U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99003(DRS); 50-316/99003(DRS)
Licensee:	Indiana Michigan Power Company
Facility:	Donald C. Cook Nuclear Generating Plant
Location:	American Electric Power Corporate Office Buchanan, Michigan
Dates:	March 8-12 and March 22-26, 1999
Inspectors:	M. Holmberg, Reactor Engineer R. Mendez, Reactor Engineer N. Shah, Reactor Engineer
Approved by:	John Jacobson, Chief, Mechanical Engineering Branch Division of Reactor Safety

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EXECUTIVE SUMMARY

D. C. Cook, Units 1 and 2
NRC Inspection Report 50-315/99003(DRS); 50-316/99003(DRS)

This was a special engineering inspection to evaluate implementation of the expanded system readiness review program, and assess the progress of the expanded system readiness review teams. Due to weaknesses in previous evaluations of system readiness for restart, the licensee initiated the expanded system readiness review program to identify system design and materiel condition concerns requiring resolution to provide reasonable assurance that plant systems were capable of operating within their design and licensing basis.

- The licensee was effectively identifying system deficiencies through the expanded system readiness review process. Programmatic and technical concerns that were identified included cable separation, electrical breaker refurbishment, and seismic mounting. The threshold for identification of problems was conservatively low, with 80 to 100 condition reports per day being initiated by the expanded system readiness review teams. (Section E3.1)

- Examples were identified where issues could not be consistently dispositioned due to erroneous or missing information in the electronic database, or because limited or incorrect problem descriptions were documented in condition reports. In particular, design requirements were not considered during one condition report disposition, that resulted in an inspector-prompted concern with improper instrument line slopes. Collectively, these issues could result in problems not being properly resolved or prioritized. (Section E3.1)

- Overall, the system walkdowns appeared effective at identifying design and configuration deficiencies, as exemplified by the spray header blockage concern. Most walkdown teams used comprehensive checklists to verify design parameters such as electrical separation, protective relay settings, transformer tap settings, and grounding. However, isolated weaknesses were identified with specific walkdowns which initially appeared to focus on materiel condition instead of design attributes. (Section E4.1)

- Preparation steps for the expanded system readiness review walkdowns did not require the teams to review prior modifications. This was considered a potential weakness in the program because of previously identified programmatic deficiencies in the design control process. (Section E4.1)

- Management maintained good oversight of the expanded system readiness review process and was appropriately addressing issues. The System Readiness Review Board provided technical rigor and consistency of approach for the expanded system readiness review team products, and identified generic issues of concern. In addition, after adjusting their participation in system walkdowns, the Performance Assurance group maintained an active and independent oversight role in the expanded system readiness review process. (Section E7.1)

Report Details

III. Engineering

E3 Engineering Procedures and Documentation

E3.1 Expanded System Readiness Review (ESRR) Documentation and Disposition of Engineering Issues

a. Inspection Scope (40500)

The inspectors reviewed condition reports and action requests, and interviewed members from several ESRR teams, to determine if identified deficiencies were being properly dispositioned.

b. Observations and Findings

b.1 Overall ESRR Findings

Approximately 80 to 100 condition reports per day were being initiated by the ESRR teams and the inspectors confirmed that the licensee was keeping an up-to-date list of the more significant technical issues identified. As a result of this effort, the licensee had identified technical issues that indicated broader or programmatic areas of concern. At the March 24, 1999 public meeting, the licensee identified issues with cable separation, 4000 Volt (4kV) breakers, and heating/ventilation system seismic mounting concerns, that required further investigation. The threshold for the identification of problems was conservatively low. The number and types of issues documented in condition reports generated by the ESRR teams, indicated that the licensee was identifying deficiencies that could potentially impact system design functions.

b.2 Errors Resulting from Transfer of Condition Reports into Electronic Database

The inspectors identified several condition reports with erroneous or missing information which could impact licensee followup and resolution. These reports were among those which had been transferred into a newly implemented computerized database which allowed the licensee to electronically input and track identified problems. For example, condition report No. 99-4490 described several pieces of foreign material found inside the Unit 1 east containment spray system heat exchanger. The inspectors noted that the original report contained a recommendation by a licensee supervisor that this event be reviewed by the engineering group. However, this recommendation was not stated in the associated database entry. Additionally, the database entry stated that this event affected other systems and had potential industry impact. However, the basis for these conclusions was unknown as they were not described in the original report or were identified by the licensee staff investigating this problem. A preliminary investigation by the licensee, identified additional, similar examples and concluded that the overall issue likely resulted from incorrect guidance given to the data entry staff about the new electronic database. The licensee planned to document this investigation and associated corrective actions in a condition report.

b.3 Condition Reports with Limited Description of Condition

The inspectors identified condition reports that had limited or incorrect descriptions of the identified discrepant condition that could have resulted in deficiencies not being properly investigated and corrected. Some specific examples were:

1. Condition report No. 99-5120 identified "mounting and conduit concerns," with a pressurizer pressure transmitter, but the report did not discuss what the concerns were. In addition, condition report No. 99-4298 documented a leak on the low pressure side of the No. 1-NLI-151 pressurizer level indicator, but the leakage was not quantified.

2. Condition report No. 99-4470 described foreign material identified in the Unit 1 refueling water storage tank. This report was initiated by the ESRR team reviewing the containment spray system and had been through the licensee's screening process. The team initiated the report after noting that this issue had been originally identified in 1997 in condition report No. 97-0879, but the associated investigation had failed to evaluate the condition of the Unit 2 tank or the emergency core cooling system pumps (which draw from the refueling water storage tank). However, the inspectors identified that neither the team nor the screening staff had addressed the potential impact of the tank debris on the reactor fuel. Because this tank is used to fill the reactor vessel with borated water during refueling activities, it was possible for debris to be entrained in the vessel, potentially damaging reactor fuel during power operation.

3. Condition report No. 99-5083 described several deficiencies with tubing associated with the Unit 2 reactor coolant pump oil collection system. These deficiencies were identified by the reactor coolant system ESRR team and included several examples of tube kinking which could impede oil flow. In the report, the team concluded that the "oil collection system was still capable of passing sufficient oil flow," but the report did not provide a basis for operability. The System Manager stated that this conclusion was based on his expert opinion, but that he had written the report so that a more formal operability evaluation could be performed. The inspectors were concerned that the condition report as written, may not have resulted in the desired action.

Licensee management agreed with the inspectors' observations and stated that the teams were not meeting the expectations stated in Step 6.3 of Procedure No. 12 PMP 7030.INT.001 (Revision 2), "Corrective Action Initiation." Briefly, these expectations were that the author address, in part, potential generic implications, other systems affected, and potential consequences if known, and clearly state the expected corrective action. The author should also provide sufficient information about the issue to ensure that the investigation addresses the author's intent. The licensee planned to issue additional guidance on these expectations to the ESRR teams.

Of more significance, were two examples where the inspectors identified that the specific design requirements were not considered during condition report disposition. Specifically, report Nos. 99-04685 and 99-05271 identified bows and bends in reactor coolant system instrument tubing but lacked any description of the measured extent of tube bowing or

bending. For report No. 99-04685, the lack of a detailed description may have contributed to closure of the issue without an adequate technical basis. Specifically, the tube bend/bow was not verified against sloping and minimum bend radius requirements (Section E3.1.b.7) prior to deciding to correct this issue following plant restart. While this issue had been properly dispositioned during the condition report close-out process, the licensee manager for the corrective action program acknowledged that this condition report contained minimal description of the issue and that no explicit technical criteria had been applied to the damaged tubing. The inspectors were concerned regarding the failure to apply the specific design requirements in the disposition of nonconforming conditions. Revised corrective action program and implementing procedures were recently issued and will be reviewed during future inspections.

b.4 Refurbishment Schedule of 4000 and 600 Volt Breakers

The inspectors noted that the ESRR process was effective in identifying significant issues, such as the failure to perform proper maintenance of some safety-related 4kV breakers. The licensee recently performed a maintenance history review of metal-clad breakers and concluded that evaluations of industry operating experience had not been adequately performed in the past. However, the inspectors were concerned that the licensee had not refurbished some of the breakers since the initial plant startup and had not followed vendor recommendations to refurbish the breakers on a maximum ten year interval. In 1989, the licensee experienced several failures of the 4kV breakers due to hardened grease in the operating mechanism. However, the licensee only refurbished 18 of the 32 4kV (per unit) safety-related breakers. The licensee stated that safety-related breakers that were required to close during an accident were refurbished in 1989. None of the 600V metal-clad breakers were refurbished at that time.

On March 9, 1999, the licensee issued condition reports 99-04846 and 99-4846 to investigate corrective actions. The licensee's ESRR T-Bus team was given the task of reviewing the maintenance and operations of the 4kV and 600V breakers. This included review of maintenance procedures, industry experience and vendor technical information to be used to establish a switchgear maintenance program. In addition, the licensee assembled a separate team at the plant to establish schedules and involve the manufacturer in the refurbishment of the breakers. The licensee planned to refurbish all the Unit 1 and Unit 2 safety-related 4kV breakers prior to restart. The licensee's plan for refurbishment of the 600V breakers was still under development and no decision had been made to refurbish the 600V breakers prior to restart.

b.5 Lack of Molded Case Circuit Breakers (MCCBs) Testing

The inspectors were concerned that the licensee had not tested safety-related MCCBs since 1972. As part of the ESRR reviews, the licensee stated that the ESRR T-Bus team would be reviewing maintenance of the MCCBs in conjunction with industry operating experience but that the reviews were still in progress.

The inspectors noted that licensee had not tested all of safety-related breakers since the plant became operational in 1972. The inspector reviewed the licensee's evaluation of information notices (INs) 93-26, "Grease Solidification Causes Molded Case Breaker Failure to Close," and 93-64, "Periodic Testing and Preventative Maintenance of Molded

Case Circuit Breakers," that described failures of MCCBs. The licensee's evaluation of IN 93-26 was not comprehensive and addressed the narrow issue of the type of breaker mentioned in the IN. The evaluation of IN 93-64 was more comprehensive and the licensee recognized the need to test the MCCBs and an internal commitment was made to test a 10 percent sample of safety-related MCCBs. However, according to the electrical engineering supervisor this internal commitment was not implemented. This was considered as another example of the previously identified programmatic breakdown of the corrective action program.

The ESRR reviews were still ongoing and the licensee had not made a decision to test MCCBs. The inspectors will review this area in future inspections.

b.6 No Documentation to Indicate Nonconforming MCCBs Were Replaced

During review of MCCBs, the inspector noted that the licensee committed to replace 100 breakers under Bulletin 88-10, "Nonconforming Molded Case Circuit Breakers." The Bulletin discussed problems with defective refurbished MCCBs that lacked safety-related traceability. Since the licensee was unable to determine traceability of these breakers, the corrective action was initiated to replace 100 breakers. The inspector asked for documentation to show that the breakers had been replaced. The licensee found documentation to demonstrate that 50 of the breakers had been replaced. However, the licensee was unable to determine if the remaining 50 breaker were replaced.

The licensee identified the failure to follow up on NRC commitments to be a generic problem. As part of the ongoing reviews, each ESRR team was required to review and determine whether all commitments made to the NRC were implemented. The licensee stated that the review of this commitment had not been performed but would have been performed as part of the ESRR reviews. The licensee was investigating this issue to determine if the breakers were replaced with qualified safety-related MCCBs.

b.7 NRC Questions Prompt Identification of Conditions Adverse to Quality

The ESRR team that performed the walkdown of the reactor coolant system had identified "inappropriate bends" in instrument tubing and documented these conditions in condition report Nos. 99-04685 and 99-05271. The system manager was aware that instrument tubing should slope upwards from the detector to ensure that gas binding or entrapment does not impact instrument readings. However, the inspectors noted that the walkdown checklists did not include verification of slope during the system walkdowns. Consequently, the team did not verify or check for proper instrument slope.

The design criteria of 227440-STG-5400-03, "NEID Instrumentation Design Standards Details," Revision 1 and 227440-STG-5400-04, "NEID Instrumentation Design Standards," Revision 0, for instrument tubing slope and minimum bend radius were not included on the as-built instrumentation drawings. As a consequence, none of the team members knew the design criteria for the required amount of tubing slope (1/8 inch minimum per foot) nor the minimum bend radius (3 tubing diameters) for instrument tubing. The inspectors' review prompted one member of this team to reinspect the instrument lines for the correct slope. During this reinspection, 30 to 40 foot segments of instrument tubing were identified (condition report No. 99-6768) that were run horizontally

without an upward slope and several sections that appeared "wavy" between supports. This issue represented a lapse in the ESRR team's attention to the detailed design basis requirements in performing system reviews and walkdowns.

c. Conclusions

The licensee was effectively identifying system deficiencies through the expanded system readiness review process. Programmatic and technical concerns that were identified included cable separation, electrical breaker refurbishment, and seismic mounting. The threshold for identification of problems was conservatively low, with 80 to 100 condition reports per day being initiated by the expanded system readiness review teams. Examples were identified where issues could not be consistently dispositioned due to erroneous or missing information in the electronic database, or because limited or incorrect problem descriptions were documented in condition reports. In particular, design requirements were not considered during one condition report disposition, that resulted in an inspector-prompted concern with improper instrument line slopes. Collectively, these issues could result in problems not being properly resolved or prioritized.

E4 Engineering Staff Knowledge and Performance

E4.1 System Walkdowns

a. Inspection Scope (40500, 40501 and 93801)

Inspection Scope

The inspectors reviewed the walkdown strategies developed by the ESRR teams and also observed some of the walkdowns. The walkdown strategies were compared to the ESRR procedure and "System Walkdown Guidelines" in Attachment 7 of the ESRR procedure. The attachment provided general guidance for assuring that the walkdown would assess the conformance of the plant with design and licensing basis requirements. The guidelines also provided specific areas to be reviewed by the ESRR teams.

b. Observations and Findings

The inspector identified isolated problems in a generally effective walkdown process that complied with Attachment 7 of procedure No. PMP 7200.RST.004 (Revision 3) "Expanded System Readiness Review Program," which appeared to be accomplishing the goals of identifying system design and configuration deficiencies. However, a potential weakness in the preparation for system walkdowns was identified by the inspectors. The inspectors noted that ESRR teams had not performed reviews of system modifications prior to the initial system walkdowns. If a walkdown preparation step had required modification reviews, it could have prompted the ESRR team members to more closely focus on plant systems modified since initial construction.

b.1 Reactor Protection System (RPS)

On March 13, 1999, the inspectors observed the walkdown of portions of the RPS system. The inspectors identified that the walkdown plan lacked focus on design aspects of the system such as electrical separation criteria and verification of the elementary diagrams. The RPS team appeared to focus primarily on materiel condition. The team identified an incorrect terminal board wiring connection, but the team did not expand the inspection to include verification of the other RPS panels. In discussing the use of the elementary diagrams, the inspectors were not clear on what aspects of design and configurations were reviewed since team members were not given specific guidance as to which portions of the elementary diagrams were to be verified. The lack of initial focus on design elements during the walkdown indicated that more active management oversight may be needed to ensure effective walkdown results. The following observations were also noted:

- The RPS team did not initially take the correct plant system drawings into the field.

- Electrical separation for the four RPS channels was not discussed in the pre-job briefing and was not listed on the walkdown plan as an attribute to be inspected, even though the system matrix listed it as one of the attributes to be reviewed.

- The initial system readiness review walkdown did not appear to be incorporated in setting the scope of the ESRR walkdown, although required by Attachment 7 of the ESRR procedure.

- Control room instrument drawings associated with the RPS system were not taken into the field.

A second walkdown was subsequently performed, and based on discussions with the RPS system manager, the inspectors noted that many of the initial comments were resolved. For example, the inspectors noted that the second walkdown included a review of separation, incorporated the initial system readiness review walkdown, and did not appear to be mainly a review of materiel condition. However, Performance Assurance accompanied the team on the second walkdown and made the same comment about what elementary diagram and configuration attributes were being verified. The inspectors discussed this issue and the licensee stated that further guidance would be given to the teams to further define the aspects of design and configuration to be verified during the walkdowns.

b.2 Off-Site Power Distribution System

The inspectors observed the off-site power distribution ESRR system walkdown. The inspectors noted that the team followed the guidelines of Attachment 7 of the ESRR procedure. The pre-job briefing was acceptable and the walkdown checklists, developed by team, were comprehensive and contained specific attributes to be reviewed. The inspectors observed that the team focused on design specifications such as transformer tap setting, protective relaying settings, and grounding for lightning arrestors. The team, however, did not verify the elementary diagrams against the field configuration.

The team found a caution card in the 345 kV control house written in June 1976, that modified the field configuration from the drawing. The inspector observed that the drawing had not been updated. The team wrote a condition report to investigate this discrepancy. In the 765 kV control house, the inspector noted a similar caution tag written in August 1983, on a relay but the condition was not noted by the team. This problem was discussed with the system manager after the walkdown. The system manager stated that he was not able to enter the area during the walkdown because the team was prohibited from entering by the electrical operations department. The system manager indicated that there had been no plans to walk down the 765 kV control house but that the caution tag would be investigated.

b.3 Electrical Safety Buses (T-Bus)

The inspector discussed the T-Bus walkdown plan with the system manager. The inspector noted that the plan was well developed and comprehensive. The plan included design basis reviews for seismic consideration and electrical separation. The plan and walkdown, however, did not include reviews for configuration of the elementary diagrams against the field configuration and review of the protective relay setting on the switchgear. The licensee agreed that the failure to verify the protective relay setting was an oversight on part of the T-Bus team, and intended to revise the plan accordingly.

b.4 250 Volt Direct Current (VDC) System and Station Batteries

The inspectors discussed the 250 VDC walkdown plan with the system manager. The inspectors noted that the plan was well developed. The team verified design attributes such as electrical separation, elementary diagrams and fuse sizes. The inspectors noted, however, that the team had not included the ground detection system as part of the walkdown. The inspectors were informed that the ground detection system was planned for a subsequent walkdown.

b.5 Containment Spray System

On March 18, 1999, the inspectors attended the walkdown strategy meeting and observed the walkdown of the Unit 2 upper and lower containment spray system by the ESSR team reviewing the containment spray system. The Unit 1 containment and the auxiliary building had been reviewed earlier by the team. The team had developed a comprehensive list of attributes to review including those concerns identified during the prior ESRR walkdowns, the 1998 plant system readiness review process, and a March 1998, contracted safety system functional inspection of the containment spray system. The inspectors noted that the walkdown was performed consistent with Attachment 7 to the ESRR procedure including the use of the proper system drawings. Team members were aware of design requirements and identified several deficiencies which, collectively, raised questions regarding the ability of the containment spray system to perform as stated in the Final Safety Analysis Report. For example, the team identified numerous spray headers that were fully or partially blocked by light fixtures or other appurtenances which may result in less than the stated containment coverage. During the post-walkdown meeting, the system manager properly dispositioned these issues and verified that they would be documented in condition reports.

b.6 Reactor Coolant and Pressure Relief System

On March 10, the inspectors attended the walkdown strategy meeting and observed the walkdown of the unit 2 reactor coolant and pressure relief system. Specifically, the walkdown observed the condition of the reactor coolant pumps/motors, pressurizer, associated valves, reactor vessel head and associated components, and the steam generator bottom head valves. The undervessel area was not reviewed during this inspection. A detailed walkdown plan was developed addressing those attributes described in the associated system assessment matrix, and issues identified in earlier ESRR walkdowns and in the 1998 plant system readiness review. The walkdown was performed consistent with Attachment 7 and findings were properly dispositioned by the System Manager during the post-walkdown briefing. However, during a subsequent review of walkdown findings, the inspectors noted that some identified deficiencies were improperly characterized in the associated condition reports, and that team members did not appear to fully pursue and/or understand certain system design criteria. These issues are discussed in more detail in Section E3.1.

c. Conclusions

Overall, the system walkdowns appeared effective at identifying design and configuration deficiencies, as exemplified by the spray header blockage concern. Most walkdown teams used comprehensive checklists to verify design parameters such as electrical separation, protective relay settings, transformer tap settings, and grounding. However, isolated weaknesses were identified with specific walkdowns which initially appeared to focus on materiel condition instead of design attributes. Preparation steps for the expanded system readiness review walkdowns did not require the teams to review prior modifications. This was considered a potential weakness in the program because of previously identified programmatic deficiencies in the design control process.

E7 Quality Assurance in Engineering Activities

E7.1 Management Oversight of the ESRR Program

a. Inspection Scope (40500 and 40501)

The inspectors reviewed the effectiveness of the system readiness review board (SRRB) and the Performance Assurance (PA) group in providing management oversight of the ESRR process. The inspection consisted of observing board meetings, reviewing relevant documents, and interviewing workers.

b. Observations and Findings

b.1 System Readiness Review Board Oversight

The SRRB was responsible for performing a system-based, multi-disciplinary review of potential issues to ensure consistent application of the licensee's restart criteria. During this phase of the ESRR process, the SRRB was reviewing each team's System Attribute Matrix, which described the system's safety functions and those specific areas to be assessed.

The inspectors observed that a proper quorum was established in each SRRB meeting comprising those members listed in the SRRB charter (Attachment 1 to the ESRR procedure). In its reviews, the SRRB enforced technical rigor, consistency of approach, and identified generic issues of concern. Some specific examples included:

- The SRRB postponed approval of the system assessment matrix for the reactor protection system until after the responsible team had addressed technical issues identified during Board reviews on March 12, 18, and 23, 1999.

- The SRRB initiated a condition report (No. 99-4717) documenting an incident where an ESRR team presentation (i.e., the 250 VDC system) had not met management expectations.

- The SRRB (together with the PA group) identified a generic concern that system boundaries may not have been properly identified by or assigned among the ESRR teams. This concern was later documented in condition report No. 99-5664.

Overall, the inspectors concluded that the SRRB was appropriately performing its function as defined in its charter.

b.2 Performance Assurance Oversight

The PA group performed field observations of selected ESRR activities, which were periodically aggregated and issued as Surveillance Reports. The PA group consisted of three teams, one team was performing a broadscope review of the ESRR process, and the other two teams were performing specific reviews (comparable to the ESRR teams) of two selected systems. For this inspection, the inspectors limited their review to those activities being performed by the broadscope team.

To help maintain independence from the ESRR process, each auditor developed a listing of concerns prior to and during audited activities, which were withheld from the participants, pending the auditor's evaluation of how these concerns were addressed. Audit findings were typically communicated to the auditees within 2 days of the observations. The inspectors reviewed several field observations performed since February 1999. These observations covered an acceptable scope of ESRR activities and identified several technical and process concerns. In particular, the inspectors noted that ESRR management was reviewing the PA findings and was verifying that generic concerns, such as the system boundary issue (see section E7.1.b.1), were being addressed.

The inspectors observed auditors attending SRRB meetings and system walkdowns and discussed the conduct of the audit with the auditors. The inspectors noted during the first week of inspection that the PA group had not been initially involved with oversight of the ESRR walkdowns. The PA group had witnessed and issued one field observation in the first week of inspection. The involvement by PA increased substantially in the following two weeks.

c. Conclusions

Licensee management maintained good oversight of the ESRR process and was appropriately addressing identified issues. The System Readiness Review Board was performing activities consistent with its charter as defined in the ESRR procedure and was providing technical rigor and consistency to the individual ESRR teams. In addition, after adjusting their participation in the system walkdowns, the Performance Assurance group was maintaining an active, independent oversight role in the ESRR process.

E8 Miscellaneous Engineering Issues

E8.1 (Open) Non-Cited Violation 50-315/99002-01(DRS); 50-316/99002-01(DRS): The licensee had not maintained a recontact program with the Nuclear Steam Supply System (NSSS) vendors which could adversely affect the ESRR process. The three NSSS vendors for the licensee were Westinghouse, General Electric, and Asea Brown Boveri. The licensee had obtained updated information for 11 of the 15 Westinghouse systems being reviewed by the ESRR teams. The majority of the updated information was not critical to the ESRR process and was already in the licensee's possession, having been obtained, in part, during design reviews, vendor representative site visits, and part purchasing orders. The licensee was in the process of recontacting the other two NSSS vendors and developing a procedure to assure that all NSSS vendors were regularly recontacted. These actions were expected to be completed by the end of June 1999. This item will remain open pending the licensee's evaluation on the impact on the ESRR process for the remaining two NSSS vendors.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on March 26, 1999. The licensee acknowledged the inspection conclusions presented and did not identify any potential report material as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee
P. Barrett, Performance Assurance Director
D. Cooper, Plant Manager
R. Eckstein, Engineering Restart Director
T. Esper, Licensing
M. Finissi, Plant Engineer
D. Garner, Plant Engineer
R. Huey, Performance Assurance
B. Kalinowski, Performance Assurance
D. Kosloff, Licensing
R. Powers, Senior Vice President
W. Shafer, Licensing
L. Thornsberry, Engineering Restart

US NRC
B. Bartlett, Senior Resident Inspector
B. Fuller, Resident Inspector
J. Maynen, Resident Inspector

INSPECTION PROCEDURES USED

IP 93801:	Safety System Functional Inspection
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 40501:	Licensee Self-Assessments Related to Team Inspections

ITEMS OPENED, CLOSED, AND DISCUSSED

ITEMS OPENED - None

ITEMS CLOSED - None

ITEMS DISCUSSED

50-315/99002-01	NCV	Failure to establish an NSSS vendor recontact program
50-316/99002-01	NCV	Failure to establish an NSSS vendor recontact program

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
ESRR	Expanded System Readiness Review
IN	Information Notice
MCCB	Molded Case Circuit Breaker
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
PA	Performance Assurance
RPS	Reactor Protection System
SRRB	System Readiness Review Board
VDC	Volt Direct Current

PARTIAL LIST OF DOCUMENTATION REVIEWED

Procedures:

PMP 7200.RST.004, Revision 3	Expanded System Readiness Review Program
PA 99-S06, Revision 1	Performance Assurance Department Audit Plan
12 PMP 7030.INT.001, Revision 2	Corrective Action Initiation
PMI-7030, Revision 25	Corrective Action Program

Condition Reports:

CR-99-4843	"Balance of plant metal-clad breakers that have been refurbished since 1990 do not meet 1999 EPRI standards"
CR-99-5419	"Breaker 2-EZC-A-2B tripped when AC power was applied to 2-BC-AB1 battery charger"
CR-99-4269	"Temporary lubricant was used on 4kV breakers requiring full relubrications; however, there was no documentation to indicate this was performed"
CR-99-4849	"Perform a search on metal-clad breakers to determine the industry operating experience that have been outside normal operations"
CR-99-4850	"Research of metal-clad breakers indicated an adverse trend that found balance of plant breakers used in safety-related applications"
CR-99-4846	"It was determined that there was a lack of confidence that internal and external industry notices had been reviewed for metal-clad breakers"
CR-99-4298	"1-NLI-151 Pressurizer level indicator has leak on low pressure side"
CR-99-4685	"Instrument line is bent inappropriately"
CR-99-5120	"2-NPS-153, Pressurizer pressure transmitter has mounting and conduit concerns"
CR-99-5131	"2-NLI-151 has external corrosion and tube routing concerns"
CR-99-5271	"The tubing from 2-NFP-230-V1 has a significant bow downward in it"
CR-99-6768	"The instrument piping to the transmitters in the instrument room do not appear to have a slope"
CR-99-6774	"Steam generator tube plugging has been accomplished without a design change"
CR-99-5664	"The Performance Assurance Vertical Slice teams noted a generic concern with ESRR system boundary selection and control"

CR-99-4717	"The 250 VDC System Manager modified the ESRR Attribute Matrix outside the bounds of the procedure PMP 7200.RST.004"
CR-99-5083	"The reactor coolant pump oil collection system is kinked in several locations"
CR-99-4470	"In 1997, debris was found in the Unit 1 Refueling Water Storage Tank. No inspection shave been completed to determine if debris is present in the Unit 2 tank."
CR-99-4490	"Foreign Material Found in Unit 1 East Containment Spray System Heat Exchanger"
CR-99-4685	"The instrument tubing from 1-NFP-242-V2 is bent, but does not appear to be kinked about 6 inches from the valve."
CR-99-5271	"The tubing from 2-NFP-230-V1 has a significant bow downward to it"
CR-99-6000	"1-IMO-202 and 1-IMO-204 are painted blue. The expectation is that Unit 1 valves are to be painted orange and Unit 2 valves blue"
CR-99-03429	"The containment spray system description discusses that 1M0-215, 225 are closed by operators whenever the residual heat removal system is placed in service. This is inaccurate."
CR-99-4571	"Operations Flow Diagram Drawings OP-1-5144-31 and OP-2-5144-40 level elevations are in disagreement with ECP 1-2-I9-03, revision 6"
CR-99-5208	"The 2-RC-138, RVLIS isolation valve has a significant build-up of boric acid on it that my have contacted the Reactor Vessel Head"
CR-99-5212	"Undesirable material condition of the Reactor Vessel Head Area"
CR-99-5921	"The fraction of containment sprayed assumed in the off-site and control room calculation is not conservative"
CR-99-4921	"Inappropriate drawings were originally selected for use in ESRR reactor protection walkdown"
CR-97-2170	"Unacceptable maintenance rule performance of the unit 1 train A electrical safety buses"

Performance Assurance Field Observations:

FO-99-B-002	"SSRB Review of Reactor Coolant System Attribute Matrix"
FO-99-C-005	"Vertical Slice Review of Essential Service Water Matrix"
FO-99-C-008	"Classification of Reactor Coolant System Team Walkdown Discrepancies"
FO-99-B-011	"Essential Service Water System Walkdown"
FO-99-C-019	"Supervisory Oversight of ESRR Process"
FO-99-B-30	"SRRB Presentation of Containment Spray System"
FO-99-C-026	"ESRR Re-review of the Reactor Protection System Attribute Matrix"
FO-99-C-024	"Reactor Protection System Walkdown by the ESRR team conducted on March 23, 1999"
FO-99-B-037	"SRRB Meeting on Essential Service Water System Attributes"
FO-99-B-105	"SRRB Review of the Reactor Protection System Attribute Matrix"
FO-99-B-106	"ESRR Containment Spray Systems Unit 1 and 2 Walkdown"

System Readiness Review Board Meeting Minutes:

Meeting No. 99-011	"Review of the System Readiness Review Matrices for the Reactor Coolant System, the 120 VAC Vital Buses, and the CRID Inverter"
Meeting No. 99-013	"Review of the Component Cooling Water and Shutdown Cooling Systems"

Meeting No. 99-012 "Review the Containment Spray System Attribute Matrix"
Meeting No. 99-021 "Review of the 250 VDC Station Batteries"
Meeting No. 99-024 "Review the Reactor Protection System/Engineered Safety System Attribute Matrix"
Meeting No. 99-028 "Re-review of the Reactor Protection System/Engineered Safety System Matrix"

Minutes of a February 23, 1999, informal SRRB meeting to perform a dry run review of the Expanded System Readiness Review of the Reactor Coolant and the Emergency Core Coolant Systems.

Engineering Standards:
227440-STG-5400-03, "NEID Instrumentation Design Standards Details," Revision 1
227440-STG-5400-04, "NEID Instrumentation Design Standards," Revision 0

Miscellaneous:

March 1998, "Safety System Functional Inspection of the D.C. Cook Units 1 and 2 Containment Spray System," by Duke Engineering Services

The approved ESRR System Attribute Matrices and the 1998 System Readiness Review Results for the following systems (both Units 1 and 2 unless otherwise indicated) were reviewed during this inspection:

- Containment Spray
- Reactor Protection Solid-State Protection System and Engineered Safety Features System Actuation
- Reactor Coolant System
- 250 VDC Station Batteries
- T-Bus