U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-315/89014(DRP); 50-316/89014(DRP)

Docket Nos. 50-315; 50-316 License Nos. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation
Indiana Michigan Power 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, MI

Inspection Conducted: March 22 through April 25, 1989

Inspectors: B. L. Jorgensen
D. G. Passehl

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

5/9/89
Date

Inspection Summary

Inspection on March 22 through April 25, 1989 (Report Nos. 50-315/89014(DRP); 50-316/89014(DRP))
Areas Inspected: Routine unannounced inspection by the resident inspectors of: actions on previously identified items; plant operations; maintenance; surveillance; fire protection; outages; reportable events; NRC Region III requests; and, followup on problems or events. No Safety Issues Management System (SIMS) items were reviewed.
Results: Of the nine areas inspected, no violations or deviations warranting a written Notice were identified in any areas.

The inspection disclosed occasional weaknesses in the licensee's work controls for sequencing or otherwise co-ordinating multiple activities among diverse work groups (see Paragraph 4.d). The inspection noted strengths in the licensee's timely reporting of potential problems to NRC; however, in some cases incomplete or erroneous information was provided (see Paragraph 10). No new Open Items and/or Unresolved Items were identified.

## 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, QC/NDE General Supervisor
T. Beilman, I&C Department Superintendent
J. Droste, Maintenance Superintendent
T. Postlewait, Technical Superintendent - Engineering
L. Matthias, Administrative Superintendent
J. Wojcik, Technical Superintendent - Physical Sciences
M. Horvath, Quality Assurance Supervisor
D. Loope, Radiation Protection Supervisor

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 Management Interview on April 27, 1989.

2. Actions on Previously Identified Items (92701, 92702)

a. (Closed) Violation (316/89002-02): The 2CD emergency diesel generator was declared operable after maintenance with an unauthorized part installed. The licensee responded by letter (AEP:NRC:1090) dated March 31, 1989, describing corrective and preventive actions. The description of preventive actions was not completely satisfactory, but actual actions taken exceeded those described and appeared adequate.

b. (Closed) Open Item (315/87026-01; 316/87026-01): Pressurizer spray valve reliability enhancements. The licensee has addressed this issue by acquiring a spare valve for "hands-on" maintenance training in the proper techniques for packing, aligning and setting valves during maintenance, and by working with the valve vendor (Copes-Vulcan) to ensure correct information on these valves is acquired. The vendor assisted by sending a representative on a site visit during January, 1989, to observe and assist in operating air pressure setting. Operating experience with the valves has shown improved reliability.

c. (Closed) Open Item (315/87026-03; 316/87026-05): Evaluate trending in operator errors. Both the licensee's Operations Department and

the Safety and Assessment Department perform reviews of all operator errors, including a specific review by the latter for any "adverse" trend. A potential adverse trend noted during this process was at the root of this item. Ongoing reviews subsequent to that time have confirmed that there are occasional irregularities (clusters and gaps) in the occurrence of errors by operators, but there is no negative performance trend overall. Error frequency remains near (but not at) zero errors per thousand activities - using equipment removal from and return to service as the benchmark "activities".

d. (Closed) Unresolved Item (315/88008-01): Licensee to document environmental qualification of valves in Unit 1 if they contain "mixed" grease. The subject valves (auxiliary feedwater injection flow control valves installed in 1987) have been inspected and the manufacturer supplied grease has been removed and replaced. The inspection showed the original grease to be of an environmentally qualified type different from that preferred by the licensee. This grease had trace amounts of contamination in some cases, with the type preferred and used by the licensee, but no "mixtures" were found.

3. Operational Safety Verification (71707, 71710, 42700)

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. Unit 1 remained in a scheduled refueling, maintenance, modification and testing outage throughout the inspection period. Unit 2 operated routinely at power, with reductions from full power on several occasions to permit main condenser and/or feedpump turbine condenser access and inspection. The inspections identified various circulating water leaks to the condensers which upset secondary system chemistry. These were repaired.

Unit 2 reactor power was decreased from about 50-percent to 8-percent on March 24, 1989 after about a week online. The shutdown permitted access for repair of air-operated valve QRV-112, which had failed closed and isolated normal reactor coolant letdown to the chemical and volume control system. Reactor coolant inventory control was maintained using the "excess" letdown system. The problem was traced to a torn diaphragm inside the valve which was repaired. Power escalation commenced late on March 24th and reached 99-percent rated thermal power on March 27, 1989.

b. On April 13, 1989, the inspector learned that the Zion Nuclear Plant had discovered an apparent design discrepancy (involving auxiliary feedwater) which could have implications at D. C. Cook. In case of a loss of suction to the turbine driven auxiliary feedwater pump (TDAFP) from the condensate storage tank (CST), procedures provide for alignment of the TDAFP suction to the discharge of service water pumps. This would increase pressure on the suction header to about 90 psig. The TDAFP is equipped with a self-cooling loop from the pump discharge, through a pressure breakdown orifice, through parallel lines serving the turbine oil and the pump governor coolers, then back to the pump suction through check valves. The self-cooling loop operates at less than 75 psig. Thus, with suction lined up to service water, the self-cooling loop check valves would be held shut and there would be no flow through the coolers. Pressure in the loop would increase until safety valves upstream of the coolers relieved at 75 psig, but this would still provide no cooler flow.

The licensee was informed of the potential problem on April 14. Their investigation concluded that turbine lube oil and governor cooling could not be ensured with suction lined up to service water. Immediate action was taken to modify the applicable Unit 2 procedure (**2-OHP 422.055.003, "Loss of Condensate to Auxiliary Feedwater Pumps") because Unit 2 was in power operation and had operability requirements for auxiliary feedwater. The procedure change provides for opening instrument valves downstream of the coolers, attaching tubing, and establishing flow through the coolers to the floor drain system. Operating shift crews were informed of the procedure change by a memorandum. Long-term engineering evaluation responsibility was assigned to the corporate office, and an industry notification was issued via the INPO "Notepad" system.

c. On one turbine building tour the inspector noted unusual noises in the operation of circulating water pump No. 21. Later discussion with the Shift Supervisor revealed this had been previously reported by an auxiliary equipment operator. Apparently, an off-normal gate valve alignment (to permit diving operations near the adjacent, shut down circulating water pump) resulted in unusual flow conditions and the consequent noises. The condition was temporary.

d. During a tour in the Unit 2 reactor building cable tunnel on April 12, 1989, the inspector noted a plastic radiation controlled area sign propped above a fire extinguisher just inside fire door No. 323. This is not a radiation controlled area. There is such a controlled area in the cable tunnel, near some post-accident

sampling equipment, located some 180-degrees around the containment. The inspectors found trash in this area, apparently from work around and above the equipment, which had fallen inside the posted radiation and contamination control boundary. Radiation Protection group supervision was notified of the conditions and took prompt corrective action.

e. Plant material condition and housekeeping items were routinely reported to responsible plant personnel for appropriate followup action. For example:

(1) valve seal No. 0005410 was found broken and lying on the floor of the Unit 1 turbine driven auxiliary feedwater pump room;

(2) valve tag 1-FFS-260-V2 was found broken off and lying on the floor under the valve;

(3) several square feet of paint flakes peeled and fell off the ceiling in the turbine building chemical addition/retention tank area - some potential existed for the material to enter the retention tank and the floor drain system.

f. The inspector performed a preliminary followup review of Problem Report 89-384, which documented two consecutive trips of the Unit 1 west motor driven auxiliary feedwater pump (MDAFP) on April 1, 1989. The reactor was in MODE 6, but no fuel handling was in progress, when the west MDAFP was started to fill steam generators No. 11 and No. 14. The motor tripped on overcurrent on the first attempt. On restart, it was manually tripped with high flowrate observed. A third start attempt succeeded after the injection flow control valves were first closed, then partially reopened after the pump was running. The licensee's investigation was ongoing at the end of the inspection, so further NRC inspector review will be conducted as part of the routine ongoing inspection.

Questions to be addressed include:

(1) What (if any) system operating procedure was in use? Procedures 1-OHP 4021.056.001 and 1-OHP 4021.056.002 cover auxiliary feedwater standby readiness and operation during startup/shutdown, respectively, and both check the injection flow control valves closed before pump start.

(2) Was Operation Standing Order OSO-019, which provides for a maximum of two consecutive start attempts, in effect?

(3) Was the flow retention feature (to limit high flow in normal conditions) in effect and operating properly?

g. Unit 1 experienced an unplanned load shed signal on the "B" Train buses (T11 A&B) at 10:41 a.m. on April 1, 1989, because of a procedural error in cleaning the normal feeder breaker to Bus T11A. Opening the breaker door, per procedure, disconnected the potential transformer fuses for bus voltage, causing zero voltage to be sensed

on the bus. This satisfied the associated diesel auto start logic, which was not anticipated in the procedure. The diesel did not start, however, since it was out of service for testing. This condition also resulted in loss of power to the "W" RHR pump. The "E" RHR pump was in operation at the time and was unaffected. Reporting requirements of 10CFR50.72 were met and the event was documented for corrective action on Problem Report 89-406.

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

4. Maintenance (62703, 42700)

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. Job Order JO 726176: remove and inspect essential service water check valve ESW-101E per procedure **12 MHP 5021.001.021, "Disassembly, Repair and Reassembly of Centerline Split-Center Spring Loaded Check Valves".

b. Job Order JO 76129: 18-month inspection of emergency diesel generator 1CD per procedure **12 MHP 4030 STP.046, "Emergency Diesel Generator System 18-Month Inspection".

c. Job Order JO 722752: replace emergency diesel engine 1CD number 4 main bearing per design change RFC DC-2945, and procedure **12 MHP 5021.032.017, "Emergency Diesel Engine Main Bearing Removal, Inspection and Installation".

d. Job Order JO 721855: weld hangers and duct work for modification RFC-DC-2883 (diesel room ventilation) in 1CD diesel generator room. The inspector specifically verified compliance to various applicable "hot work" control requirements for this activity.

At the time of the inspection, about a dozen personnel were working around diesel 1CD on this and other activities. Discussions with a few of these personnel showed they were aware the diesel was OPERABLE and capable of auto-starting at any moment. The opposite train diesel (1AB) was inoperable at the time, so work around 1CD (including scaffold erection and work in one instrument panel) had

to have no impact on its operability. Those persons contacted by the inspector appeared to appreciate this.

Neither the Shift Supervisor nor the (Unit 1) Unit Supervisor, however, seemed clearly aware of the magnitude of the work in progress in the 1CD diesel room while the 1AB diesel was inoperable. The inspector contacted the Outage Manager, who immediately initiated a review which showed the approval for major scaffold erection had presumed the reactor core would be off-loaded before this work began. As this was not the case, the work was halted and the scaffolding removed. Problem Report No. 89-399 documented these circumstances (as an apparent work control breakdown) for corrective and preventive action. Other potential examples of job coordination or control problems were noted and likewise documented in Condition or Problem Reports. This was discussed at the Management Interview as an area of occasional weakness.

e. Job Order JO A007755: open and inspect 1AB diesel 5RB fulcrum box cover and repair injector or fuel line as necessary. The No. 5RB cylinder temperature was found to be off-normal as an extended engine run progressed, so an injector or fuel-line problem was suspected. Inspection showed a significant leak at the fuel line fitting to the injector, which was repaired (new line and fitting installed) under this Job Order and licensee procedure **12 MHP 5021.032.018, "Emergency Diesel Generator Fuel Injector Removal, Inspection and Installation".

f. Job Order JO 760152: preventive maintenance on 4KV circuit breaker 102 (North heater drain pump) per procedure **12 MHP 5021.082.001, "Inspection and Repair of 4KV Power Circuit Breakers". The procedure in use was Revision 6 dated June 1988; it had not incorporated vendor guidelines (which were present among the instructions on another sheet) for cleaning and relubricating the triggering mechanism in the breaker base. The licensee continued to find breakers which would not operate properly in "test" (no breakers had failed in service) because of binding of the triggering mechanism believed to be due to aging of the lubricant.

g. Design Change RFC-12-2927: replace original equipment station battery chargers with new. The inspector checked preparations for grouting-in the two new chargers for battery 1CD, verified proper security coverage for the opening cut through an adjacent (vital barrier) wall, and checked compliance to the requirements associated with "hot work" - cadwelding to ground. No problems were noted. The nearby battery room was toured, and the inspector noted the whole room, including the battery cells, leads and connectors, had a coating of dust, apparently concrete dust carried through the ventilation ducting. Plant management was advised of the conditions so the battery room would be included in post-job cleanup.

h. Job Order JO 726141: repair gasket/packing leak on Unit 1 North safety injection train safety/relief valve 1-SV-96 using procedure **12 MHP 5021.001.011, "Disassembly, Inspection or Repair, and Reassembly of Crosby Nozzle Relief Valves Style JO, JB, JMAK, JRAK

and JMAK-BS". The Job Order also provided for setpoint testing of the valve, which was not observed.

i. Job Order JO 751908: repair steam safety valve 1-SV-2B-2 per procedure **12 MHP 5021.001.005, "Main Steam Safety Valves SV-1, SV-2 and SV-3". This valve (1-SV-2B-2) was among thirteen Unit 1 valves selected for overhaul based on out-of-tolerance pressure setpoints (reference: Licensee Event Report LER315/89002-LL) and among three valves designated to be shipped to an offsite contractor for repeat pressure setpoint testing. Repairs included installation of selected new parts, including a new valve disc, even though there was no damage apparent on the disc which had been in service.

j. Job Order JO A012068: repair of fuel transfer system "conveyor at reactor" limit switch. The inspector observed the repair/replacement of the limit switch which is located on the containment side of the transfer canal. The repair of the switch required use of a diver since the reactor head was off and the cavity flooded. A video of the repair was made using a camera mounted on the diver's helmet. The inspector reviewed the survey sheet prior to the work and witnessed the entire evolution from establishment of the diver lay down area to rinsing and removal of the diver's suit. The process was completed expeditiously and safely with good teamwork and communications. The only problem observed was prior to the dive. A technician was sampling the water above the lower cavity when a rymple cloth was dropped into the water and sank to the bottom. The inspector was later informed by the diving coordinator that the cloth had been retrieved.

k. Job Order JO 722747: "Fabricate a New Front Plate and Support For The "E" MDAFP Portion Of Panel, RFC 2901". The inspector ensured the proper safety precautions were followed at the scene, including a properly charged fire extinguisher and an approved welding, burning, and grinding permit. This Job Order was used in conjunction with procedure 12 MHP 5021.082.081, "Conduit and Conduit Support Installation".

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

5. Surveillance (61726, 42700)

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 IHP 4030 STP.122: "Steam Generator 2 and 4 Mismatch Protection Set II Surveillance Test (Monthly)". Observations of data aquisition were made on the feed flow/steam flow loop 2 bistable. The inspector saw the "as-found" DC voltages were out of tolerance with the specified DC voltages stated in the procedure. If this happens, the procedure instructs the technicians to notify the instrument maintenance supervisor and to perform a separate calibration procedure (**2 IHP 6030 IMP.214) to determine whether a component is bad or the bistable setpoint drifted. The inspector checked to see if this was done and reviewed the findings. The problem was traced to a faulty steam density compensation module for which the plant had four spares. However, the spares had all been sent back to Foxboro, the manufacturer, because they too had failed in service. The plant ultimately removed a good module from Unit 1 (which is presently undergoing a refueling outage) and placed it in Unit 2. A better solid state system is scheduled to be installed in 1992.

b. **1 THP 4030 STP.217B: "DGAB Load Shedding and Performance". The inspector reviewed the portion of the procedure delineating the steps necessary to perform "Train B Safety Injection Without Blackout". This part of the procedure is designed such that the diesel generator (DG) will auto-start and operate on standby for five minutes. The inspector checked that the initial conditions, (including appropriate 10CFR50 Appendix R power requirements to support Unit 2) were being met. The inspector questioned two pen and ink entries on the procedure. One step (6.2.12) required a "DG 1AB Trips Disabled" alarm to be energized after resetting another relay. A handwritten note stated this was a procedural error and the alarm should be deenergized. Other steps (6.2.15.2 and 6.2.15.3) involved manipulation of the DG control switch and noting that an associated alarm clears. The handwritten note here described the two steps as unnecessary. The concern was that the procedure was being modified without review and consent by the appropriate safety review committee. When this was questioned, the reply was that Step 6.2.12 belonged in another section of the procedure for which a Change Sheet was ultimately reviewed and approved. The other "unnecessary" steps were found to be properly omitted, since the procedure permits this given certain conditions stated earlier in the procedure.

c. **IHP 6030 IMP.073: "Class IE Time Delay Relay Calibration".

d. **12 THP 6040 PER.126: "DMIMS - Operational Test".

e. **12 THP 6040 PER.353: "Fuel Assembly Inspection".

f. **1 OHP 4050 FHP.002: Section 2.6, "Reactor Vessel Stud Detensioning, Removal, Cleaning and Storage". The NRC inspector observed inspection of the stud cleaning process by a plant Quality Control (VT-3) inspector, to verify complete removal of traces of boric acid contamination on three studs. This was followed by proper lubrication and storage till reuse. The inspection focused on verifying the absence of stud damage.

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

6. Fire Protection (71707, 42700)

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.

a. The inspector reviewed procedure 1-OHP 4024.101, "Annunciator 101 Response - Plant Fire Systems", to screen the individual alarm instructions indicative of a potential fire. Instructions tended to fall into two categories:

(1) When fire suppression systems were shown to be activated, the "Immediate" action is to verify the existence of a fire, with the first "Subsequent" action to actuate the fire siren and assemble the plant fire brigade.

(2) When fire detection circuity is activated, but not fire suppression, the investigation to verify the existence of a fire is the first "Subsequent" action with fire brigade assembly later on if required.

This information was discussed with Operations Department management, and provided (informally) to the NRC Office of Nuclear Reactor Regulation.

b. On April 14, 1989, a contractor employee assigned to perform daily inspection of fire doors was observed violating radiation protection requirements associated with entry into the area containing of one of the doors to be inspected. During subsequent interviews with his management, the individual admitted he had not inspected the subject door (No. 422) on the previous four days (April 10-13, 1989) but he had signed off on inspection sheets as though he had.

A different inspector was assigned to reinspect all doors assigned to the subject individual. No problems were found. A plan for reinspection of items assigned to the individual for the month of April 1989 was developed. The individual was discharged from employment at D. C. Cook plant, and the NRC inspector was notified.

Technical Specifications 4.7.10.2.a (both Units) require verification each 24 hours of the position of each closed fire door; door 422 is such a fire door. Failure to perform the specified verification as required on April 10 through 13, 1989 is considered a violation of the referenced Technical Specification. The inspector's review determined this violation was licensee-identified and reported, it lacked safety significance, and it was neither repetitive nor preventable based on prior notice of a similar problem. Based on this determination, the criteria of 10 CFR 2,

Appendix C were met, such that no Notice of Violation should be issued pursuant to the NRC Enforcement Policy delineated therein.

One violation (not cited) and no deviations, unresolved or open items were identified.

7. Outages (42700, 60705, 60710, 86700)

The inspector reviewed licensee procedure **1-OHP 4050.FHP.001, "Refueling Procedure Guidelines" to check the adequacy of the plant's administrative requirements for control of refueling operations. This was done by verifying that the plant had established clear lines of supervision, proper shift manning, suitable radiological control requirements, and that requirements for equipment checkout were performed. Some minor problems were noted as follows:

a. The Refueling Organization Chart was not entirely accurate because the Outage Manager depicted on the chart was not current with information in a subsequent March 20, 1989 memo from the Assistant Plant Manager; also, the latter was more detailed.

b. The Refueling Contract Summary, which denotes plant specific responsibilities, was not in the correct place referenced in Section 1.2 of the procedure.

c. The listing of other procedures (referenced in Section 1.1) omitted the double asterisk which denoted that the procedure must be present at the job site.

d. Section 1.3 numbers 5 and 6 specify "periodically" when monitoring radiation levels of the refueling water instead of referencing a specific time frame. The applicable Radiation Protection (RP) procedures or specifications were not referenced.

e. QC hold points listed in Section 1.6 for Seal Ring Annulus Gap Measurement and Seal Ring Bubble Test were in reversed order when directed to the other procedure (**1-OHP 4050.FHP.002) referenced.

These examples were relayed to appropriate management for follow up. They suggest the plant must continue efforts to upgrade the clarity of their procedures.

Fuel handling activities (fuel offload) were observed in progress on April 8, 1989, from the control room and at the spent fuel handling and storage area. Procedure 1-OHP 4050 FHP.003 "Unit 1 Fuel Movement and Tool Checkout," was in use and was being properly followed.

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

8. Reportable Events(92700, 92720)

The inspector reviewed the following Licensee Event Reports (LERs) by means of direct observation, discussions with licensee personnel, and

review of records. The review addressed compliance to reporting requirements and, as applicable, that immediate corrective action and appropriate action to prevent recurrence had been accomplished.

a. (Closed) Licensee Event Report (315/88005-LL and 315/88006-LL): on July 5 and August 3, 1988, respectively, different "Cardox" fire suppression system headers were isolated without properly established compensatory measures in effect. Fire detection capability remained unaffected. The licensee had a previous history of errors/violations regarding administrative controls for the "Cardox" suppression systems (with a high of 13 LERs submitted in 1982) but no such events had occurred since 1985. The 1988 events differed from earlier events because they had in common the fact that the normal "master" isolation switches were inoperable, so multiple local switches had to be manipulated to secure and later to restore the systems. Corrective and preventive measures and evaluations were still in progress on the first event when the second occurred. These measures ultimately included improved and reinforced instructions for handling multiple local switches (individually documented and verified) as well as administrative discipline concerning the involved individuals.

   These events are examples of violations which were identified, reported and corrected by the licensee. They lacked safety significance and did not indicate that corrective actions for previous similar events were ineffective. As such, in accordance with the NRC Enforcement Policy (10CFR2 Appendix C) no written Notice of Violation has been issued concerning the matter.

b. (Closed) Licensee Event Report (315/88013-LL): Spurious reactor trip with concurrent loss of reactor coolant pumps. The nature of the trip implicated an intermittent failure of either the Train B underfrequency universal logic card or the Train B safeguards driver card. Both of these solid-state electronic components were replaced, as were the comparable Train A cards. Licensee testing (on site and corporate office) did not identify a root cause, so the components were returned to the manufacturer (Westinghouse) for analysis. The licensee will be informed of the findings.

c. (Closed) Licensee Event Report (315/88014-LL): design deficiency resulting in failure to relocate cables to meet Appendix R requirements. This matter was the subject of substantial NRC review as documented in Inspection Report No. 50-315/89004(DRS) and 50-316/89004(DRS). Based on further licensee evaluations of the reported conditions, this LER was withdrawn and NRC so notified on April 6, 1989. The licensee concluded the postulated failure mechanism was not credible; thus, design bases conditions were not violated.

d. (Closed) Licensee Event Report (315/89001-LL): wrong switch operated due to personnel error resulted in reactor trip. A licensed control operator, intending to valve steam into the Unit 1 startup air ejectors, opened the ejector outlet instead. This caused an essentially immediate loss of condenser vacuum

and a consequent turbine and reactor trip from 71-percent power. The licensee's investigation concluded the operator had conducted inadequate self-checking. Contemplated administrative actions for the involved operator were negated when he resigned.

Plant initial response to the trip was nominal, but one auxiliary feedwater valve would not reclose until the pump was first shut down. The licensee increased the torque switch settings for the like valves, within a previously determined acceptable range, and committed to follow up with further testing (and inform NRC of significant findings) during the March 1989 refueling shutdown. This additional testing yielded no significant findings.

A training case study (for operator requalification) is being developed on this event. Further, a control switch labeling "human factors" review was conducted and labeling improved.

One violation (not cited) and no deviations, unresolved or open items were identified.

9. Region III Requests (92705)

a. The inspector received a Region III request to obtain an inspection schedule of Anchor Darling check valves. The Region's concern stems from a problem described in NRC Information Notice 88-55, involving intergranular stress corrosion cracking of retaining block studs in check valves manufactured by the company. The licensee provided a list of about nine valves in Unit 1 which the plant staff intends to inspect during the current refueling outage. The list was forwarded to Region III.

b. The inspector received a Region III request concerning Westinghouse steam generator tube plugs that Westinghouse says are susceptible to stress corrosion cracking and that have been used to plug tubes in 20 to 25 plants throughout the United States. The plugs are believed to have been fabricated from two batches with low mill anneal temperatures. The D. C. Cook plant used some of the plugs in the "old" Unit 2 steam generator tubes but these tubes have since been replaced. None of the plugs are known to be in Unit 1. This information was forwarded to Region III.

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

10. Followup on Problems/Events (93702)

The inspector received notification of licensee findings or events and reviewed licensee classification, reporting (if required), followup evaluation and corrective/preventive actions as applicable. As requested, information was developed and conveyed to interested parties in NRC Region III by both written and telephoned reports.

a. Problem Report 89-244: The licensee made an Emergency Notification System (ENS) notification, pursuant to 10 CFR 50.72, on February 27, 1989, concerning the unanalyzed storage of

calibration weights in the respective containment ice condensers. This matter was discussed in Inspection Report No. 50-315/89009(DRP); 50-316/89009(DRP). Subsequent evaluations concluded design basis functions of the ice condensers were not compromised. This resulted in classification of the findings as not reportable per 50.73 (Licensee Event Report) and the 50.72 ENS notification was withdrawn on March 30, 1989.

b. Problem Report 89-360: On March 27, 1989, the licensee discovered boric acid residue on the Unit 1 reactor vessel head between head studs 5 and 16. Cleanup and inspection of the studs is discussed in Paragraph 5.f above. The head was also cleaned (and found undamaged) and the leak was traced to a canopy seal weld on a "spare" guide tube. Leaks of this nature have been previously experienced at other Westinghouse pressurized water reactors. An approved repair method (marketed by Combustion Engineering Co.) was in progress at the conclusion of the inspection.

c. Problem Report 89-406: The licensee made a 50.72 ENS notification on April 1, 1989, when an unanticipated diesel load-shed signal actuated - see Paragraph 3.g above.

d. Problem Report 89-411: The licensee made a special environmental notification via ENS on April 5, 1989, upon discovery of a small leak in the Unit 2 Northeast turbine lube oil cooler. Oil lost through the leak would be carried into Lake Michigan by the cooling (nonessential service water) system. A light oil slick was reportedly visible for part of the day. The licensee isolated the leaking cooler, reported as required, and initiated a review which was followed by the inspector.

   Because another of the four Unit 2 coolers (Southeast) had experienced a previous leak on February 27 (see Inspection Report 50-315/89009(DRP); 50-316/89009(DRP)) tube inspections are planned for all tubes in all four coolers. Further review also established about 100 gallons were leaked to Lake Michigan, versus up to 600 gallons as originally estimated. The corrected value was included in the written report to environmental authorities.

e. Problem Report 89-430: On April 10, 1989, two switches, on a local inverter panel in the 1CD emergency diesel generator room, changed position from "on" to "off". A control room annunciator (Inverter failure) actuated at about 12:05 p.m. alerting operators to the condition. At the time, Unit 1 was shut down and all fuel had been removed. The 1CD diesel was in operation for testing; it was paralleled to its bus, and was carrying design load of 3500 KW. Operation of the diesel was not affected nor, considering switch functions, should it have been. Six persons from three work groups were in the diesel room, engaged in various jobs.

   An immediate inspection of the inverter panel suggested no agency for the switch movement other than manipulation by one of the persons in the room. The duty Shift Supervisor consulted with site Security and they determined at about 2:30 p.m. that the event

should be reported as "tampering". An ENS notification to that effect was placed within the hour.

Security inspectors from NRC Region III were coincidentally onsite, and they followed the licensee's investigation on an essentially continuous basis. Evaluation of this event by Region III will be documented in a Safeguards inspection report. The Federal Bureau of Investigation became involved and conducted interviews of persons identified through licensee research as having been in the room at the time of the event. No perpetrator was identified, nor was a mechanistic explanation achieved.

During the week-long investigation, persons implicated by virtue of their presence in the room were barred from site access and employment. Thereafter, those (two) whose services were still needed were authorized to return.

f. Problem Report 89-434: When the Unit 1 CD diesel was unloaded at the end of a 24-hour maintenance run at about 5:40 p.m. on April 10, 1989, the engine speeded up instead of settling at the idle speed of 514 rpm. When the control room operator observed frequency increase above 65 Hz and verified by radio contact with an equipment operator in the diesel room that the local tachometer showed offscale above 600 rpm, he tripped the machine and it shut down. Smoke and unusual noises were developing in the diesel room by the time the machine was tripped (approximately 30 seconds after unloading) and vibrations were detectable in the main control room, two floors above.

Subsequent inspection of the engine found no serious damage, though the crankshaft bearings were replaced (they had to be removed for inspection) as a precaution. There was some thrust bearing babbit wear, and the base vibrated out of alignment. Repairs and realignment were completed at the end of the inspection, but a test run is pending return-to-service of the associated emergency service water system, on which other maintenance was in progress. The demonstration test run will be subject to ongoing routine inspection.

g. Problem Report 89-383: On March 31, 1989 the licensee identified a nonconservative error in the computer calculated plant heat balance, which is used to set and monitor reactor nuclear power output within the respective Unit's licensed power limit. Unit 2 was operating at "full" power at the time, and power was immediately reduced pending results of investigation to quantify the error.

The nonconservatism involved how steam generator blowdown was accounted for. Neither Unit has installed blowdown flow instrumentation, so a series of tests (conducted in about 1985) were performed to estimate flow based on blowdown valve position. Two discrete values were chosen for input to the computer calculation on heat balance, one for less than 50-percent blowdown flow and one for greater than 50-percent flow. The value used in the latter instance is that derived at 100-percent flow. Whenever

blowdown flow is below 100-percent (but above 50-percent) this yields a nonconservative result. Blowdown flow exits the steam generator as liquid, carrying substantially less energy per pound than steam. Overestimating blowdown (liquid) mass flow will result in underestimating steam mass flow, because the sum of the two must equal flow feed. A 60-gpm underestimate (per steam generator) in the amount of feed flow heated by about 800 BTU/lb (to steam) versus about 110 BTU/lb (to blowdown) could result. This is equivalent to about 0.4 percent rated thermal power.

At the conclusion of the inspection, the licensee investigation to identify the magnitude and duration of any actual violations of the licensed thermal power limits, was continuing. A Licensee Event Report is anticipated, which will be reviewed further during a future inspection.

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

11. Management Interview (30703)

The inspectors met with licensee representatives (denoted in Paragraph 1) on April 27, 1989, to discuss the scope and findings of the inspection. In addition, the inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.

The following items were specifically discussed:

a. The Licensee's occasional weaknesses in coordination or control of multiple activities, as evidenced by problems identified by the inspector and by the licensee (Paragraph 4.d).

b. The licensee-identified violation of Technical Specification daily inspection requirements for fire doors, which resulted from an inspector documenting inspections he did not perform (Paragraph 6.h).

c. The inspector characterized the licensee's reporting of potential problems to NRC, where timeliness is not sacrificed for the purpose of exhaustive advance investigation of a situation, as a program strength (Paragraph 10.).