Indiana Michigan
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315/89-31

INDIANA MICHIGAN POWER

AEP:NRC:1125A

Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
NRC INSPECTION NOS. 50-315/89031 AND 50-316/89031:
RESPONSE TO VIOLATION

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Attn: A. B. Davis

April 11, 1990

Dear Mr. Davis:

This letter is in response to Mr. H. J. Miller's letter dated March 1, 1990, which forwarded the report on the special maintenance team inspection conducted by Mr. Z. Falevits and others of your staff. This inspection was conducted from December 4 through 8, and December 18 through 22, 1989, on activities at the Cook Nuclear Plant associated with the support and implementation of maintenance to ensure that plant structures, systems and components reliably perform on demand. The Notice of Violation attached to Mr. Miller's letter identified six weaknesses and four Severity Level IV violations relating to our maintenance program. The weaknesses are addressed in Attachment 1 to this letter. The violations are addressed in Attachment 2 to this letter. A 14-day extension for our response was granted on March 15, 1990.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Sincerely,

M. P. Alexich
Vice President

ldp

Attachments

31 pp

IE01
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cc: D. H. Williams, Jr.
A. A. Blind - Bridgman
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman
NFEM Section Chief

ATTACHMENT 1 TO AEP:NRC:1125A

RESPONSE TO NRC-IDENTIFIED WEAKNESSES

NRC-Identified Weakness (1)

"Lack of or ineffective action to correct numerous self identified maintenance problems identified in February 1988, many of which were identified by the team during this inspection."

Response to Weakness

(1) Corrective Actions Taken

As a result of the 1988 Maintenance Self-Assessment Report, AEPSC contracted IMPELL to assist in identifying and formulating appropriate corrective actions to address the self-identified deficiencies. The results of this effort are in a document entitled, D. C. Cook Plant PM Program Upgrade Strategy Document, dated November 1988. This study contained a strategy for AEP to accomplish a planned upgrade of the Preventive Maintenance (PM) Program at the Cook Nuclear Plant. It identified reasonable goals and achievable objectives for the PM Upgrade Program based on AEPSC/Cook Nuclear Plant philosophy, resources and capabilities. The specific implementation tasks and strategic considerations were presented for obtaining the desired upgrade results. This effort not only addressed improvements in the PM Program itself, but also examined related organization and automation requirements to support the improved PM Program. Based on the results of this study, numerous corrective actions were initiated in January 1989.

The first was the initiation of a reliability-centered maintenance (RCM) program. This major task has two phases: analysis and implementation.

AEPSC has been working closely with General Physics on the analysis portion that will form the foundation of the RCM program. This work includes:

- o defining system boundaries and functions
- o identifying dominant failure modes
- o determining critical failure modes and critical components
- o identifying applicable and effective preventive maintenance tasks to prevent failures
- o completing analysis of selected plant systems

Implementation of the RCM Program began in August 1989 with the development of plant procedures, identification of system boundaries, and establishment of an RCM database. The first system analysis was completed in February 1990 on the feedwater system. Analysis of 22 additional plant systems/functional areas will take place over the next three years.

Another outgrowth of the Maintenance Self-Assessment Report and the AEPSC/IMPELL study was the development of the System Engineer Program. The goal of the System Engineer Program is to provide training to enable individuals to provide the engineering expertise required for safe, efficient and reliable operation of systems for which they are responsible. The System Engineer discharges this responsibility by performing assigned tasks, and maintaining cognizance of all work associated with the assigned system(s).

In addition, AEPSC contracted TENERA Systems and Software to provide a computerized maintenance management information system. This system, referred to as the Nuclear Plant Maintenance Module (NPM) System, discussed in more detail in our response to weakness (3), will allow plant staff to initiate, issue, prioritize and track all maintenance work at the plant. This same software is currently being used at Pacific Gas and Electric's Diablo Canyon, and Public Service Electric and Gas's Salem and Hope Creek Generating Stations. In addition, it was recently chosen by Electricite de France for use in all fifty of its nuclear plants.

These three programs, RCM, System Engineer and NPM, are just part of the actions that are being taken to respond to the Self-Assessment. The November 1989 reorganization of Cook Nuclear Plant's management is another important element in the upgrade of our maintenance program. The intent of the new organization is to place emphasis on maintenance, outages, and human resources.

Other actions, which have or are being taken are as follows:

- An AEP and Cook Nuclear Plant policy on maintenance was developed and approved in December 1989 by AEP senior management. An additional plant-specific maintenance policy established in accordance with INPO guidelines is being developed to clarify maintenance philosophies and responsibilities for all maintenance groups

- Corporate reviews have been conducted, which have resulted in improvements being made to shop areas used by the maintenance groups

- Staffing studies are being performed, which have already resulted in an increase in the number of engineers and radiation protection technicians on site.

- Other programs of note that address maintenance self-assessment findings include the maintenance procedure rewrite (See Weakness (6)), the long-range plan and the outage guideline development plan.

(2) Benefits To Be Derived From Corrective Actions

RCM, the System Engineer Program and NPM were initiated to address many of the Maintenance Self-Assessment's identified deficiencies. When all of our efforts have been completely implemented, each of the major findings of the self assessment will have been addressed.

As a result of these corrective actions we anticipate having a state of the art maintenance program which will result in improved plant safety, reliability and accountability.

(3) Date When Benefits Will Be Realized

As previously stated, we started the RCM Program in August 1989. However, we anticipate that the program will not be completely implemented for all the critical plant systems until the end of 1992. As each system is analyzed, benefits will be realized so that when this program is completed we will have a fully integrated preventive maintenance program.

The System Engineer Program, like RCM, is still in the early stages of implementation. A document which clearly delineates the responsibilities of the engineers is currently in the final stages of review and approval.

AEPSC's acquisition of TENERA's NPM system was approved in December 1989. However, it will not be in place and operational until August 1990, when data will be entered.

We will be conducting QA audits or surveillances to access the status and effectiveness of some of our corrective actions as they develop. In addition, the Maintenance Improvement Plan will review and resolve, as appropriate, the Maintenance Self-Assessment items. The Improvement Plan includes milestones and a built-in mechanism that requires regular re-evaluation.

While we are already realizing benefits from our efforts, we do not anticipate the full benefit for several years. In order to effectively implement programs as encompassing and comprehensive as these, significant analysis, planning and coordination are needed. As a result, their benefits will not be fully realized until mid 1993.

NRC-Identified Weakness (2)

"An ineffective preventive maintenance program that resulted, for example, in failures of 4KV circuit breakers"

Response to Weakness

We concur that the Preventive Maintenance Program can be improved and, as previously discussed, we are taking steps to do so. However, Cook Nuclear Plant's availability in 1989 is evidence that the present preventive maintenance program is effective. During 1989, Cook Nuclear Plant generated 12 million net MWHRS, the most since 1984. The 69.3% availability for Unit 1 in 1989 contributed to an average availability of 79.4% since 1985. Although Unit 2 overall availability has not been as high due to steam generator tube degradation, its 74.4% availability in 1989 was the highest since 1983.

On December 8, the 111-day record for the longest run with both units operating was broken. This record was extended to 140 days when Unit 2 was brought off-line for a surveillance outage on January 6, 1990.

Unit 1 ended 1989 with its longest run of 175 days and continued operating until March 17, 1990 (a Cook Nuclear Plant record run of 251 days) when the unit was brought off line for a planned surveillance outage.

As discussed in our response to NRC violation (2) of the inspection report, the 4KV circuit breakers failure was detected during preventive maintenance testing. As a result, appropriate corrective action was subsequently taken which resulted in improvements to our 4KV breakers. Also, we notified the industry of the problem via a Part 21 report.

NRC-Identified Weakness (3)

"An extensive backlog of non-outage corrective maintenance job orders partly caused by lack of integrated planning and scheduling methodology."

Response to Weakness

Maintaining the Cook Nuclear Plant involves the completion of approximately 20,000 Job Orders annually. The relative priorities of jobs change frequently due to a number of factors, the primary reason being plant conditions. Managing the information contained within the backlog of yet-to-be completed Job Orders can be critical to plant availability and reliability. These efforts are presently hampered by the logistics of paper filing systems and computer tracking systems that lack needed flexibility in hardware and software.

(1) Corrective Actions Taken

The Cook Nuclear Plant Information Management System (IMS) plan, approved for development in February of 1989 identified nine computer system modules that, when completed, will form a single, integrated information management system. This automated information system will be used by both plant site and corporate personnel to support plant operation and maintenance. It will provide for the scheduling and initiation of maintenance tasks and support the assignment of responsibilities and accountabilities for these tasks.

Specifically, for maintenance, the Nuclear Plant Maintenance Module (NPM) of the Cook Nuclear Plant's IMS plan will allow plant staff to initiate, issue, prioritize, and track all maintenance work at the plant. The NPM module of the IMS plan will also maintain a history of maintenance work. The primary objectives of the NPM module are to improve plant availability and to optimize the use of plant resources with the overall goal of reducing plant maintenance.

The NPM system is designed to allow any NPM user to initiate a structured request that the user believes should be reviewed and, if warranted, acted upon. This action request feature provides a process for screening those actions requiring work, and will serve as a focal point for initiating and tracking Job Orders. Plant personnel will enter data into the NPM system defining the component that needs work and briefly describing that work. The system is designed to eliminate all paper in this process except the actual Job Order itself.

The reviews that take place in the Job Order system are performed on-line. This on-line capability allows for pending Job Orders to be sorted in various ways and the reviewing individuals have immediate access to this information. Once reviews are performed the actual Job Orders can be printed for the work to be performed.

Once a Job Order has been initiated, starting from the very first entry into the system and not just from the time it gets printed, the Job Order processing system can track the status of the Job Order. This is accomplished through the use of status code fields. Some of the codes represent situations such as waiting for materials, or waiting for approval of the reviews, or other types of conditions. This feature is very helpful for planning and scheduling the many Job Orders in the system.

The NPM system will permit the plant staff to assign specific Job Orders, at the activity level, to a scheduled date, crew and supervisor. Upon completion of the crew assignments and confirmation of permit requirements, the system produces a supervisory assignment report and prints the Job Order. The completed work package includes the Job Order, equipment descriptions, parts list, and testing forms along with other needed documents.

Once the work related to a Job Order has been completed and tested, the Job Order is reviewed and closed out, on-line. The NPM system maintains a complete history of all completed and closed-out Job Orders. This feature allows for rapid access to all history on Job Orders. The NPM system prevents a Job Order from being closed-out until all reviews and tests have been completed.

In addition, the NPM system will be a repository for previous repetitive tasks. This function eliminates the need for individuals to recreate Job Orders that are repetitive in nature. The NPM system will automatically generate the Job Orders, according to the appropriate due dates, or as directed by a planner.

The NPM system will also provide for continuous monitoring of surveillance tests and preventive maintenance work to meet regulatory or plant requirements.

Once the repetitive or preventive maintenance Job Orders are created, they are available for reviews and executions in the same manner as any of the other Job Orders. This system will also be used to develop Job Orders for planned outages such as refueling outages.

(2) Benefits To Be Derived From Corrective Actions

The data entered into the NPM system, and the processing that the system does with this data, will eliminate the multiple manual data entry steps of our present process. Eliminating redundant manual systems is of significance itself. However, more importantly are the anticipated improvements in plant availability and labor productivity.

Along with improved ability to plan and schedule work comes an increased amount of time available for more careful consideration of other aspects of the work to be performed, for example, personnel safety. Improvements can be expected and will certainly be strived for.

The NPM system will also identify and coordinate maintenance on related equipment and systems, thus decreasing down time on components removed from service. Quick access to the information in the NPM data bases makes the supervisors in both the operations and maintenance areas more aware of Job Order progress.

It is anticipated that the NPM system will help us realize our goal of a non-outage corrective maintenance job order backlog not in excess of 90 days.

(3) Date When Benefits Will Be Achieved

We currently anticipate having the computerized automated maintenance system in place and operational by August 1990. At that time, data validation and loading, procedure changes and training of personnel will begin.

NRC-Identified Weakness (4)

"Poor material condition especially as evidenced by the high number of oil, steam and water leaks."

Response to Weakness

(1) Corrective Actions Taken

While it is AEPSC's policy to keep all of its facilities, in good material condition, we recognize the need for improvement in this area. As a result, the management of the Cook Nuclear Plant has launched a concerted effort to improve plant material condition. This is evidenced by the allocation of funds to support the following physical improvements that are currently taking place:

- Auxiliary building painting
- Contaminated equipment storage area expansion
- Decontamination area redesign
- Improved lighting
- Installation of 18 personnel whole body contamination monitors

It is Cook Nuclear Plant policy that no leak is considered acceptable. Consequently, during the 1988/1989 refueling outages we refurbished about 1,780 valves and packed them with Chesterton packing. A breakdown of this effort is as follows:

	Unit 1	Unit 2	Total
Auxiliary Building	254	250	504
Containment	130	150	280
Turbine Hall	225	700	925
Miscellaneous	21	50	71

Nevertheless, a substantial number of leaks still exist in the auxiliary building, ranging from small traces of dried boric acid to dripping. These leaks have been entered into a computer data base, have been walked down, and job orders have been written. The leaks are currently being prioritized and efforts will be made to repair them during the next refueling outage, if not before.

The plant manager has reaffirmed his commitment to good plant material condition and personal accountability by sending a memorandum to each employee. This commitment has been supported by continued radiation worker awareness training, and operator training on venting and draining. In addition, decontamination efforts continue, which have already reduced the contaminated area from approximately 45,000 feet^2 in 1986 to the current 25,000 feet^2 (excluding laydown areas). Our goal is to reduce these contaminated areas to 20,000 square feet in 1990 and 10,000 square feet prior to the outage in 1991.

(2) Benefits To Be Derived from Corrective Actions

There are numerous benefits gained from having the plant in good physical condition, the most important of these being increased plant safety and reliability. A related benefit is improved radiation protection and worker safety. However, another important, but less quantifiable benefit is the improvement to worker morale.

(3) Date When Benefits Will Be Realized

While maintaining the plant in good physical condition is an ongoing process, we anticipate major improvements within the next year. The refueling outage will facilitate the refurbishment of valves, as well as other repairs and modifications.

NRC-Identified Weakness (5)

"Inadequate trending, root cause analysis and action to correct, for example, numerous leaking safety relief valves."

Response to Weakness

(1) Corrective Actions Taken

This weakness is being addressed by three programs: the NPM system which is discussed in detail in our response to weaknesses (1) and (3), the System Engineer Program, discussed in our response to weakness (1), and the RCM Program discussed in our response to weakness (1).

(2) Benefits To Be Derived from Corrective Actions

The NPM system will provide for a complete component history. The component history will provide a chronological listing of work, modifications or inspections that have been performed on a particular component. This process creates an indexed historical record for components or functional equipment groups and catalogs completion dates, failure codes, as-found and as-left conditions, parts replaced, test results, etc.

The System Engineers are expected to identify and trend appropriate system parameters, with the goal of obtaining pertinent data for system performance and reliability monitoring. The parameters trended shall be periodically reviewed and approved to allow timely preventive or corrective actions to be implemented.

Based on the trended data, the System Engineer is expected to recognize significant system/component degradation or abnormal operating conditions from both a historical basis, as well as current status. The System Engineer may require the support of technical experts to analyze specific areas of concern and will work closely with our Corporate Nuclear Engineering Division engineers in this regard.

The System Engineers are expected to perform root cause analyses on the systems assigned. Consequently, the System Engineers will be trained in root cause analysis.

In addition, the System Engineer is expected to:

- Evaluate system/component failure impact on plant safety and unit power operations
- Prepare and perform special system/component performance tests.

The RCM Program will contribute to resolving this issue by identifying dominant failure modes and critical components.

(3) Date When Benefits Will Be Realized

As previously stated, we expect the NPM system to be in place and operational in August 1990. At that time, personnel training and data loading will begin.

Several system engineers have been assigned at Cook Nuclear Plant and benefits have already been realized from this program. An effort is currently being made to recruit System Engineers. However, we anticipate it will take at least a year before the program is fully staffed.

NRC-Identified Weakness (6)

"In several instances procedures were not followed, were poor or did not exist especially in the balance of plant area."

Response to Weakness

(1) Corrective Actions Taken

Key to the safe and efficient operation of any nuclear power plant is strict adherence to procedures. As such, employees are shown during the Nuclear General Employee Training (NGET) classes, a videotape of David Williams, Jr., Senior Executive V.P., Engineering and Construction, mandating the adherence to procedures. It is AEPSC's long-standing policy that failure to follow procedures will result in disciplinary action.

In order for this policy to have any benefit, well-written and accurate procedures must be in place. Consequently, AEPSC is purchasing PRONET and the services of consultant procedure writers to upgrade or write 690 maintenance procedures (268 maintenance, 422 I&C).

Critical balance of plant components will be addressed as they arise in the RCM program.

The Maintenance Improvement Plan provides guidance that clearly defines what procedure compliance is. In addition, a procedure writer's/user's guide will address the circumstances for changing a procedure to ensure procedural compliance.

(2) Benefits To Be Derived from Corrective Actions

PRONET is a state of the art computer system that integrates writer's guidelines, word processing, graphics and data base functions into a centralized procedure management system. Development, commitment, scheduling and reporting functions will be controlled by this menu-driven network. This integrated approach will result in a program that reduces development time and provides efficient long-term procedure maintenance and commitment/reference tracking.

(3) Date When Benefits Will Be Realized

Although a consultant will train plant staff on the use of PRONET, the bulk of the procedure upgrade work will be performed by consultant personnel. By using contract workers we will not impact the plant staff. If the existing staff were used, it is anticipated that the effort would take four to five years. This is considered to be an unacceptable time frame for this work. By using contract workers, we will obtain professionally prepared procedures in a reasonable time frame. The effort is scheduled to be completed by December 1991.

ATTACHMENT 2 TO AEP:NRC:1125A

RESPONSE TO NRC-IDENTIFIED VIOLATIONS

NRC Violation 1

"10 CFR 50, Appendix B, Criterion V, as implemented by Section 1.7.5 of the Donald C. Cook Nuclear Plant Operational Quality Assurance Program requires that activities related to quality be prescribed by documented instructions, procedures, and drawings, that those activities be accomplished in accordance with those instructions, procedures and drawings, and that instructions, procedures or drawings include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

a. Procedure PMI-2290, "Job Orders," Revision 8, required in Sections 4.4.8 and 4.4.8.3 that upon completion of the physical work, the job order tags be removed and discarded. Contrary to the above, tags 15119, 029643, B012209, B016950, B016832, and B017240 were not removed although the job orders were cancelled or completed. As a result, status of equipment condition remained indeterminate (315/89031-01A; 316/89031-01A).

b. Request For Change 12-2180 required installation of 200% overload motor protection and that the thermal overload be set at the low trip current rating. Contrary to the above, on December 19, 1989, the inspectors observed that the thermal overload heater associated with residual heat removal loop isolation motor-operated valve ICM-111 was set at the high trip current rating. Numerous additional thermal overloads in the diesel generator motor control center were also observed to be the wrong size or set at the wrong current rating, which will result in premature removal of operating voltage from the motors (315/89031-01B; 316/89031-01B).

c. Procedure PMI-2030, "Document Control," Revision 10, failed to include requirements for the Master Drawing Indexes to be reviewed by intended users for the latest as built drawings located in the plant master file. Consequently, drawings issued by the document control center for field verifications were not the latest as built drawings or revisions (315/89031-01C; 316/89031/01C).

d. The "Pump Operator's Data" manual and the vendor manual for the Auxiliary Feedwater (AFW) pump required that the pump packing be adjusted while the pump is operating. Contrary to the above, this requirement was not incorporated into the AFW maintenance procdures [sic]. Although no problems were noted, inadequate attention to this requirement could result in rotor seizure, scored shaft sleeves, or burned packing (315/89031-01D; 316/89031-01D).

e. Procedure 12 THP 6030 IMP.014 "Protective Relay Calibration", Revision 8, Step 8.1.2-2 specified that black electrical tape be used when cleaning the disk and drag magnet mechanism on Time Overcurrent (IAC) relays. Contrary to the above, on December 5, 1989, a technician was observed using an unused calibration sticker to clean the 2AB EDG Time Overcurrent test relay. As a result, cleanliness of the contacts was questionable (315/89031-01E; 316/89031-01E).

f. Procedure PMI-2010 "Plant Manager and Department Head Instructions, Procedures and Index," Revision 17, Policy Statement 3.1, Section 3 required that "double asterisked" procedures for plant activities be "in-hand" when implementing the procedure. Contrary to the above, on December 6, 1989, the inspector observed an operator rack in "2A" Train Reactor Trip Bypass Breaker without having "in hand" double asterisked procedure **12-OHP 4021.082.018 "Racking In and Out Reactor Trip, Reactor Trip Bypass and MG Set Output Breakers," Revision 2. Even though no adverse affects were noted, in the past under similar circumstances, a reactor trip occurred (315/89031-01F; 316/89031-01F).

g. Procedure PMI-2010, "Plant Manager and Department Head Instructions, Procedures and Index," Revision 17, requires in Section 3.14.1 that all effective instructions and procedures be reviewed no less frequent than once every two years. Contrary to the above, maintenance procedure MHI 2070, MHI 7090, PMI 4050, 12 THP 6030 IMP.071, and 12 THP IMP.062 were not reviewed in the last two years. As a result, the procedures were not updated to reflect feedback and changes to preventive maintenance activities (315/89031-01G; 316/89031-1G)."

Response to Violation 1a

Plant procedure PMI-2290 requires that tags placed at or near equipment needing repair be removed when the item is repaired or if the Job Order is cancelled. As noted in the text, six Job Order tags were found in the plant for work that had been cancelled or completed which constitutes failure to follow procedure. The conclusion made in Inspection Report 89031 was that equipment status was "indeterminate." While the presence of Job Order tags was contrary to the requirements of PMI-2290, the status of equipment/components involved would not be affected. The information placed on a tag identifies to personnel 1) that a Job Order has been written for repair with number noted, 2) the nature of repairs/adjustments required as determined by the person initiating the Job Order and 3) helps locate the specific component. By itself, a Job Order tag has no impact on system or equipment operability, does

not indicate that equipment has been tagged out, and does not direct any other activity involving the equipment. Other systems such as the clearance permit system logs and the deficiency logs indicate the equipment status.

(1) Corrective Action Taken and Results Achieved

Job Order tags identified during the inspection were subsequently removed to achieve compliance with applicable sections of PMI-2290.

(2) Corrective Action Taken To Avoid Further Violation

The Plant Manager will issue a memo on procedural compliance to ensure that all personnel are fully aware of the meaning of compliance, consequences of failure and what actions to take when a procedure cannot be followed as written. The Maintenance Improvement Plan includes issuance of a department policy on procedure compliance. Included will be guidance on the monitoring of the effectiveness of procedure compliance. Also a procedure writer's/user's guide will address the circumstances for changing a procedure to ensure procedural compliance.

(3) Date When Full Compliance Will Be Achieved

The final draft of the policy will be issued on July 15, 1990. Guidance on the effectiveness monitoring will be issued on August 15, 1990. The Plant Manager's memo will be issued on May 1, 1990.

Response to Violation 1b

The Notice of Violation identified that thermal overloads in the plant had been installed at an incorrect trip current rating. As a result of the inspection, plant personnel investigated the problem and addressed it in Problem Report 90-81.

(1) Corrective Action Taken and Results Achieved

The improper positioning and/or mis-sizing of the overload heaters resulted from errors made during initial installations. Twenty overloads were inspected and evaluated by plant and AEPSC engineers. Eleven were found to be correct. One was found on a breaker for a resistive heater where overload protection was not considered critical as molded case circuit breakers protection was provided. On four breakers (including ICM-111) the as-found heater size agreed with the calculated, but arrow position did not agree. Full load amps was at the dividing point for selecting up or down position. Slight changes in motor protection resulted but did not affect the operability of load. Four feeders on BOP were found to be mis-sized. Of those four

one was mis-sized to a degree that replacement was needed to ensure adequate protection. Of the three other overload heaters, though improperly set, would have provided thermal overload protection for equipment. Job Orders to correct these settings by October 30, 1990, have been written.

(2) Corrective Action Taken To Avoid Further Violation

In the course of the plant's investigation it was determined that the mis-sizing and/or mispositioning of the thermal overloads had occurred during initial installation in 1977 and 1978. Lacking vendor information, calculations were most likely developed by plant personnel for positions/sizes which in some of the cases, proved incorrect. The design change process has evolved since that time to a level that reasonably ensures that repetition of a similar condition will not occur. Specifically, general procedures now require that design calculations be verified and documented by qualified personnel.

(3) Date When Full Compliance Will Be Achieved

Based on the engineering evaluation completed January 15, 1990, the deficiencies in the thermal overload heater settings would not have affected the operability of the ICM-111 breaker. Other deficiencies did not degrade the thermal overload protection of the equipment breakers.

Current procedures/practices should prevent recurrence of this problem.

Response to Violation 1c

In the course of the inspection it was found that a plant instruction utilized for document control (drawings) contained no provision mandating that the user of the index verify that it was the most recent update. We concur with the inspector's conclusion that an instruction to users of the Master Drawing Index to ensure that it references up-to-date as-built drawings should be included in procedures.

(1) Corrective Action Taken and Results Achieved

As a result of the inspection, PMI-2030, "Document Control," was revised to instruct a Master Data Index user to ensure that it reflects the latest as-built drawings located in the plant's master file.

(2) Corrective Action Taken To Avoid Further Violation

Revision 11 to PMI-2030 is being routed for approval from plant management. The revision addresses the inspector's concern noted in the Notice of Violation.

(3) Date When Full Compliance Will Be Achieved

The revised version of PMI-2030 will be effective by May 1, 1990.

Response to Violation 1d

Procedural revision to incorporate a direction to run a pump in order to properly adjust packing is not viewed as necessary. Personnel performing packing adjustments meet the requirements of ANSI Standard N18-1 (4.5.3). Consistent with that standard, maintenance personnel receive formal training in subjects associated with their position. Included in the plant's training is a course on pumps that directly references the correct methodology for adjusting the packing on pumps. This teaches maintenance personnel that adjustments will only be made to packing when the pump is operating. As required by ANSI Standard N18-7, Section 4.1 (2), plant procedures are developed with the objective of providing adequate information to personnel involved in a given task considering the skill they are provided through the training program.

(1) Corrective Action Taken and Results Achieved

Those persons who would be involved in pump packing work are hired and trained consistent with ANSI N18-1.

(2) Corrective Action Taken to Avoid Further Violation

The hiring practices and training programs have proven adequate to prevent problems due to pump packing

(3) Date When Full Compliance Will Be Achieved

No violation occurred as practices are in accordance with N18-1 and personnel are fully qualified.

Response to Violation 1e

While the intent of Step 8.1.2-2 of maintenance procedure 12 THP 6030.IMP.014 was to ensure that technicians performing cleaning would utilize tape or similar adhesive-backed material. Black electrical tape, was specified because it is a commonly available item. However, use of a calibration sticker did constitute a violation of the procedure as written.

(1) Corrective Action Taken and Results Achieved

Maintenance supervision reviewed the net effect of utilizing the sticker in the course of cleaning and determined that satisfactory results were obtained. No re-cleaning was deemed

necessary. 12 THP 6030.IMP.014 had been revised via a change sheet initiated April 2, 1990, to remove reference to black electrical tape.

(2) Corrective Action Taken To Avoid Further Violation

The Plant Manager will issue a memo on procedural compliance to ensure that all personnel are fully aware of the meaning of compliance, consequences of failure and what actions to take when a procedure cannot be followed as written. The Maintenance Improvement Plan includes issuance of a department policy on procedure compliance. Included will be guidance on the monitoring of the effectiveness of procedure compliance. Also a procedure writer's/user's guide will address the circumstances for changing a procedure to ensure procedural compliance.

(3) Date When Full Compliance Will Be Achieved

The final draft of the policy will be issued on July 15, 1990. Guidance on the effectiveness monitoring will be issued on August 15, 1990. The Plant Manager's memo will be issued on May 1, 1990.

Response to Violation 1f

(1) Corrective Action Taken and Results Achieved

The Auxiliary Equipment Operator (AEO) involved in this event had received training on the operation of reactor trip breakers and the existence of the procedure prior to this event. The AEO, however, overlooked the reactor trip breaker procedure was required to be "in hand" whenever performing racking operations. Although the racking evolution was done in accordance with the procedure requirements, this event was a violation because the requirement to have the procedure "in hand" was not satisfied.

A memorandum was issued to Operations personnel on January 19, 1990, to remind them of the "in hand" requirement for the reactor trip breaker procedure.

(2) Corrective Action To Be Taken To Avoid Further Violation

The routine surveillance procedures for reactor trip breaker testing were revised on December 13, 1989, to reference the requirement for having the reactor trip breaker racking procedure "in hand" for the racking evolutions. The startup surveillance procedures, which require racking of the reactor trip breakers, will be revised by June 4, 1990, to reference the requirement for having the reactor trip breaker procedure "in hand."

During the past two years, QA audits/surveillances have concluded, except for a "few isolated cases," double asterisked procedures have in fact been "in hand" when required. Therefore, no generic programmatic problem exists.

(3) Date When Full Compliance Will Be Achieved

Full compliance was achieved on December 6, 1989, when the involved AEO was reinstructed of the "in hand" procedural requirement.

Response to Violation 1g

Five procedures/instructions were cited in the Notice of Violation as not having been reviewed within the two-year limit established in plant procedure PMI-2010. However, in each case the documents had been reviewed and documentation to that effect was on file. Upon request one of the inspectors was provided with biannual review documents for IMP.071 and IMP.062. The instruction does not require an approved revision within two years, only a review prior to such revision. This information may not have been adequately communicated.

(1) Corrective Action Taken and Results Achieved

Further review of the Notice of Violation by the plant identified that procedures/instructions noted had received review as required by PMI-2010, Rev. 17.

(2) Corrective Action Taken to Avoid Further Violation

Tracking and review of procedures is presently adequate.

(3) Date When Full Compliance Will Be Achieved

No violation occurred.

NRC Violation 2

"10 CFR 50, Appendix B, Criterion VIII, as implemented by Section 1.7.8 of the Donald C. Cook Operational Quality Assurance Program required that measures be established for the identification of materials, parts and components such as by part number, serial number, or other appropriate means on the item or records traceable to the item throughout fabrication, installation and use of the item."

"Contrary to the above, identification of materials and components for traceability was not accomplished for cable extension portions and aluminum splicing sleeves for connections to several safety-related motor control centers installed under the Request For Change 1482 modification (315/89031-02; 316/89031-02)."

Response to Violation 2

RFC-1482 installed transition pieces (sleeves) to splice copper to aluminum cables in various motor control centers. Per RFC instructions, the transition pieces were to be installed in accordance with Engineering Design Specification (EDS) 607 and EDS 608. The installation took place between June of 1979 and September of 1981 when the final summary was issued.

A search of the completed RFC package (including installation job orders) and of the microfilm of the completed job order packages revealed no documentation of the parts (sleeves) used for the installation.

Individuals who were involved with the Maintenance Department at that time stated that personnel would have installed the transition pieces per the EDS as stated in the RFC.

Inadequate documentation of material installed by a Job Order during the design change process was the root cause of this violation. Additionally, there were inadequate review of the completed job orders and the design change package upon completion.

(1) Corrective Action Taken and Results Achieved

The installation took place approximately 10 years ago and was performed in accordance with EDS 608, which was referenced in the RFC package. Actual application for the past ten years has functionally demonstrated the adequacy of subject materials.

(2) Corrective Action Taken To Avoid Further Violation

Current procurement/dedication practices ensure proper documentation is developed to demonstrate control over the suitability of material, parts and components.

(3) Date When Full Compliance Will Be Achieved

Current procedures/practices should prevent recurrence of this problem and ensure future compliance.

NRC Violation 3

"10 CFR 50, Appendix B, Criterion XI, as implemented by Section 1.7.11 of the Donald C. Cook Operational Quality Assurance Program required that a test program be established to assure testing to demonstrate that systems and components will perform satisfactorily in service in accordance with test procedures which incorporate requirements and acceptance limits contained in applicable design documents, and that adequate test instrumentation was available and used."

"Contrary to the above, test instruments were not sensitive or accurate enough to verify the calibration of the undervoltage relays that actuate the Emergency Diesel Generators. Procedure 2 THP 6030 IMP.250, "4kV Diesel Start, 4kV ESS Bus Undervoltage Relay Calibration," Revision 7, Section 3.0, required the use of a Westinghouse type PA-161 AC anolog [sic] voltmeter or its equivalent with equal or better accuracy and adequate range to measure the desired parameters. However, the voltmeter had a tolerance of $\pm$1.5 volts that was not sufficiently accurate to measure the desired parameter of 90.3 to 91.8 volts specified in Technical Specification 3.3.2. In addition, the voltmeter indicated to the nearest whole volt and did not have division markings between the numbers. Technicians had to interpolate results and record values to the nearest tenth of a volt while the voltmeter's dial indicator was moving in the increasing or decreasing direction. Furthermore, the technicians used hand signals to communicate the moment the under voltage relay operated. Based on the inaccuracy and insensitivity of the voltmeter, and poor testing technique, results of the undervoltage test were not conclusive (315/89031-03; 316/89031-03)."

Response to Violation 3

The meter used was first specified in the original procedure developed before initial plant start-up. The specific reasons for using this meter could not be determined. However, it is believed that this was the limit of the available technology at that time. The only other meter available was a basic digital type, which could not be used due to the inherently slow response and update time, causing a greater uncertainty of specific setpoint value than the analog meter.

(1) Corrective Actions and Results Achieved

I&C now uses the Fluke Model 45 digital meter during testing of the 4KV diesel start and 4KV ESS bus undervoltage relays.

Recent developments in digital meters which include faster response times and update times and minimum/maximum modifier features has made their use acceptable. The digital meter currently being used has an accuracy of ± 0.3 percent. The previous test method provided acceptable results, based on the as-found values on the first use of the digital meters being in specification by comparable percentages.

(2) Corrective Actions Taken To Avoid Further Violation

The calibration procedures which currently allow use of either analog or digital meters will be changed to specify the use of the Fluke Model 45 digital meter, or its equivalent, to ensure consistent use of a digital meter.

(3) Date When Full Compliance Will Be Achieved

The procedure changes will be completed before April 30, 1990.

NRC Violation 4

"10 CFR 50, Appendix B, Criterion XVI, as implemented in Section 1.7.16 of the Donald C. Cook Operational Quality Assurance Program required that measures be established to assure that conditions adverse to quality were promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition was determined and corrective action taken to preclude repetition.

"Contrary to the above:

a. The Plant Assessment Group Committee's review in March 1989 for Problem Report 89-245, concerned with the February 1989 failure of two safety-related 4kV breakers T-11D6 and T-1104 to close on demand during tests due to lubrication hardening, failed to specify corrective action to prevent recurrence. Furthermore, no action was taken to inspect other 4kV breakers for common mode failure. Consequently, in March and April of 1989 seven additional safety related and balance of plant breakers failed to close during testing, which was also caused by hardening of the lubricant on the breaker linkage (315/89031-04A; 316/89031-04A).

b. Corrective action was neither prompt nor adequate to correct maintenance related problems identified by the licensee in February 1988. In December 1989, 36 of these 71 self identified findings and recommendations were reopened. During this inspection many of the same problems were identified that reflect a significant weakness in the corrective action system (315/89031-04B; 316/89031-04B)."

Response to Violation 4a

Based on review of Problem Report 89-245, which was addressed in the Notice of Violation it is our position that no actual violation occurred. The February 27, 1989, condition was identified during scheduled preventive maintenance work and resulted in the problem report. That discovery, coupled with a similar condition also found during preventive maintenance, resulted in a Part 21 report. The Part 21 investigation revealed that vendor-specified information contained no instruction for periodic lubrication of the breakers. Similar breakers used in the plant had, until that time, passed test requirements. The plant's actions which were taken promptly, included revision of the procedure based on new input from the manufacturer, initiation of Job Orders to inspect all other similar breakers installed in both units, and establishment of scheduled inspections to identify possible repetition of the

condition in the future. The Notice of Violation incorrectly concluded that no action was taken to inspect additional breakers or develop corrective action. Two subsequent problem reports were initiated as a result of deficiencies found in the inspections and tests covered by our expanded action for Problem Report 89-245 and the associated Part 21 review. Those reports were initiated to document the similar conditions on the noted breakers. Within two months of the March 1, 1989, Part 21 report to the NRC, the plant had completed the inspections, cleaned and relubricated the breakers in both units as recommended by the revised vendor information, and documented each case when a similar condition was found.

(1) Corrective Action Taken and Results Achieved

The result of Problem Report 89-245, which was reviewed by the Plant Assessment Group on March 17, 1989, was to inspect, clean and lubricate similar breakers in both units and document the results.

(2) Corrective Action Taken to Avoid Further Violation

Procedure changes and inspections were scheduled as a result of addressing the problem reported in Problem Report 89-245 on similar breakers. These actions generated additional Job Orders and condition reports which were referenced in the inspection report.

(3) Date When Full Compliance Will Be Achieved

No violation occurred.

Response to Violation 4b

As discussed in our response to Weakness (1), AEP has taken numerous corrective actions to address the problems identified by the Maintenance Self-Assessment. These actions include:

- the development of a RCM Program
- the acquisition of the Nuclear Plant Maintenance (NPM) Module
- the development of a System Engineer Program
- the acquisition of NUS's PRONET and the services of NUS's procedure writers.

In order to effectively implement programs as encompassing and comprehensive as these, significant analysis, planning and coordination are needed. As such, it will take several years to completely implement some of the corrective actions we have initiated.

(1) Corrective Actions and Results Achieved

Maintenance-related problems identified in the Maintenance Self-Assessment will be reviewed and resolved as appropriate, with implementation of the Maintenance Improvement Plan.

(2) Corrective Actions Taken to Avoid Further Violation

The Improvement Plan includes milestones and a built-in mechanism that requires regular re-evaluation of the plan and monitoring of its effectiveness to ensure that it is providing the desired results and that there is continuing improvement in all maintenance-related areas.

(3) Date When Full Compliance Will Be Achieved

Resolution and documentation of the identified items will be completed by June 1, 1991.