U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/91010(DRP); 50-316/91010(DRP)

Dockets No. 50-315; 50-316 . Licenses No. DPR-58; DPR-74

Licensee: 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, Michigan

Inspection Conducted: March 20 through April 30, 1991

Inspectors: J. A. Isom
D. G. Passehl

Approved By: [signature] for B. L. Jorgensen, Chief
Projects Section 2A

5/16/91
Date

Inspection Summary

Inspection from March 20 through April 30, 1991 (Reports No. 50-315/91010(DRP); No. 50-316/91010(DRP))
Areas Inspected: Routine unannounced inspection by the resident inspectors of: plant operations; maintenance/surveillance; engineering and technical support; radiological controls; actions on previously identified items; safety assessment and quality verification; and, NRC Region III requests. Management meetings were held at the site between NRC and licensee representatives on April 2 and 17, 1991.
Results: Of the seven areas inspected, no violations or deviations were identified in six areas. One violation was identified (inadequate post-maintenance testing - Paragraph 3.a) in the maintenance/surveillance area.

The inspection identified a weakness in the post-maintenace test in the maintenance area and a weakness in the operator's knowledge of the operation of the liquid in-line rad monitor system (RS-1000). There were no notable weaknesses identified in any of the other areas reviewed.

Plant Operations:

During this reporting period, both Unit 1 and 2 operated essentially at 100 percent power with no major operational problems. On April 19, 1991, Unit 1 entered a short duration outage to repair the Unit 1 main transformer and to perform other maintenance activities.

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Maintenance and Surveillance:

The inspector's review of the surveillance and maintenance activities during this reporting period found that most maintenance and surveillance activities were performed satisfactorily. One problem was identified with improper reassembly and inadequate post-maintenance testing on the charging system Appendix R cross-tie isolation valve.

DETAILS

1. Persons Contacted

   a. Management Meeting - April 2, 1991

      American Electric Power/Indiana Michigan Electric

      E. E. Fitzpatrick, Vice President, Nuclear Operations, AEPSC
      T. O. Argenta, Assistant Vice President, Nuclear Engineering, AEPSC
      P. A. Barrett, Director, Quality Assurance, AEPSC
      A. A. Blind, Plant Manager
      J. E. Rutkowski, Assistant Plant Manager, Technical Support
      K. R. Baker, Assistant Plant Manager, Production
      B. A. Svensson, Executive Staff Assistant
      R. F. Kroeger, Division Manager, Electrical Systems, AEPSC
      J. A. Kobyra, Group Manager, Nuclear Design, AEPSC
      L. H. Vanginhoven, Supervisor, Site Design
      J. B. Kingseed, Senior Engineer, Nuclear Safety and Licensing, AEPSC
      R. A. Green, Engineer, Nuclear Safety and Licensing, AEPSC

      NRC Regulatory Commission (NRC)

      A. B. Davis, Regional Administrator, Region III
      C. J. Paperiello, Deputy Regional Administrator, Region III
      H. J. Miller, Director, Division of Reactor Safety, Region III
      J. A. Zwolinski, Assistant Director for Region Reactors, NRR
      M. A. Ring, Chief, Engineering Branch, DRS, Region III
      H. B. Clayton, Chief, Branch 2, Division of Reactor Projects, RIII
      J. A. Isom, Senior Resident Inspector
      T. G. Colburn, Licensing Project Manager, NRR
      E. R. Schweibinz, Senior Project Engineer, DRP, Region III
      D. G. Passehl, Resident Inspector
      W. D. Pegg, Intern, NRR

   b. Management Meeting - April 17, 1991

      American Electric Power/Indiana Michigan Electric

      D. H. Williams, Jr., Senior Executive Vice President, AEPSC
      T. O. Argenta, Assistant Vice President, Nuclear Engineering, AEPSC
      S. J. Brewer, Manager, Nuclear Safety and Licensing, AEPSC
      A. A. Blind, Plant Manager
      L. S. Gibson, Assistant Plant Manager-Projects
      K. R. Baker, Assistant Plant Manager-Production
      J. E. Rutkowski, Assistant Plant Manager-Technical Support
      R. A. Green, Engineer, Nuclear safety and Licensing, AEPSC

Nuclear Regulatory Commission (NRC)

K. M. Carr, Chairman
A. L. Vietti-Cook, Chairman's Technical Assistant
C. J. Paperiello, Deputy Regional Administrator, Region III
J. A. Isom, Senior Resident Inspector
D. G. Passehl, Resident Inspector
E. E. Hayden, Public Affairs staff

c. Routine Inspection

*A. A. Blind, Plant Manager
J. E. Rutkowski, Assistant Plant Manager - Technical Support
*L. S. Gibson, Assistant Plant Manager - Projects
*K. R. Baker, Assistant Plant Manager - Production
*B. A. Svensson, Executive Staff Assistant
*J. R. Sampson, Operations Superintendent
P. F. Carteaux, Safety and Assessment Superintendent
T. P. Beilman, Maintenance Superintendent
*T. K. Postlewait, Design Changes Superintendent
*L. J. Matthias, Administrative Superintendent
J. T. Wojcik, Technical Superintendent - Physical Sciences
*M. L. Horvath, Quality Assurance Supervisor
D. C. 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 the Management Interview on May 3, 1991.

2. 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.

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, and the degree of professionalism of control room activities. The Plant Manager, Assistant Plant Manager-Production, and the Operations Superintendent were well-informed on the overall status of the plant, made frequent visits to the control rooms, and regularly toured the plant.

Evaluation, corrective action, and response to off-normal conditions or events, were examined. This included compliance with 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.

a. Unit 1 began the inspection period at 100 percent power and operated routinely until April 19, 1991, when a planned 19 to 27 day outage began to repair or replace, if necessary, the main transformer due to elevated levels of combustible gas. The outage was also planned to repair a body-to-bonnet leak on Chemical and Volume Control System valve 1-CS-536. The main transformer was in the restoration phase following repair at the end of this inspection period. Other major activities that were accomplished included replacement of the East Essential Service Water Pump, material condition upgrades of the Emergency Diesel Generator CD, replacement of the West Centrifugal Charging Pump Lubricating Oil Pump, balance of the No. 13 Reactor Coolant Pump, and replacement of the Emergency Boration Flowpath to Charging Header Suction valve 1-QMO-410. The outage appeared to be well managed and all of the scheduled activities were completed as intended. The inspector accompanied licensee personnel on the containment closeout tour and noted minor external boric acid leakage on some valves. The licensee evaluated and wrote job orders to address these. The outage was slightly ahead of schedule at the close of the inspection period, with the unit in MODE-3 and with startup testing in progress.

b. Unit 2 operated routinely at 100 percent power throughout the inspection period. There were no significant power reductions throughout the period.

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

3. Maintenance/Surveillance (62703), (42700), (61726)

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 inspector also reviewed Technical Specification 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. The inspector's review of a corrective maintenance activity documented on Job Order A49131 for valve 1-CS-536 (Unit 1 Chemical and Volume Control System (CVCS) to Unit 2 CVCS discharge header), and his discussion with the licensee's maintenance staff on the adequacy of the subsequent post-maintenance test, found that because inadequate post-maintenance testing was performed on 1-CS-536, significant body-to-bonnet leakage was not identified, which placed both units in a 60 day Limiting Condition for Operation (LCO). The LCO was scheduled to expire on April 28, 1991.

Valve 1-CS-536 is a four inch Conval Clampseal valve and is required to be manually cycled during a fire as postulated in 10 CFR 50 Appendix R, to support the shutdown functions of Unit 2. During the 1990 Unit 1 refueling outage, valve 1-CS-536 was found to be leaking past its seat. Consequently, the valve was disassembled and the valve disc and seat were repaired. The inspector's discussion with the licensee maintenance staff indicated that during reassembly of the valve, the "timing shim" may have been cocked in such a way as to prevent an adequate body-to-bonnet sealing surface. The inadequate sealing of the body-to-bonnet was not found during post-maintenance testing of the valve in December of 1990, because the specified post-maintenance test for leak inspection was done with the valve in the closed position. Because of valve design and the source of the hydrostatic test medium used, the pressure which would have identified a leaking body-to-bonnet joint was isolated from this region of the valve with the valve closed. Although another test was performed which cycled the valve to verify its position indicator on the reach rod, when this test was performed, there were no requirements to have the valve pressurized, nor was it pressurized because of other unrelated circumstances. As a result, no pressure was applied to the valve when it was cycled and therefore leakage from the valve body-to-bonnet area was not detected.

However, on February 27, 1991, during cycling of opposite Unit 2 crosstie valve 2-CS-536 after a packing adjustment, a significant body-to-bonnet leak was identified on 1-CS-536 (see NRC Inspection Report 50-315/91004(DRP); 50-316/91004(DRP)). When 2-CS-536 was cycled, full discharge pressure from the Unit 2 charging header was applied to the body-to-bonnet region of 1-CS-536, which was not adequately sealed, and subsequently leaked. Because of this leak, the licensee conservatively declared valve 1-CS-536 INOPERABLE. The problem placed Unit 2 in a 60 day Limiting Condition For Operation (LCO), expiring on April 28, 1991.

Although the licensee initially intended to repair valve 1-CS-536 at power and submitted a Temporary Waiver of Compliance Request to the NRC to avoid a shutdown of Unit 1, this request was retracted. The licensee chose to repair the valve during the planned Unit 1 outage in which repairs to the main transformer were planned. The repair to 1-CS-536 was completed with the unit in MODE 5, during the beginning of the outage.

The inspector's review of the job order and interviews with the workers during the repair of 1-CS-536 found that the work was performed satisfactorily. The only problem experienced by the licensee was that the replacement valve's bonnet and yoke assembly had threads that would not properly engage the threads on the existing body, so the bonnet and yoke assembly of the old valve were re-used. The licensee had anticipated this contingency. The maintenance staff did use the stem assembly and packing cartridges from the new valve. A small amount of lapping was also performed on the seat in the body of the "old" valve due to slight scoring. The reassembly was completed and proper post-maintenance testing was satisfactorily performed. Valve 1-CS-536 was returned to OPERABLE status on April 21, 1991.

The inspector noted that unlike the December 1990 test, the post-maintenance test for the repair of 1-CS-536 completed on April 21, 1991 included an ASME Code VT-2 examination. The VT-2 test consisted of a visual inspection for external leakage, under normal operating pressure, with the valve in the open position. The inspector noted the results of the VT-2 examination indicated zero external leakage. Also, the inspector noted acceptable post-maintenance test results for internal leak by and valve cycling.

10 CFR 50, Appendix B, Criterion XI, as implemented by the D. C.Cook Updated Quality Assurance Program Description, Section 1.17.11 (Test Control), requires that post-maintenance test prerequisites be specified in test procedures and in the post-maintenance tests that are performed in accordance with established programs to demonstrate that structures, systems, and components will perform satisfactorily in service. The failure in December of 1990, to establish the necessary post-maintenance test prerequisite to pressurize the body-to-bonnet region and verify Code pressure boundary integrity, is an apparent violation of 10CFR50 Appendix B, Criterion XI, (Violation 315/91010-01).

b. The inspector reviewed a licensee work activity documented on Job Order A57382, associated with the Unit 1 Emergency Boration Flowpath Valve 1-QMO-410. The valve tripped on thermal overload during a weekly surveillance test to check the emergency boration flowpath for blockage. During the test, the valve had failed to indicate the full open position, and Maintenance Department personnel found upon investigation that the valve disc had jammed into the seat. The cause of the problem was a too high torque switch setting. The licensee is still investigating whether the torque switch was mispositioned or had drifted from the proper setting.

Motor operated globe valve 1-QMO-410 controls the flow of fluid from the boric acid transfer pumps to the emergency boration line. The valve is operated to initiate emergency boration flow directly to the suction of the charging pumps.

The inspector reviewed the procedure **12 MHP 5021.001.009, "Disassembly, Inspection, Repair and Reassembly of Velan Manual and Motor Operated Gate Valves" (rev.3), which was used to work the valve. The procedure was used for disassembly and reassembly of the valve only, and was found to be properly documented. However the inspector noted that the procedure was written for work associated with a gate valve, and 1-QMO-410 is a globe valve. The inspector questioned whether a more appropriate procedure to use would have been **12 MHP 5021.001.052, "Inspection and Repair of Hand and Motor Operated Velan Globe Valves." The licensee replied that procedure .052 is used for work associated with bonnetless valves, and that the database the plant uses to prepare such jobs specified that procedure .009 be used. Procedure .009 was used only to disassemble and reassemble the valve and was adequate for those purposes. However, it also appears the licensee does not have an adequate procedure to address inspection and repair of globe valves with bonnets like 1-QMO-410. The licensee replied that procedure .009 would be modified to address Velan globe valves. The modifications would apply only to the section of the procedure that addresses the plug and seats of the valve. Upon disassembly the valve was determined to be irrepairable, and a spare valve was unavailable from the licensee's stock. A search was begun for a suitable replacement valve, which was finally obtained through Westinghouse. A modification package was prepared as the licensee was unable to procure an exact replacement. The upstream and downstream piping was modified to allow the valve stem to sit vertically. Some pipe supports were also re-configured. A post-modification hydrostatic test and valve stroke for Inservice Testing were performed and the results were satisfactory. The post-maintenance tests for leakage and valve position indication were performed with satisfactory results. The inspector reviewed the Operations Department surveillance procedures for the Boration Flowpaths, which included a functional test of 1-QMO-410. The results of the surveillances were satisfactory, and all acceptance criteria were met.

c. The inspector observed corrective maintenance on valve 2-MMO-220 (3-way selector valve for No. 22 steam generator main steam stop valve) and reviewed Job Order B21616, which was written to document the activity. The maintenance activity involved a repack of the valve because of excessive packing leakage. Valve 2-MMO-220 is used for testing the two pneumatically-operated dump valves associated with no. 22 steam generator main steam stop valve (MSSV). The review found that the corrective maintenance was performed satisfactorily. Post-maintenance testing for leak inspection and valve stroke was also performed satisfactorily and all acceptance criteria were met. The MSSV was returned to OPERABLE status within the time frame allowed by the Technical Specification Limiting Condition for Operation (T/S LCO).

The licensee decided to work the valve as part of the attempt to reduce the large backlog of open job orders, roughly half of which were written to address leaking valves. The Maintenance Department is in the process of forming a "valve improvement team" to address valve problems. The packing leak was not of a magnitude that would have caused inadvertant closure of the MSSV, nor did it appear to have any other noticeable negative affects on the MSSV.

The licensee made a voluntary four hour T/S LCO entry to repair the valve, because one of the MSSV dump valves had to be isolated to do the work. The valve was repaired and tested satisfactorily within a period of about three hours. The other dump valve could have lifted and closed the MSSV upon receipt of the appropriate actuation signal, but the valve was assumed not to function when required because of single-failure considerations.

d. The inspector observed corrective maintenance on components associated with the Unit 1 East Motor-Driven Auxiliary Feedwater Pump (EMDAFP). Job Orders (JOs) A3507 and A53054 were written to document the activity and were also reviewed. The work involved a repack of EMDAFP discharge valve 1-FW-130 (JO A3507) and repair of an oil leak on the pump inboard bearing (JO A53242). The observations and reviews found the work was performed satisfactorily within the time constraints allowed by the Technical Specification Limiting Condition for Operation (T/S LCO). Post - maintenance testing was also performed satisfactorily and all acceptance criteria were met. The pump was INOPERABLE for 15 hours 29 minutes, which was within the 72 hour T/S LCO Action Statement.

The packing leak on 1-FW-130 was noted to be approximately 100 drops per minute with the pump running and was discovered during a run of the EMDAFP during emergency diesel generator load sequence testing in October 1990. The problem was not addressed during the outage because it was not identified until the work package "window" on the EMDAFP had been essentially closed. Thereafter the problem was not significant enough, according to the licensee, to warrant removal of the pump during plant operation unless other jobs needed to be performed. The packing leak represented an insignificant amount of water inventory withheld from the steam generators. The inspector noted no problems with the work and noted that the job order was properly documented. The post-maintenance test consisted of a leak inspection and stroke check of the valve, and the results were satisfactory. Additionally, no leaks were noted during the monthly surveillance run that was performed after the work and prior to the pump's OPERABILITY declaration.

The magnitude of the oil leak on the inboard pump bearing was slight, according to the licensee, as evidenced by the oil drops found below the bearing on the pump skid. This problem was discovered by an operator while making tours of the plant in January, 1991. This work item also was not significant enough to warrant removal of the pump from service during plant operation, and was worked with the repack job described above to minimize the amount of time the pump was removed from service. Operators monitor the oil level in the bearing via a sight glass on a shiftly basis. No instances of unacceptable oil level were noted during tours by the plant operators. A large oil leak would cause problems if left unchecked and could stall the pump. The repair work involved slight adjustment to a "slinger ring", which rides on the pump shaft with a close tolerance to the face of the bearing housing, and serves to redirect any escaping oil back into the bearing housing sump. An oil level adjustment mechanism was also set because the oil level in the bearing sump was slightly high, and may have contributed to the leak problem. The post-maintenance test consisted of a leak check with the pump in operation, and again no problems were noted.

The inspector reviewed the surveillance test documentation for the EMDAFP that was performed just after the maintenance work described above. This scheduled monthly test was also performed to verify OPERABILITY of the EMDAFP in accordance with the Technical Specifications, which included verification of the correct position of all valves in the flowpath. The inspector found the surveillance procedure, **1-OHP 4030.STP.017E, Rev.5, "East Motor Driven Auxiliary Feedwater System Test", to be complete and noted no problems. The procedure instructions were clear and all data was properly documented. All acceptance criteria were met.

One violation, and no deviations, unresolved or open items were identified.

4. Engineering and Technical Support (37701, 37828)

The inspector monitored engineering and technical support activities at the site and, on occasion, as provided to the site from the corporate office. The purpose of this monitoring was to assess the adequacy of these functions in contributing properly to other functions such as operations, maintenance, testing, training, fire protection and configuration management.

a. The inspector reviewed the results of the licensee's evaluation of degradation found with the incore flux thimble tubes during eddy current examinations performed during the 1990 refueling outages. The results confirmed the licensee's suspicion of flow induced vibration as root cause. The flow induced vibration was believed to have occurred at the lower core plate area where the vibrations would be most prominent. The Unit 1 tube wear was not as pronounced as that found in the Unit 2 tubes, which the licensee believed was probably due to the different flow characteristics of the two units. The licensee plans to perform some type of corrective action during the 1992 refueling outages, in an attempt to reduce the wear rate. Several technologies are presently being investigated. The licensee is tending toward application of a wear resistant coating to the surface of the tubes, to improve the lifetime of the tubes while minimizing the risk of increasing the vibrations.

The Unit 2 inspections were performed in the Summer and Fall of 1990, and resulted in the replacement of 10 tubes and the reposition

of 19 tubes. The Unit 1 inspections were performed in the Fall of 1990, and resulted in the reposition of 29 tubes. The licensee made various submittals to NRC at the time describing the eddy current examinations and results. The licensee, accompanied by representatives from Westinghouse, made a presentation to NRC at the Headquarters office on April 11, 1991 to summarize the results of the root cause investigation. To support the root cause investigation, two of the degraded Unit 2 flux tubes were shipped to a hot cell facility for examination.

Additionally, the inspector noted that on March 12, 1991, four isolation valves on the Unit 2 flux mapping system were closed as a proactive means to reduce the possible damage to the flux mapping system should those tubes experience a leak. Three of the four thimbles that were isolated (C-7, A-9, and K-2) corresponded to the tubes that exhibited the most degradation. The remaining thimble (B-13) was isolated due to its inaccessibility, which was discovered during containment closeout activities during the last refueling outage. The isolation of the four tubes is not significant from a Technical Specifications (T/S) standpoint. The T/S requires 75 percent of the tubes (or 44 total) be OPERABLE; there are currently 54 OPERABLE tubes remaining.

Following cleaning and testing of the system, the licensee found they were unable to run a detector through thimble B-13 to the top of the core. The licensee believed the blockage was related to the leak in thimble C-7 that was identified on June 18, 1990. The steam formed in C-7 at the time of the leak may have caused some slight drainage of oil from the associated ten-path gear box, which may have left an oil residue in the B-13 tube that the cleaning process did not remove. The licensee stated that in the event that one of the thimbles (except B-13) be needed for a rod position determination, the isolation valve could be re-opened for the map and then isolated. The thimbles were to remain isolated at all other times.

b. The inspector reviewed the program and the results of the licensee's zebra mussel control strategy. The program was reviewed because treatment procedures using the molluscicide "Clam-trol" had begun this inspection period for the control of the mussels in the Service Water and Fire Protection Systems. The licensee reported good results with the Clam-trol treatments, based on mortality rates of about 95 to 100 percent in the nonessential service water (NESW) and essential service water (ESW) systems in both units. Treatments to the Fire Protection System were judged to be 100 percent effective. The licensee obtained some suspect data while treating a part of the Unit 1 NESW and the Unit 2 ESW system because of flow adjustment problems through the sample points, and in these cases results were conservatively estimated to be roughly 80 percent, which was still judged acceptable. The acceptance criteria for mussel mortalities has not been rigorously established, and will become more refined as the licensee gains more experience in doing these treatments.

The treatment was timed for the present period in order to assure "clean" Service Water and Fire Protection Systems, in preparation for a May 1991 chlorine treatment, which will be performed for scale and algae control as the lake water temperature rises. The chlorine treatment also prevents settlement of veligers (free swimming zebra mussel larvae), but it does not kill existing adult mussels. The licensee's basic strategy for the zebra mussel control is a two part program that includes a plan to eradicate existing populations within the plant's raw water systems, and a control program to either kill or hinder settlement of veligers, juveniles, and adult mussels within the systems. In order to monitor the treatment results, the licensee connected "bioboxes" to the treated systems at various sample points. The bioboxes were then seeded with zebra mussels for an acclimation period prior to the Clam-trol treatment, and afterwards monitored for extermination. Because the licensee has not yet detected any significant numbers of zebra mussels in their water systems, the mussels for seeding the bioboxes had to be obtained elsewhere, in this case Lake Erie. Program upgrades are still being investigated which would provide for more accurate assessments of mussel population density and distribution.

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

5. <u>Radiological Controls (71707)</u>

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.

a. The inspector reviewed a March 8, 1991 event when a sampled but unmonitored liquid release occurred. The problem involved a release of the contents of the No. 4 Monitor Tank, which is part of the Waste Disposal System. In accordance with the licensee's procedures, the tank was isolated and properly sampled for release; however, the in-line monitor (RRS-1000) apparently "locked-up" in a way that valve 12-RRV-285 (Radioactive Liquid Waste Disposal to Discharge Tunnels Shutoff) should have received a closure signal which would have isolated and terminated the liquid discharge. The event apparently resulted in a violation of Technical Specification 3.3.3.9. The inspector noted that although the release was well below the 10 CFR20 Maximum Permissible Concentration (MPC) limits, there was a lack of operator knowledge about the system. Because the system is complex, the licensee took appropriate steps to lessen the burden on operators to help avoid future mistakes.

   The Technical Specification required, in part, that with an INOPERABLE in-line monitor, at least <u>two</u> independent samples be analyzed for radionuclide makeup and concentration prior to release. The licensee believed the monitor was OPERABLE during the release, and discovered just as the release was terminated that the monitor in fact was INOPERABLE. The licensee reported the event to the NRC in Licensee Event Report (LER) 315/91003.

The licensee's analysis of the sample showed that the Maximum Permissible Concentration (MPC) value released was about 3.70E-4, which was below the 10CFR20 limit of 1.00 MPC. The primary cause of the event was attributed to a crushed detector cable associated with RRS-1000. The licensee was unable to determine how or when the cable was crushed. A secondary cause of the event was operator failure to recognize the inoperability condition of the monitor.

The problem occurred when Operations personnel began the four hour liquid waste discharge. About one half hour into the discharge, operators received an "external failure" status alarm, which automatically terminates the release, and is entered when sample flow is out of the normal range. It is usually indicative of sample flow adjustment problems. In accordance with the procedure **12-OHP 4021.006.004, "Transferring Distillate From Monitor Tank", the release was re-started and sample flow was re-adjusted. About one half hour later, the release automatically terminated again because of a flow adjustment problem. The RRS-1000 monitor then made several status changes between "external failure" and "hi fail". The hi fail alarm should have provided a trip signal to the discharge isolation valve (RRV-285), and should not have allowed restart of the release. An operator monitoring the release erroneously reasoned the hi failure alarm was invalid because the detector response appeared normal and below the high alarm setpoint. The licensee later determined the hi fail alarm was valid, as evidenced by the monitor values given on the printout that were obtained at the conclusion of the discharge.

To prevent recurrence, the release procedure was upgraded and would require additional channel checks during the release that would help confirm abnormal conditions and ensure proper operation of the monitor. A requirement was also added that operators would terminate release upon receipt of <u>any</u> alarm, including a trend alarm. A preventive maintenance program was also developed for the monitor. The crushed detector cable was replaced and the circuit boards were removed, inspected, and reinstalled. No problems were noted that required replacement of the circuit boards.

This matter will be reviewed further during followup on the referenced Licensee Event Report.

b. On April 2, 1991, two maintenance instructors were exploring the plant scrapyard for items that could be incorporated into their program as training aids. They discovered a Reactor Coolant Pump Seal insert that appeared to have been installed at one time. The men took the insert into the Training Building where a Radiation Protection Instructor surveyed it and found a small amount of fixed contamination. The plant radiation protection staff was notified of the incident and an investigation commenced.

The seal insert was confiscated and personnel cordoned off the area of the scrapyard where the piece was found. An extensive survey of the Training Building was conducted and no radiation or contamination levels greater than background were found. Seven additional items with small amounts of fixed contamination were found in the same area of the scrapyard as the insert. No removable contamination was detected. Numerous soil samples were obtained from the scrapyard and no activity greater than background was detected. Well water sample documentation was researched and no activity above background was noted. The contaminated items have been removed from the scrapyard and were taken to the Auxiliary Building. The affected area of the scrapyard was surveyed and no further contamination was found.

The investigation determined that the contaminated items were removed from the Auxiliary Building in the mid to late 1970's. The plant's release criteria for radioactive material were not as conservative then as they are now. The requirement now is that no material can be released if there is any detectable radioactivity present.

According to the licensee, this incident presented no exposure hazard to plant employees or the general public. No removable contamination was detected and all soil and water sample data indicated no activity above background. A full description of the event was given to NRC Region III Radiation Specialists for followup action.

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

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

The inspector reviewed the following six inspection findings from the NRC Emergency Operating Procedure (EOP) Inspection Team. The EOP inspection was conducted from July 5-15, 1988. The review of the licensee's response to these findings from the EOP inspection involved direct observation, discussion with licensee personnel and review of records.

a. (CLOSED) EOP Inspection Finding 316/88017-01: The EOP inspection team found through in-plant and control room walkthroughs of the emergency and abnormal procedures listed in Appendix A of the report that instrumentation and control labeling on the control board and the nomenclature used in the procedures were inconsistent. The discrepancies determined by the inspection team to be significant were identified in Appendix C of the EOP report. The EOP inspection team recommended that the licensee review and resolve not only those discrepancies identified in Appendix C, but also perform a procedure/control board labeling review and evaluate all discrepancies.

   The inspector's discussion with the Operations department staff found that all discrepancies identified in Appendix C of the report were corrected. Additionally, procedure/control board labeling review was completed in May and June 1991 for Unit 1 and Unit 2 respectively, and all significant labeling discrepancies identified from this review were corrected. The inspector also performed an independent check of roughly 20 percent of the deficiencies identified in Appendix C and noted that these deficiencies had been incorporated into the licensee's EOPs.

b. (CLOSED) EOP inspection finding 316/88017-02: The EOP team identified numerous recommendations to the licensee's EOPs in Appendix B of the report. The Appendix B contained some 20 pages of technical and writer's guide comments, observations and suggestions for EOP improvements made by the EOP inspection team. Although the majority of the comments were not regulatory requirements, the licensee agreed to evaluate the comments and take appropriate corrective action.

The inspector's review of the licensee's response and discussion with the operations staff found that a majority of the technical and human factor discrepancies outlined in Appendix B of the inspection report were corrected. Those discrepancies which were not adopted for incorporation as recommended by the EOP inspection were documented in Attachment B of the "NRC EOP Audit Close Out Report." The inspector's review of Attachment B of the licensee's "NRC EOP Audit Close Out Report" found that the licensee's justification for not incorporating these discrepancies appeared to be reasonable. Additionally, the inspector performed an audit of approximately 10 percent of the procedures identified in Appendix B of the EOP report and found that these recommendations had been incorporated into the licensee's EOPs.

c. (CLOSED) EOP inspection finding 316/88017-03: The EOP inspection team identified two procedures which were determined to be inadequate. "Reactor Shutdown from Hot Standby Panel due to Control Room Inaccessibility" procedure, 2-OHP-4023.001.011, Rev. 2, contained insufficient direction in that the majority of the procedure appeared to be an inventory of the instrumentation and controls available to the operator at the hot standby panel. Little guidance was provided on the control of the unit following a reactor trip when evacuation of the control room is required. Additionally, although discussions with the licensee indicated that this procedure was to be implemented in conjunction with existing plant procedures, no reference was made to the existing normal, abnormal or emergency procedures within the hot standby procedure.

The second inadequate procedure, "Loss of Control Air," 2-OHP-4023.001.006, Rev. 1 did not identify the instrumentation that would be inoperative following a loss of control air.

The inspector performed a limited review of procedure "Emergency Remote Shutdown", 2-OHP-4023.001.011, Rev. 3, Oct. 10. 1989. The procedure appeared to be adequate and provided adequate guidance on steps required to place the Unit in a hot standby condition from the hot standby panel in the event the evacuation of the control room became necessary.

The inspector also performed a limited review of procedure "Loss of Control Air," 2-OHP-4023.001.006, Rev. 2, Apr. 17, 1989, and found that it listed the expected responses of various instruments/valves to a complete loss of control air, as well as the expected response of essential valves in the plant due to a complete loss of control air.

d. (CLOSED) EOP inspection finding 316/88017-04: The EOP inspection team found out-of-date Attachments "A" and "B" used in ECA-0.0, "Loss of All AC Power" and FR-Z.1, "Response to High Containment Pressure." The Attachments are used to verify that the applicable valves close on either Phase "A" or Phase "B" containment isolation signals. They were apparently not revised when Attachments "A" and "B" of E-0, "Reactor Trip or Safety Injection", procedure were revised to correct several errors in the listing of valves. Because Attachments "A" and "B" to ECA-0.0 and FR-Z.1 were not revised at the time that procedure E-0 was revised, these two attachments contained both missing and erroneous information. Additionally, Phase "A" isolation valve 2-GCR-314 was not labeled on the safety injection/accumulator panel as a Phase "A" isolation valve nor was it included on Attachment "A", Rev. 0 or 1.

The inspector reviewed Attachments "A" and "B" to ECA-0.0 and FR-Z.1 and found that these attachments now contain the current listing of the valves under the proper attachments. However, the inspector noted a minor discrepancy with the valve description of 2-ECR-32 which was identified as "LWR CNTMT air SMPL to RMS/PASS" in Attachment B of procedure E-0, ECA-0.0 and FR-Z.1. The valve description should read "LWR CNTMT air SMPL to ERS-2300." The licensee issued a request to correct this deficiency.

Additionally, the inspector noted through direct observation in the control room that valve 2-GCR-314 is now labeled as a Phase "A" isolation valve and it is included as a Phase "A" isolation valve in Attachment "A" to procedure E-0, ECA 0.0 and FR-Z.1.

e. (CLOSED) EOP inspection finding 316/88017-05: The EOP inspection team was concerned with the controls for review and revision of the EOPs which existed at the time of the inspection. The EOP team found that prior to final approval and implementation of the EOPs, neither QA nor other management control groups performed an adequate detailed technical review. Consequently, the EOP team recommended that the licensee:

(1) Conduct walkthroughs of the procedure in the control room and in the plant.

(2) Conduct a verification of technical specification requirements.

(3) Conduct a evaluation of the review and revision process as it applies to EOPs.

The inspector was informed by the Operations department staff that 100 percent walkdown on the EOPS was completed in about June of 1989 for both Units and all discrepancies identified were corrected. Also, the inspector was informed that they had conducted verification of Technical Specifications requirements utilizing two different individuals for the purpose of performing an independent check to ensure containment isolation valves have been included in the procedures. Additionally, the licensee has issued procedure "Emergency Operating Procedure (EOP) Maintenance," Rev. 0, March 31, 1989, which details the administrative requirements with respect to detailed verification/validation procedure, processing and prioritization comments.

f. (OPEN) EOP inspection finding 316/88017-06: EOP inspection team identified a large number of EOP procedure comments (well over a hundred items of various kinds) had been accumulated for which the final action had not been taken. The EOP team viewed the failure to make timely and thorough revisions to EOPs concerning certain known deficiencies to be a significant weakness.

The inspector's review found that currently there are about 40 EOP comments which require resolution. These comments were found to be prioritized into three categories: "Priority Level One (1) - Immediate Action", "Priority Level Two (2) - Expedited Action", and "Priority Level Three (3) - Procedure revision". Comments which were classified as requiring "Immediate Action" were incorporated within one work week; those classified as "Expedited Action" were corrected within one month; and those classified as "Procedure revision" were incorporated during the next scheduled revision. The inspector found one priority 2 comment from May 1989 with no response due date. The licensee indicated the item would be re-evaluated for a possible higher priority, and that a response from the licensee's corporate office was requested. Until the comment is resolved this item will remain open.

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

7. <u>Safety Assessment/Quality Verification (37701, 38702, 40704, 92720)</u>

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, Radiological Deficiency 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.

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

8. <u>Region III Requests (92705)</u>

The inspector acted upon a March 8, 1991 memorandum from Mr. Hubert J. Miller, Director, Division of Reactor Projects (DRP), to NRC Region III Branch Chiefs regarding hydrogen recombiners. The memorandum requested information on hydrogen recombiners installed in Region III plants because of parts dedication concerns that were identified at another U.S. utility. Attached to the memorandum was a questionnaire which was completed and forwarded to the Region III Technical Support Staff for compilation and evaluation. The emphasis was on recombiners stored remotely from the plant site, which would be connected external to the containment at need. The D. C. Cook plant has its hydrogen recombiners permanently installed inside each containment.

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

9. Management Meeting (30702)

a. A management meeting, attended as indicated in paragraph 1.a, was conducted at the D.C. Cook site on April 2, 1991. The purpose of the meeting was to discuss various topics of interest, and to tour the plant.

The meeting began with a discussion related to the 10CFR50 Appendix R NRC inspection, including pre-1984 candor issues, as were described in various submittals by the licensee to NRC. The Regional Administrator was satisfied with the resolution of the candor issues and that subject is considered closed (EA-82-139).

Among the other topics presented by the licensee staff were:

(1) Engineering/Technical Support organization and function as related to Corporate, System Engineering, and Site Design Perspectives

(2) Maintenance Program status

b. A management meeting, attended as indicated in paragraph 1.b, was conducted at the D.C. Cook site on April 17, 1991. The purpose of the meeting was to discuss licensee performance and initiatives, and to tour the plant.

Among the topics presented by the licensee staff were:

(1) Current Unit 1 and Unit 2 status.

(2) Licensee performance indicators for years 1988, 1989, 1990, and the following subjects:

Equipment availability
Unplanned auto scrams
Fuel reliability

(3) Licensee Strengths:

People
Security
Emergency Preparedness

(4) Licensee Challenges:

Eng/Tech Support
Maintenance

10. Management Interview (30702)

The inspectors met with licensee representatives (denoted in Paragraph 1) on May 3, 1991 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.