations at D. C. Cook. The Petitioner questioned whether the population of calculations, reviewed by the Licensee as part of the corrective actions taken in response to inspection findings from the AE inspection, was a representative sample. In addition, the Petitioner questioned whether the NRC was satisfied with corrective actions taken by the Licensee in response to the calculation weaknesses identified by the NRC during the AE inspection.

The NRC inspected the corrective actions taken by the Licensee in this area. The NRC inspection findings were documented in NRC IR No. 50-315, 50-316/98004. The inspection concluded that the older calculations (early 1970 vintage) appeared to satisfy their intended purpose; however, problems still existed with calculations at D. C. Cook and the initial corrective actions implemented by the licensee had been unsuccessful in bounding the problem.

On the basis of the inspection findings, the Licensee chose to expand the scope of engineering calculations to be reviewed to determine the quality, level of detail, completeness and accuracy of the calculations before restart of a unit. The Licensee expanded its review to include a significant sample of the calculations for the most risk significant systems. The Licensee's expanded review identified a number of deficiencies in engineering calculations. As a result of these deficiencies, the Licensee has committed to corrective actions to change the calculation preparation procedure and to train all calculation preparers, verifiers, and approvers on the new procedures.

In summary, because of the extent of the problems with engineering calculations and design control at D. C. Cook, the MC 0350 restart panel incorporated this issue into the Case Specific Checklist. Before restart of a unit at D. C. Cook, the NRC will evaluate corrective actions taken by the Licensee to assess whether the Licensee has been successful in

correcting the weakness in the engineering calculation program at D. C. Cook and that the calculation adequacy provides reasonable assurance of safety.

E. Net Positive Suction Head (NPSH) Calculations

In the Addendum, the Petitioner stated that from the time the Petition was submitted on October 9, 1997, until the time the Licensee responded to the CAL on December 2, 1997, the Petitioner received concerns from an individual at D. C. Cook indicating problems with NPSH calculations. The alleged problems involved both missing and inaccurate calculations. The Petitioner questioned if safety-related pumps at D. C. Cook have adequate NPSH as shown by quality calculations.

In response to the concerns raised in the Addendum, the NRC staff requested by letter dated June 8, 1998, that the Licensee provide (1) the NPSH calculations for all safety-related pumps, (2) a description of the calculation technique, and (3) all assumptions used in the calculations. By letters dated July 22, July 31, and August 5, 1998, the Licensee provided the requested information.

The NRC staff reviewed the NPSH calculations for each safety-related pump at D. C. Cook. With the exception of the containment spray (CTS) and the residual heat removal (RHR) systems, the NRC found that the calculations submitted by the Licensee supported adequate NPSH for the safety related pumps. For the CTS and RHR systems the values used for the pump run out flows in the UFSAR did not match the values used in the NPSH calculations. Because of the inconsistencies in the values used for the pump run-out flows, the NRC was unable to determine whether the NPSH calculations of record for the CTS and RHR systems demonstrated adequate NPSH for the pumps in these systems. By letter dated January 7, 1999, the NRC informed the Licensee of the inconsistencies discovered during the review of the NPSH calculations. Further, the letter requested the Licensee to provide revised

NPSH calculations addressing the inconsistencies in the CTS and RHR systems NPSH calculations, and show that adequate NPSH is available for the safety-related pumps in these systems. In addition, the issue of adequate NPSH for safety-related pumps will be monitored by the MC 0350 restart panel. The Licensee's resolution of the issue will be reviewed and evaluated by the NRC.

In summary, the Petitioner stated that there were missing and inaccurate NPSH calculations for safety-related pumps at D. C. Cook. Upon request, the Licensee provided the NPSH calculation for all safety-related pumps at D. C. Cook. The Licensee's response demonstrated that there were NPSH calculations for all safety-related pumps at D. C. Cook. When the calculations were reviewed by the NRC, inconsistencies were discovered in values documented in the UFSAR and those used in the NPSH calculations. These concerns have been identified and transmitted to the Licensee. The Licensee's corrective actions will be monitored through the MC 0350 process to ensure appropriate actions are taken.

F. Licensee's Response to the CAL

In the Addendum, the Petitioner raised a concern about the credibility of the Licensee's response to the CAL. The Petitioner stated that since the Licensee's February 6, 1997, response to the NRC's October 9, 1996, 10 CFR 50.54(f) request for design-basis information was not accurate, based on the AE inspection finding, he could not see how the Licensee's response to the CAL could be accurate.

Following the Licensee's response to the CAL, the NRC performed additional inspections at D. C. Cook, documented in IR Nos. 50-315, 50-316/98004; 50-315, 50-316/98005; and 50-315, 50-316/98009. The findings of these inspections clearly showed that the Licensee's actions to bound the scope of engineering problems in response to the CAL were too narrowly focused and were not sufficient to address the broad array of problems

concerning the design-basis and licensing-basis issues that existed at D. C. Cook.

The Petitioner's concern in the Addendum (that the Licensee's response to the CAL failed to assure the NRC that corrective actions were adequate) has been substantiated. The inspection findings from early 1998 indicated that the CAL response did not bound the design-basis and licensing-basis issues at D. C. Cook. As indicated in Section II.A of the Director's Decision, the NRC took escalated enforcement action against the Licensee. In response to the violations and various programmatic breakdowns at D. C. Cook, the Licensee made a decision in early 1998 to perform a comprehensive assessment to provide reasonable assurance of plant system readiness, programmatic readiness, functional area readiness, and containment readiness before restart of either unit. The Licensee's primary mechanism to implement each of the plant assessment programs is the D. C. Cook Nuclear Plant Restart Plan. The Restart Plan was submitted in March 1998, and Revision 4 of the Restart Plan was docketed on December 16, 1998. As stated above, the NRC is using the guidelines in MC 0350 to oversee the Licensee's corrective actions and the readiness of a unit to restart. As additional problems or concerns are identified during the implementation of the Restart Plan, appropriate adjustments will be made to the Restart Plan and the Case Specific Checklist.

## III. NRC RESPONSE TO REQUESTED ACTION

### A. Request To Modify, Revoke, or Suspend the Operating Licenses for D. C. Cook, Units 1 and 2

The Petitioner requested that the operating licenses for D. C. Cook, Units 1 and 2 be modified, revoked, or suspended to prevent operation of the units until there is reasonable assurance that significant non-compliances have been identified and corrected so that systems

are in conformance with their design-basis and licensing-basis requirements. In addition, the Petition requested that the NRC broaden the inspection scope at D. C. Cook following the AE inspection. The NRC's regulatory oversight actions taken thus far at D. C. Cook, in part, fulfill the actions requested in the Petition. The regulatory oversight actions at D. C. Cook are broad and comprehensive and will ensure that there is reasonable assurance of safety prior to restart of either unit.

Inspection findings at D. C. Cook following the AE inspection verified that the corrective actions implemented by the Licensee as described in the CAL response were too narrowly focused and did not fully address the design-basis and licensing-basis issues. The NRC increased inspections at D. C. Cook identified a number of violations of NRC requirements, and as a result, took appropriate enforcement action against the Licensee as stated above. While the enforcement action did not modify, suspend, or revoke the operating licenses of the D. C. Cook facilities, it did emphasize the serious nature of the violations, the duration of the problems, and the Licensee's poor performance.

The Licensee has developed an integrated Restart Plan. The plan provides the frame-work to be used by the Licensee to identify, evaluate, and correct issues. The NRC regulatory oversight at D. C. Cook is following the guidelines of MC 0350 as discussed above. This approach focuses the correct level of management attention as well as resources on significant issues to be verified before restart of a unit at D. C. Cook. In addition, this approach allows the NRC the flexibility to change the focus of the oversight as different significant issues emerge. In the Licensee's effort to identify and correct issues, new issues will continue to emerge. As a result, the Licensee will be expected to modify the Restart Plan to ensure that corrective actions, to resolve the emergent issues, are implemented in a timely manner. The

MC 0350 restart panel will review these changes to the Restart Plan to ensure that the Licensee has taken appropriate corrective actions.

The Petitioner's request to suspend, modify, or revoke the licenses at D. C. Cook, Units 1 and 2 has not been granted at this time. The current regulatory oversight at D. C. Cook is sufficient, and provides reasonable assurance that before restart of a unit at D. C. Cook the Licensee will have identified and corrected issues so that the safety systems at D. C. Cook will be in compliance with their design-basis and licensing-basis requirements.

B. Request To Hold a Public Hearing on the Issues Raised in the Petition Before Restart of a Unit at D. C. Cook

The Petitioner requested that a public hearing into the issues raised in the Petition be held in the Washington, D.C. area before the first unit at D. C. Cook is authorized to restart. As discussed above, this request was granted. On August 19, 1998, an informal public hearing was held at the NRC headquarters in Rockville, Maryland. Both the Petitioner and the Licensee made presentations during the hearing. The hearing gave the Petitioner an opportunity to clarify the issues raised in the Petition and the Addendum.

C. Issues Raised in the Addendum

As discussed in Sections II. B. through II. E. of this Director's Decision, each of the actions requested by the Petitioner in the Addendum has been granted in that the Licensee is taking additional corrective actions to ensure that each issue raised in the Addendum will be resolved before restart of a unit at D. C. Cook, and the NRC will verify that the Licensee's corrective actions have been effective. Each of the issues raised in the Addendum will be reported on in a future inspection report.

## IV. CONCLUSION

The NRC has determined, for the reasons given in the preceding discussion, that the request to prevent operation of the units at D. C. Cook until there is reasonable assurance that significant non-compliances have been identified and corrected so that systems are in conformance with their design-basis and licensing-basis requirements has been satisfied. The regulatory oversight actions being taken by the NRC as stated above will provide reasonable assurance that systems at D. C. Cook will be in conformance with their design-basis and licensing-bases, thus meeting the request made in the Petition and eliminates the need to modify, suspend, or revoke the licenses at D. C. Cook. The request to hold a public hearing into the issues raised in the Petition and Addendum in the Washington, D.C. area before the first unit at D. C. Cook is authorized to restart has been granted. Action has been taken on each concern identified in the Addendum, as stated above.

As provided for in 10 CFR 2.206(c), a copy of this Decision will be filed with the Secretary of the Commission for the Commission's review. This Decision will constitute the final action of the Commission 25 days after issuance unless the Commission, on its own motion, institutes review of the Decision at that time.

Dated at Rockville, Maryland this 11th day of February 1999.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation