

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/88008(DRP); 50-316/88009(DRP)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation  
Indiana and Michigan Electric Company  
1 Riverside Plaza  
Columbus, OH 43216

Facility Name: Donald C. Cook Nuclear Power Plant, Units 1 and 2

Inspection At: Donald C. Cook Site, Bridgman, Michigan

Inspection Conducted: January 27 through March 14, 1988

Inspectors: B. L. Jorgensen

J. K. Heller

Approved By: *Bruce L. Burgess*  
Bruce L. Burgess, Chief  
Reactor Projects Section 2A

*3/25/88*  
Date

Inspection Summary

Inspection on January 27 through March 14, 1988 (Reports No. 50-315/88008(DRP);  
No. 50-316/88009(DRP))

Areas Inspected: Routine, unannounced inspection by the resident inspectors of: actions on previously identified items; plant operations; radiological controls; maintenance; surveillance; fire protection; security; quality program activities; and NRC Information Notices.

Results: Of the nine areas inspected, no violations or deviations were identified in any areas.

## DETAILS

### 1. Persons Contacted

- \*W. Smith, Jr., Plant Manager
- \*A. Blind, Assistant Plant Manager - Administration
- \*J. Rutkowski, Assistant Plant Manager - Production
- L. Gibson, Assistant Plant Manager - Technical Support
- \*B. Svensson, Licensing Activity Coordinator
- \*K. Baker, Operations Superintendent
- \*J. Sampson, Safety and Assessment Superintendent
- E. Morse, Quality Control Supervisor
- T. Beilman, I&C/Planning Superintendent
- \*J. Droste, Maintenance Superintendent
- \*T. Postlewait, Technical Superintendent - Engineering
- L. Matthias, Administrative Superintendent
- \*M. Horvath, Quality Assurance Supervisor
- D. Loope, Radiation Protection Supervisor
- \*J. Kauffman, Construction Manager

The inspector also contacted a number of other licensee and contract employees and informally interviewed operations, maintenance, and technical personnel.

\*Denotes some of the personnel attending the Management Interview on March 16, 1988.

### 2. Actions on Previously Identified Items

The NRC Region III Division of Reactor Safety has reviewed the D. C. Cook Open Item List and determined that the items listed below can be administratively closed. This determination is documented in a January 14, 1988 memorandum from N. J. Chrissotimos (Deputy Director, Region III Division of Reactor Safety) to C. E. Norelius (Director, Region III Division of Reactor Projects).

- a. (Closed) Unresolved Item (315/85007-02; 316/85007-02): As updated in Inspection Reports 50-315/85005(DRS); 50-316/85005(DRS): Timeliness of corrective actions for AEPSC internal audit QAVP-84-01 of the Nuclear Material and Fuel Management Section.
- b. (Closed) Unresolved Item (315/83001-04; 316/83001-04): As updated in Inspection Reports 50-315/85003(DRS); 50-316/85003(DRS) and 50-315/87022(DRS); 50-316/87022(DRS): Qualification of persons allowed to verify inspections either not recorded or not sufficient.
- c. (Closed) Open Item (315/86005-05: As updated in Inspection Report 50-315/86031(DRS): Quality assurance evaluation of vendors to provide receipt inspection.
- d. (Closed) Unresolved Item (315/86019-04; 316/86019-04) Potential inadequacy of receipt inspection.



No violations, deviations, unresolved or open items were identified.

3. Operational Safety Verification

Routine facility operating activities were observed as conducted in the plant and from the main control rooms. Plant startup, steady power operation, plant shutdown, and system(s) lineup and operation were observed as applicable.

The performance of licensed Reactor Operators and Senior Reactor Operators, of Shift Technical Advisors, and of auxiliary equipment operators was observed and evaluated including procedure use and adherence, records and logs, communications, shift/duty turnover, and the degree of professionalism of control room activities.

Evaluation, corrective action, and response for off normal conditions or events, if any, were examined. This included compliance to any reporting requirements.

Observations of the control room monitors, indicators, and recorders were made to verify the operability of emergency systems, radiation monitoring systems and nuclear reactor protection systems, as applicable. Reviews of surveillance, equipment condition, and tagout logs were conducted. Proper return to service of selected components was verified.

- a. The inspector reviewed the circumstances surrounding a telephone notification from the licensee to the NRC on February 5, 1988 via the Emergency Notification System. The licensee reported identification of a condition which appeared to be outside the design basis assumptions used for the NRC Safety Evaluation Report (SER) on the D. C. Cook Reactor Vessel Level Indication System (RVLIS).

Specifically, it was discovered during a licensee-initiated programmatic review of NUREG 0737 and Regulatory Guide 1.97 items (many of which are still pending incorporation into Technical Specifications) that SER information concerning two independent RVLIS power supplies was incorrect. RVLIS at D. C. Cook is not powered by two independent Class 1E power supplies. The actual design incorporates a single power supply, which is consistent with Technical Specifications requiring one channel of RVLIS operable.

Subsequent reviews showed the current design is adequate. NRC approval of a Specification for one-channel operability superseded the original SER, such that the current design is in accordance with the required design basis as well. The licensee therefore withdrew his February 5 notification via a subsequent phone call on March 4, 1988.

- b. The inspector reviewed the circumstances of a February 23, 1988 ENS notification concerning adequacy of Technical Specifications for "controlled leakage". The NSSS vendor (Westinghouse) informed the



licensee on that date that the Technical Specification limit of 52 gpm permitted operation outside the conditions assumed in plant accident analyses - namely, 40 gpm. The licensee notification referenced reporting requirements from both 10 CFR Part 50 and 10 CFR Part 21.

Administrative controls were immediately implemented to limit controlled leakage below 40 gpm. The inspector verified implementation of these controls.

Subsequent detailed evaluation of additional information from Westinghouse led the licensee to conclude the discrepancy would not have created a substantial safety hazard, nor was it outside D. C. Cook plant-specific design limits. On that basis, the notification was withdrawn.

- c. The inspector performed a technical review of licensee procedure \*\*1-OHP 4021.009.001 "Placing Containment Spray System in Standby Readiness". No discrepancies were identified.
- d. A walkdown was performed to verify correct valve and control positions associated with the Containment Spray and Iodine Removal systems. Data/Sign-off sheets from procedures \*\*1-OHP 4021.009.001 and \*\*1-OHP 4030 STP.007E were used in part of this walkdown. A number of valves were noted which were locked or sealed in position, when the data/signoff sheet did not specify locks or seals. The licensee maintains a separate listing which focuses solely on locked or sealed valves.
- e. The inspector reviewed operating and alarm response procedures relating to containment spray and iodine removal systems.
  - (1) 1-OHP 4024.105 "Annunciator No. 5 Response - Containment Spray" (Unit 1)
  - (2) 2-OHP 4024.205 "Annunciator No. 5 Response - Containment Spray" (Unit 2)

Each Unit has two alarms for diminishing iodine removal (spray additive) tank level; one at 4,000 gallons and one at 18-inches from the tank bottom, some seven feet below the 4,000 gallon mark. The annunciator for Unit 1 also has an alarm for room sump level high. Both spray additive tanks are in the same room. Instructions for each of these alarms were clear and consistent.

Each Unit also has two alarms associated with actuation of containment spray. Drop 005, "Spray Actuation", contains instructions concerning "subsequent" (vice immediate) operator actions. For both Units, these instructions refer the operator to procedure 1- or 2-OHP 4022.008.002. These procedures were cancelled in June, 1986 and replaced by



procedure 01- or 02-OHP 4023.ES-13, "Transfer to Cold-Leg Recirculation". Drop 010, "Containment Isolation Phase B", also contains a reference to OHP 4022.008.002. In addition, operators are referred - for "Immediate/Manual" action(s) - to procedure 1- or 2-OHP 4022.034.002, which was also cancelled in June 1986. It was replaced by 01- or 02-OHP 4023.FR-2.1, "Response to High-High Containment Pressure".

The licensee initiated appropriate change sheets to correct the outdated references.

- f. Specific observations were made on February 18, 1988, concerning shift turnover from "Afternoon" to "Midnight" shift. A previous report noted the control room was being vacuumed during this turnover on one previous occasion. No distractions existed during the turnover observed this inspection period; it was quiet, orderly and complete.
- g. The inspector toured the licensee's new onsite control room simulator on February 29, 1988, to observe facility utilization in validating procedures. Licensee procedure \*\*02-OHP 4023 E-3 "Steam Generator Tube Rupture" was undergoing validation at the time of the tour. Comments and notes on this procedure and others previously validated were reviewed.
- h. The inspector independently confirmed six Unit 1 and Unit 2 reactor coolant system (RCS) unidentified leak rate calculations (1- and 2-OHP4030 STP.016 Data Sheet 2) from February 8 through 10, 1988. NUREG 1107 "RCS LK9 Reactor Coolant System Leak Rate Determination For PWRs" was used in the comparison. All six licensee calculations were in agreement with the NRC calculations.

No violations, deviations, unresolved or open items were identified.

#### 4. Radiological Controls

During routine tours of radiologically controlled plant facilities or areas, the inspector observed occupational radiation safety practices by the radiation protection staff and other workers.

Effluent releases were routinely checked, including examination of on-line recorder traces and proper operation of automatic monitoring equipment.

Independent surveys were performed in various radiologically controlled areas.

- a. The inspector made a specific tour of the new Containment Access Building (CAB) shortly after it was placed in service in mid-February, 1988. The CAB is an approximate 10,000 square-foot facility constructed to provide a dedicated controlled access to the upcoming Unit 2 steam generator repair project. It contains lockers





and change areas, monitored access and egress paths, fixed and portable radiological instrumentation, offices and other support facilities.

- b. Modifications to the newly re-opened normal auxiliary building access control area were examined. The licensee has constructed a radiation protection technician "service counter" which provides direct viewing of the posted Radiation Work Permits (RWPs) and of the computer-controlled check-in stations providing building access. A new computer work station at the service counter permits the assigned technician to add personnel to or delete personnel from RWPs as necessary.
- c. Discussions were held concerning proposed plans to modify the existing normal auxiliary building egress, re-locating the personnel contamination detectors slightly (by moving back a wall to widen the egress hallway) to improve traffic flow. Hot lab coverage by these detectors will also be clarified.

No violations, deviations, unresolved or open items were identified.

#### 5. Maintenance

Maintenance activities in the plant were routinely inspected, including both corrective maintenance (repairs) and preventive maintenance. Mechanical, electrical, and instrument and control group maintenance activities were included as available.

The focus of the inspection was to assure the maintenance activities reviewed were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with Technical Specifications. The following items were considered during this review: The Limiting Conditions for Operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures; and post maintenance testing was performed as applicable.

The following activities were inspected:

- a. The inspector toured plant warehouse areas on March 1, 1988, in company with responsible licensee management. The area dedicated to equipment and supplies procured especially for design changes was specifically examined. This area was clean and orderly, parts were clearly identified, and only "accepted" items were stored in the area. The licensee had recently installed temporary insulation and area heaters to maintain environmental conditions in the area in accordance with "Level B" storage requirements. Full compliance to these requirements was not verified as part of this inspection.
- b. The inspector observed a receipt inspection in progress on new Residual Heat Removal (RHR) heat exchanger bypass control valves, and discussed the process and results with the receipt inspector.



Disposition of "rejected" items was also discussed. The inspector learned via these discussions of the rejection and the ongoing detailed evaluation of some motor-operated valve assemblies procured for installation in the auxiliary feedwater injection lines in both Units. The rejection was based on a maintenance mechanic's finding what he viewed to be unusual coloration of the limit switch assembly lubricant in two assemblies destined for Unit 2. At the time of this finding, eight new valve assemblies had already been installed in Unit 1.

Late in the inspection period, the licensee received a report (from an independent laboratory engaged to analyze the lubricant) that the material was a mixture of Mobil 28 and Beacon 325 greases. A lubrication specialist from Mobil recommended changing the grease in the installed Unit 1 valves at the next outage of sufficient duration, but indicated no short-term lubrication problems were anticipated. The inspector questioned whether the Unit 1 valves, if they contain a mixture of greases, are environmentally qualified for potential high-energy line breaks. This question was under review by the licensee at the conclusion of the inspection. Pending resolution of the environmental qualification status of the installed Unit 1 valves, this is considered an Unresolved Item (315/88008-01).

- c. The inspector reviewed completed Unit 2 Job Order (JO) files (PS-44, ME-VKG-SI and ME-VMO-IMO) and selected items pertaining to the Containment Spray Systems as candidates for additional reviews. During these reviews the inspector found a number of Job Orders for packing adjustments. For such jobs, the inspector verified that stroke timing was performed prior to returning the valves to service.

(1) JO 701201 "Adjust packing on valve 2-IMO-225 to stop packing leak". This leak was stopped when the packing was tightened, but this apparently caused the torque switch to activate prior to full closure. To resolve this, the torque switch was adjusted. The inspector noted that MOVATS testing was not required after the torque switch was adjusted. This was discussed with the maintenance engineer, who stated that the procedure for setting the switches requires followup engineering review for specification of applicable testing; i.e., testing is determined on a case basis.

(2) JO 012784 "2-IMO-212 will not close with the control switch". The Job Order documents that the stem, packing and gasket were replaced. The inspector verified material description/number with plant stores and found that the stem part number was deleted in 1981 when the last stem was checked



out. This was discussed with the maintenance Production Controller, who was able to show, by additional information contained in the Job Order package, that the wrong part number was documented.

- (3) JO 701470 "2-IMO-212 will not seal closed when the control switch is placed closed". These Job Orders documented that the stem, packing and gasket were replaced. In addition, the Job Order documents that the stem was found bent.

Items (2) and (3) above show a new stem installed in June 1987 was found bent by November, 1987. The Maintenance Superintendent was asked to review these Job Orders and determine what is causing stem damage. The Maintenance Superintendent agreed to review this item. This is an Open Item pending completion of the review. (Open Item 316/88009-01)

- (4) JO 70048 "Repair gear slippage in gear train for local indicator."  
(5) JO 11992 "IMO-270 will not close from control room."  
(6) JO 011688 "IPX-221 located at the suction to the West Containment Spray Pump, has a weld leak."  
(7) JO 710102 "IPX-221, located at the suction to the West Containment Spray Pump, has a weld leak."

For Items (6) and (7) the weld leaks were at different locations. For each Job Order, the inspector found that the weld card was complete and that inspections by the ANI and notifications to the State of Michigan were made. When the inspector found no evidence of a post-weld hydrostatic test, this was discussed with a maintenance engineer. He identified a section in the 1983 revision of ASME Section XI which exempts 1-inch pipes from post repair hydrostatic tests.

One open item, one unresolved item, and no violations or deviations were identified.

#### 6. Surveillance

The inspector reviewed Technical Specifications required surveillance testing as described below and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that Limiting Conditions for Operation were met, that removal and restoration of the affected components were properly accomplished, that test results conformed with Technical Specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The following activities were inspected:

- a. \*\*2 THP 6030 IMP.250 "4KV Diesel Start, 4 KV ESS Bus Undervoltage Relay Calibration."
- b. \*\*2 THP 4030 STP.120 "Steam Generator 3 and 4 Mismatch Protection Set I Surveillance Test (Monthly)."

The inspector noted a representative of the plant Quality Control Department was present performing an independent surveillance on the conduct of this test. See Paragraph 9.a.

- c. \*\*1 THP 4030 STP.019 "Steam Generator 1 and 2 Mismatch Protection Channel I Surveillance Test (Monthly)."
- d. \*\*12 THP 6030 IMP.014 "Protective Relay Calibration."
- e. \*\*1-OHP 4030 STP.007E "East Containment Spray System Operability Test."

A technical review was performed on this procedure, with no discrepancies identified. Further, as noted in Paragraph 3.d above, Valve Lineup Sheet No. 1 from this procedure was utilized in performing part of a system walkdown.

- f. The inspector was in attendance at a Problem Assessment Group (PAG) meeting on March 2, 1988 when PAG considered a reported failure of an inner containment airlock door "between seals" test. This test had immediately followed a successful 6-month overall airlock leak test. The seals were "relaxed" by opening and reclosing the inner door and a successful "between seals" test was performed. The PAG expressed some uncertainty whether opening the outer door, to permit entry into the airlock so the inner door could be cycled, constituted an event to which Technical Specification 3.0.3 applied. The consensus was that 3.0.3 did not apply because Technical Specifications address a time limit for such conditions at 3.6.1.3. Subsequently, the licensee verified this interpretation was consistent with a review of similar conditions documented in the Minutes of Meeting No. 1669 of the Plant Nuclear Safety Review Committee.
- g. During this inspection period, the licensee completed and provided to the inspector an evaluation of the ice condenser floor drain valve opening force, as specified in procedure \*\*12 THP 4030 STP.246 "Inspection of Ice Condenser Floor Drain Valves". The evaluation reconciled the 100-lb. valve opening force specified in the procedure, and in the Technical Specifications, with lower forces (72-lb. or less) associated with an FSAR assumed 18 inches of water on a 12-inch diameter valve gate. Historic vendor (Westinghouse) correspondence shows the 100-lb. force includes allowance for some sticking due to frost or dirt, but is sufficiently low to assure





opening before water depth could interfere with functioning of the lower ice condenser inlet doors. This information satisfied inspector questions about the 100-lb. force which precipitated the review.

No violations, deviations, unresolved or open items were identified.

7. Fire Protection

Fire protection program activities, including fire prevention and other activities associated with maintaining capability for early detection and suppression of postulated fires, were examined. Plant cleanliness, with a focus on control of combustibles and on maintaining continuous ready access to fire fighting equipment and materials, was included in the items evaluated.

On February 5, 1988, the licensee reported via special report to NRC Region III that, pursuant to Technical Specification Sections 3.3.3.7b (Unit 1) and 3.3.3.8b (Unit 2) the auxiliary building Fire Detection System at the 650-foot elevation was not operable. This area is equipped with ionization type fire detectors which, due to heavy welding activity on the building crane upgrade project, had become dirty and would not reset when the area cleared. The detectors are to be cleaned and returned to service on completion of the crane upgrade. Meanwhile, required fire watches are being maintained.

No violations, deviations, unresolved or open items were identified.

8. Security

Routine facility security measures, including control of access for vehicles, packages and personnel, were observed. Performance of dedicated physical security equipment was verified during inspections in various plant areas. The activities of the professional security force in maintaining facility security protection were occasionally examined or reviewed, and interviews were occasionally conducted with security force members.

- a. The inspector met with plant management involved with security matters on January 29, 1988 to discuss ideas and sources (particularly NRC NUREG documents) addressing security guard performance. NRC Region III is currently following guard attentiveness to duty quite closely.
- b. During one facility tour the inspector noted a keycard-controlled door ajar, with a hose passing through. The inspector opened the door to pass through and found a security guard was monitoring the door from the opposite side. The inspector found the guard knowledgeable concerning door and card-reader status and use requirements.

No violations, deviations, unresolved or open items were identified.



9. Quality Programs

The effectiveness of management controls, verification and oversight activities, in the conduct of jobs observed during this inspection, was evaluated.

The inspector frequently attended management and supervisory meetings involving plant status and plans and focusing on proper co-ordination among Departments.

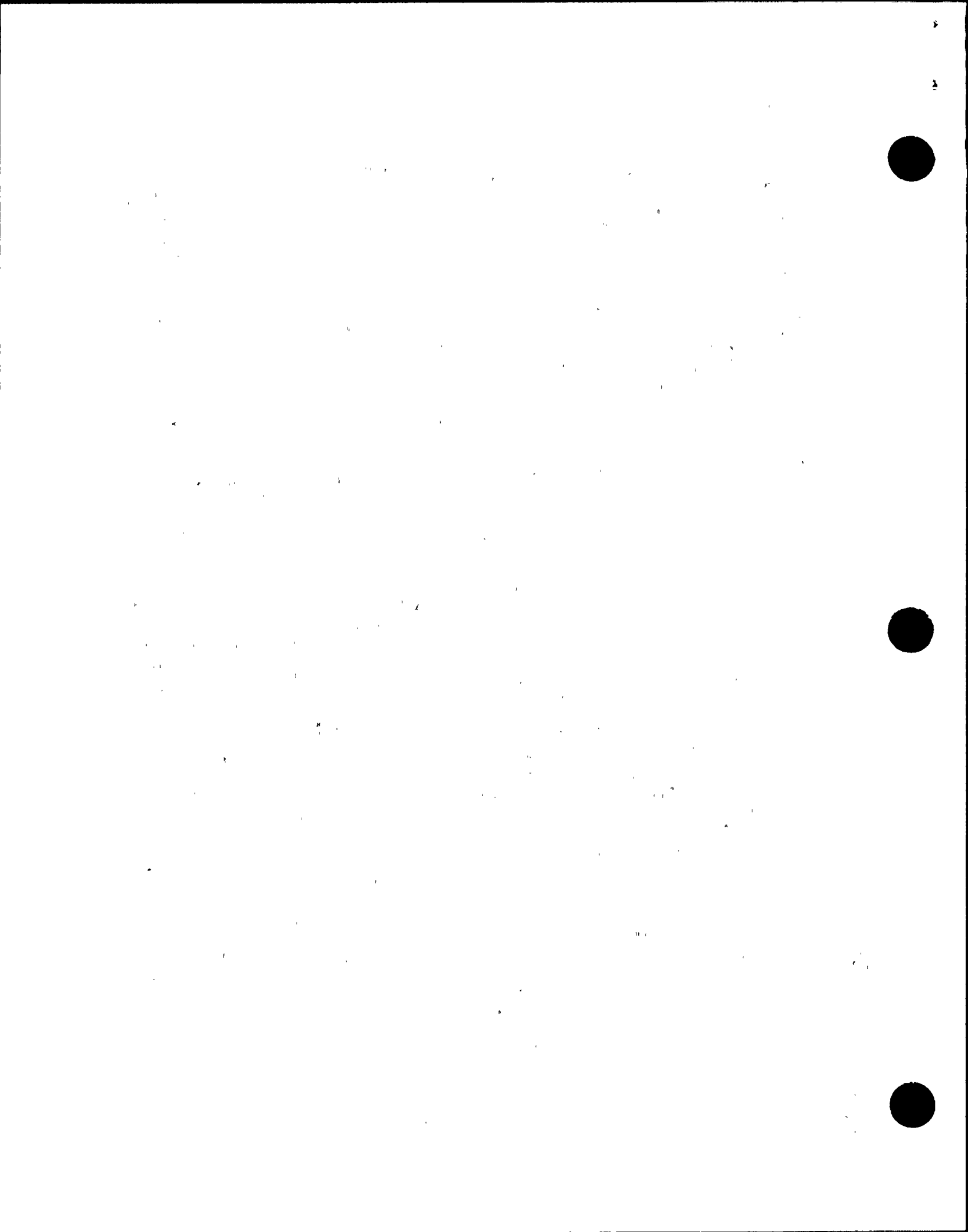
The results of licensee auditing and corrective action programs were routinely monitored by attendance at Problem Assessment Group (PAG) meetings and by review of Condition Reports, Problem Reports, and security incident reports. As applicable, corrective action program documents were forwarded to NRC Region III technical specialists for information and possible followup evaluation.

- a. The inspector met with representatives from the Quality Control (QC) group to discuss plans and status relating to observation and verification of activities by QC inspectors. In response to a Quality Assurance audit finding that these activities have not been proceduralized and well documented in the past, QC is developing revisions to Plant Manager Instruction PMI-7090 "Plant Quality Control Program" and to PMI-2010, "Plant Manager and Department Head Instructions, Procedures and Associated Indexes" to define and focus on quality control "attributes" and how they will be verified.

Though approximately 5,600 QC "surveillances" were performed in 1987, the associated records were not compiled in a manner amenable to subsequent trending, categorization or evaluation. A computerized database has been initiated by ten "fields" (or combinations) such as involved Department, Unit, Job Order number, design change number, procedure number, system or component ID number.

An Office Guide has been issued to control documentation of activities by QC. Among new initiatives is a plan to perform a minimum of one surveillance on every routine Technical Specification test in every Department each calendar year. This will involve over 800 different tests each year. In addition, verification of QC attributes is expanding into laboratory activities, Operations Department lineups and clearances, and outage items/repairs.

- b. During one meeting with senior plant management, the inspector was briefed on the status of licensee plans involving "dedication" of commercial grade items for nuclear grade service. AEPSC General Procedures (GP) currently lack specific instructions on how to accomplish "dedication", although an interim outline of recommended steps has been developed by the AEPSC QA Department. Revision of GPs is being deferred pending publication of results from an NRC-industry group effort on this topic.



- c. The inspector discussed timing of corrective action program item reviews with a licensee management representative. The focus was toward assuring evaluations are completed in a timeframe consistent with 30-day limits to report certain items to the NRC. The Problem Assessment Group (PAG) at the plant has implemented constraints to avoid drawn-out assessments which postpone a reportability decision. The corporate PAG has typically permitted longer evaluation times, however the licensee indicated a more limiting approach is recently being taken.

No violations, deviations, unresolved or open items were identified.

#### 10. Information Notices

By letter dated October 1, 1987, Region III requested review of the Information Notices listed below. For each Information Notice the inspector verified that the Information Notice was reviewed by Management representatives, a written response was submitted if required, and plant-specific actions were taken or scheduled as described.

- a. (Closed) NRC Information Notice 87-34: "Single Failures in Auxiliary Feedwater Systems". The licensee review dated October 16, 1987, documents that independent power and control circuit supplies, as well as independent component are used in the Motor Driven Auxiliary Feed Pump system. The review concluded one control circuit component failure would not affect both pump circuits.
- b. (Closed) NRC Information Notice 87-42: "Diesel Generator Fuse Contacts". The licensee review dated January 8, 1988, documents that the fuse contacts were inspected and found to function properly. The licensee is currently evaluating the need for periodic inspection.
- c. (Closed) NRC Information Notice 87-53: "Auxiliary Feedwater Pump Trips Resulting From Low Suction Pressure". The licensee review dated December 1, 1987, documents that NRC approval to delete the low suction pressure trips was received on June 20, 1986, and that the Unit 1 trips have been removed and the Unit 2 trips will be removed during the upcoming steam generator replacement outage.
- d. (Closed) NRC Information Notice 87-24: "Operational Experience Involving Losses of Electrical Inverters". The licensee review dated June 12, 1987, documents that the plant has experienced problems with electrical inverter losses due to high ambient temperature and that the inverters were replaced in 1986.

No violations, deviations, unresolved or open items were identified.

#### 11. Open Items

Open Items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An Open Item disclosed during the inspection is discussed in Paragraph 5.c.



12. Unresolved Items

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An Unresolved Item disclosed during the inspection is discussed in Paragraph 5.b.

13. Management Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on March 16, 1988, to discuss the scope and findings of the inspection. In addition, the inspector asked those in attendance whether they considered any of the items discussed to contain information exempt from disclosure. No items were identified.