

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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License Nos: DPR-58, DPR-74

Report No: 50-315/96005; 50-316/96005

Licensee: Indiana Michigan Power Company

Facility: Donald C. Cook Nuclear Generating Plant

Location: One Cook Place
Bridgman, MI 49106

Dates: April 9 - May 25, 1996

Inspectors: B. L. Bartlett, Senior Resident Inspector
D. J. Hartland, Resident Inspector
C. N. Orsini, Resident Inspector
M. Holmberg, Regional Inspector
S. D. Burgess, Regional Inspector
J. L. Belanger, Senior Physical Security
Inspector

Approved by: T. J. Polich, Acting Chief
Reactor Projects Branch 3

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Executive Summary

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/96005, 50-316/96005

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection; in addition, it includes the results of announced inspections of the motor-operated valve, inservice inspection, and access authorization programs by region-based inspectors.

Operations

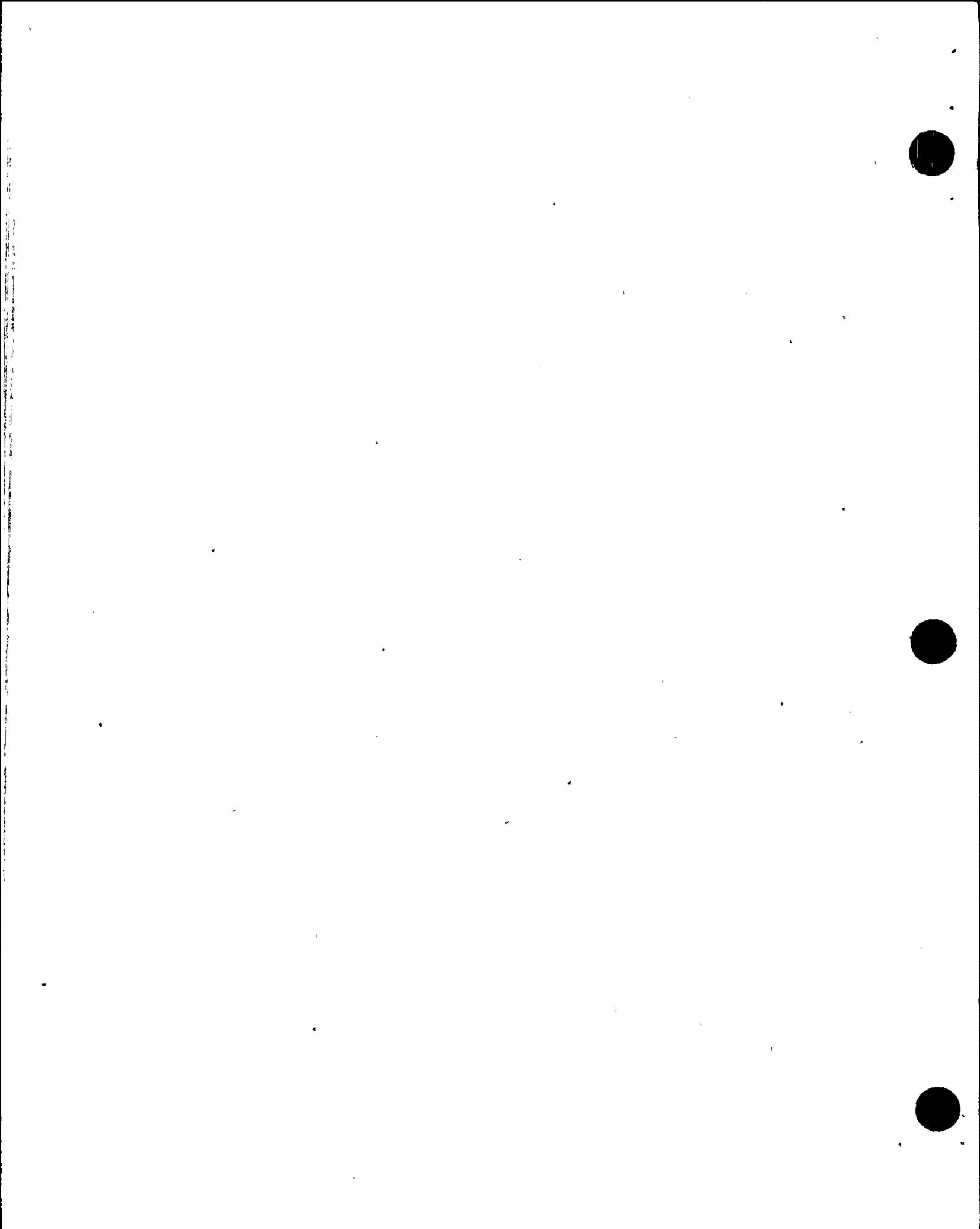
- The inspectors determined that licensee management provided strong guidance and support in the identification of an adverse trend in operator performance. The inspectors noted that the licensee's investigation was self-critical and helped identify a significant adverse trend in a timely manner. In addition, management also ensured that sufficient time and resources were available for the shift to correct any deficiencies, before returning to duty. Several operator errors are described in Sections 03.1, 04.1, and 04.2. The failure of the control room operators to follow procedures and maintain a minimum flow valve open was a non-cited violation. Although each instance by itself was not significant, combined they were indicative of a negative trend in operator attention to detail and/or self-checking. Additionally, as described in Section 04.3, the failure to maintain control room staffing as required by Technical Specifications, was a non-cited violation.
- The licensee expended significant resources in performing a thorough preparation for an important outage evolution that among other things involved a deliberate entry into a notification of unusual event (NOUE). However the licensee made no effort to increase the priority of a change request to the emergency classification criteria that had been submitted to the NRC in order to avoid entering the NOUE (Section 01.2).

Maintenance

- The licensee's inspection of the Unit 2 recirculation sump was thorough, with prompt correction of the deficiencies that were identified (Section M4.1).

Engineering

- The lack of licensee or Authorized Nuclear Inservice Inspector (ANII) reviews of the qualification training document for South West Research Institute (SWRI) Non-Destructive Examination (NDE) personnel and the lack of documentation for ANII reviews of NDE procedures, indicated that while regulatory requirements were generally being met, opportunities existed for improvement in the oversight of the inservice inspection (ISI) program (Section E1.3).



- The failure to use the proper gain settings for ultrasonic equipment during automated ultrasonic examinations of the reactor vessel nozzles resulted in the issuance of a non-cited violation. The attempted use of an unapproved dye penetrant testing (PT) developer fortuitously did not result in a violation of regulations and indicated that the NDE personnel could give additional attention to NDE consumables (Section E4.1).
- Since the inspection in 1995, significant program progress had been made with retesting Motor Operated Valves (MOV) using the VOTES diagnostic system. Strengths included the number of MOV dynamic tests performed and diagnostic system improvements. However, the inspectors noted weaknesses in the justification for valve thrust requirement predictions and stem friction coefficient/rate of loading assumptions for valves not dynamically tested (Section E2.1).

Plant Support

- An inspection of the licensee's access authorization program identified several program strengths and no significant concerns (Section S1.1).



Report Details

Summary of Plant Status

Unit 1 began this inspection period at 100 percent power. On April 23, the unit was reduced to approximately 55 percent power due to condenser waterbox high differential pressure. A large school of fish (Alewife) were at the intake and sufficient carryover was occurring such that condenser tubes were being blocked. The licensee cleaned the waterboxes and power was restored to 100 percent. The unit remained at full power for the remainder of the inspection period.

Unit 2 started this inspection period in a refueling outage. Major work activities included 10 year inservice inspections, refueling, replacement of an essential service water pump, refurbishment of a low pressure turbine, and scheduled swap out of a reactor coolant pump motor. On May 7, the licensee initially entered mode 2 (reactor critical). On May 8 the licensee was performing overspeed testing of the main turbine generator when an unplanned turbine trip/reactor trip occurred. The licensee returned the unit to power and on May 9 synchronized the generator to the grid. On May 10, at about 35% power the licensee identified a small oil leak on the A phase main transformer and reduced power to take the generator off-line and repair the leak. The Unit was returned to the grid on May 11. The unit slowly increased power in accordance with the post-refueling startup plan. On May 18 the unit experienced a moisture separator reheater isolation which combined with minor equipment malfunctions and operator errors led to a power decrease to 85% power. The unit was returned to full power on May 19.

I. Operations

01 Conduct of Operations

01.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below. In particular, the inspectors were concerned with some operator performance problems that were observed. However, these problems appeared to be limited to one shift, and operations management took prompt, aggressive action to address the concerns.

01.2 Pre-Planned Entry Into A Notification Of Unusual Event (Unit 2)

a. Inspection Scope (93702)

On Sunday, April 14, the licensee made a pre-planned entry into a notification of unusual event (NOUE). The cause of the NOUE was both Unit 2 diesel generators (D/Gs) being inoperable or unavailable while the unit was defueled. The inspectors responded to the facility and



observed the licensee's entry into the NOUE and the use of the following procedures:

- D. C. Cook Plant Managers Procedure PMP 2080 EPP.101, "Emergency Classification."
- PMP 4100, "Plant Shutdown Safety and Risk Management."

b. Observations and Findings

The licensee had originally scheduled the performance of maintenance on the two safety related diesel generators (D/G) at separate times. Due to continuing problems with the restoration of the 2CD diesel, the licensee made the decision to remove the other train of D/G (AB) from service and work on both D/Gs simultaneously in order to stay on schedule. As required by PMP 2080, the licensee entered a NOUE when the second D/G was removed from service.

The licensee had planned to perform a dual train essential service water (ESW) and dual train component cooling water (CCW) outage during the Unit 2 refueling outage. The licensee had recognized that the dual train ESW/CCW outage would require intentional entry into an unusual event due to the D/Gs being inoperable and unavailable and had performed extensive assessments and preparations. These preparations involved coordination meetings, procedural reviews, procedural changes, engineering calculations and training. Subsequently, due to changes in plant conditions, the dual train ESW/CCW outage was not required.

Due to the schedule impact upon the Unit 2 outage, on April 14, the licensee decided to utilize the safety reviews performed for the dual train ESW/CCW outage to perform a dual train D/G outage. After the on-site safety review committee had approved the plan to have both D/Gs inoperable and unavailable simultaneously, the licensee gave a courtesy call to the resident inspectors. One hour after the safety committee meeting had occurred and the NRC was notified, the licensee entered the unusual event.

The NRC determined:

- The licensee had made no effort to pursue a prompt revision of the emergency classification criteria in an effort to avoid the NOUE. Unrelated to this event the licensee had previously submitted a request to the NRC to change the criteria, but this change was not yet final. The licensee made no effort to have the NRC increase the priority of their change request.
- Licensee management personnel informed the NRC that licensee emergency operating procedures required the operators to check the temperature of the spent fuel pool during accidents. The NRC



determined that no such requirement existed. In the licensee's procedure for the loss of all alternating current, there was a requirement to have the operators check the spent fuel pool level.

- The licensee had not evaluated the weather forecast in an effort to ensure the stability of the off-site electrical system. Subsequently, there were four thunderstorms during the seven days that both unit 2 D/Gs were unavailable.

c. Conclusions

The inspectors determined that this evolution had minimal safety consequence given the plant conditions. The licensee made effective use of the extensive preparations for the dual train ESW/CCW outage. However, the need for the licensee to intentionally enter a NOUE for seven days was not demonstrated.

01.3 Startup Observations (Unit 2) (71707)

The inspectors observed startup activities in the Unit 2 control room on May 7, 8, and 9. There was effective command and control by shift management, clear communications by the personnel involved, and good support by plant engineering personnel. Complex activities were temporarily suspended during shift turnover and the new crews effectively briefed on the work evolutions. The NRC determined that overall, the startup was performed appropriately.

03 Operations Procedures and Documentation

03.1 Reactor Trip During Main Turbine Overspeed Testing (Unit 2)

a. Inspection Scope (93702)

At 11:44 a.m. on May 8, 1996, with Unit 2 operating at 7 percent of rated power, the reactor unexpectedly tripped during main turbine overspeed (MTO) testing. The inspectors responded to the control room and observed the operators' response to this event, including operator monitoring of annunciators and parameter trends and stabilization of the plant in the hot standby condition.

The inspectors also reviewed the licensee's evaluation of the cause for the trip and the procedure being used to perform the turbine testing, 02-OHP 4030.STP.101, "Main Turbine Overspeed Test," Revision 4.

b. Observations and Findings

The reactor protection system (RPS) was designed such that, when a turbine trip occurred and power was greater than 10 percent, a reactor trip would result. Power level was sensed by four neutron detectors outside the reactor vessel and two steam pressure sensors on the high pressure turbine. MTO testing was conducted with power less than ten



percent so that the turbine trip signal would not result in a reactor trip.

While preparing to perform the MTO test, the operating crew questioned the manner in which the turbine speed should be increased to reach the trip setpoint. Step 8.4.9, of procedure 02-OHP-4030.STP.101 stated, "Pull the operating device to the "Pull to Overspeed" position. The turbine will increase speed to the 112% trip..." After further discussions, the crew could not identify any further guidance, and proceeded with the step as written.

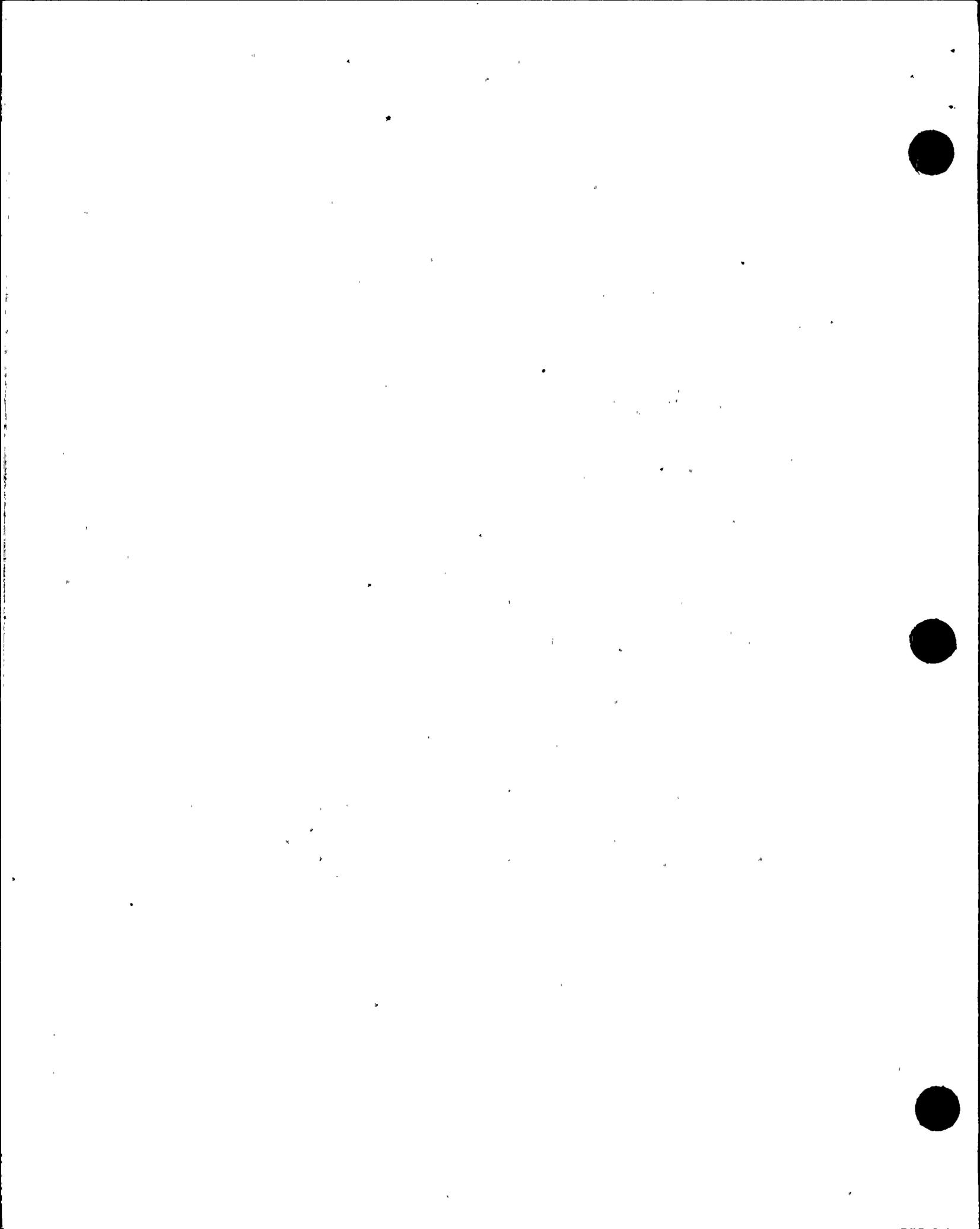
When the operator performed step 8.4.9, turbine speed increased rapidly. The turbine tripped within the acceptable designed range of speed, but a reactor trip also occurred. The licensee's review of this evolution determined that because of the rapid rate of increase of turbine speed, one steam pressure instrument momentarily sensed a steam pressure corresponding to a power level greater than 10 percent. Combined with the turbine trip signal, this resulted in a reactor trip. The licensee also determined that step 8.4.9 was normally performed in an incremental fashion, so that turbine speed was slowly increased to the trip setpoint.

The plant responded as expected, with a few minor exceptions. Steam dump valve URV-130 showed intermediate indication when it should have been full closed, and 3 of 4 auxiliary feedwater (AFW) discharge valves throttled to their "flow retention" position. The fourth valve (FMO-222) remained full open, and the operator was unable to throttle the valve for approximately 2 minutes. The resulting high flow to one steam generator combined with the low decay heat from a new core, resulted in RCS temperature decreasing to approximately 4° below the no load temperature.

During the post-trip review, the licensee determined that FMO-222 had performed as designed, but the other 3 valves had received spurious "flow retention" signals due to a pressure pulse following the AFW pumps auto-start. The operators were accustomed to these valves receiving a flow retention signal following most trips, even though the signal was only designed to protect the pump when high flow conditions could lead to the pumps operating at runout. The licensee and the inspectors will further review the design and operation of the AFW system with specific attention to the "flow retention" and related "flow conservation" signals. This issue will be considered an inspection followup item pending review of the licensee's evaluation (50-315/316/96005-01(DRP)).

Also, the inspectors noted that the following factors combined to contribute to the improper performance of MTO testing:

- This test was an infrequent evolution (performed once an operating cycle).



- This was the first time the individuals operating the controls had performed MTO testing.
- No refresher training was provided prior to the evolution.

c. Conclusions

The inspectors determined that although the operating crew exhibited a questioning attitude regarding the performance of the MTO testing, they did not ensure that the concerns were satisfactorily resolved prior to proceeding.

The procedure provided insufficient guidance to properly perform the evolution given the non-routine nature of the test. However, as the procedure was not covered by NRC requirements, no violation occurred.

04 Operator Knowledge and Performance

04.1 Centrifugal Charging Pump (CCP) Operated With No Flowpath Available (Unit 1)

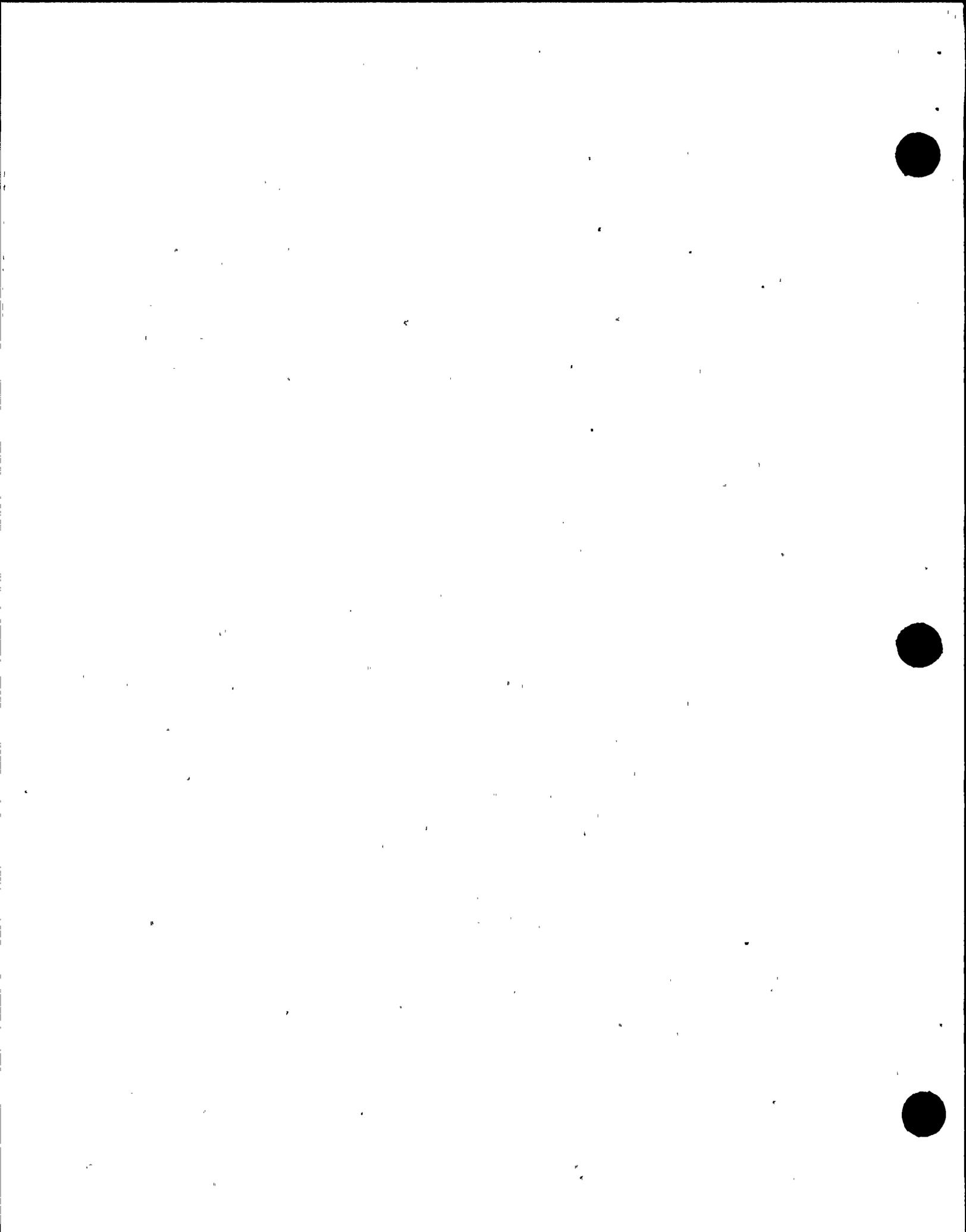
a. Inspection Scope (71707)

On May 8, 1996, the Unit 1 West CCP was taken out of service to perform maintenance on a recirculation line drain valve, and to perform routine lubrication of QMO-226, the recirculation path isolation valve. While performing surveillance procedure 01-OHP-4030.STP.052W, "West Centrifugal Charging Pump Operability Test," Revision 3, prior to returning the W CCP to service, the pump was run for approximately three minutes without a discharge flowpath. The inspectors reviewed the surveillance procedure, the operator's actions, and the licensee's basis for determining that the pump remained operable following the evolution.

b. Observations and Findings

Step 8.6 of STP.052W stated "verify the following valves are OPEN: ... West CCP recirc. valve QMO-226 OPEN." The operator performing this evolution stated that he checked the indication for QMO-226 on the control room panel, and believing it was open, signed the step as complete. The pump was subsequently started with no discharge flowpath. Approximately 3 minutes later, the Unit Supervisor noted that QMO-226 was closed, and had the operator open the valve.

The remainder of STP.052W was then performed which included verifying sufficient flow and discharge pressure were attained, and the vibration levels remained at acceptable levels. Based on the successful completion of the surveillance and following discussions with the system engineer, the licensee determined that the pump was not damaged and declared it operable. The licensee has also placed this pump on an increased monitoring program to ensure that possible long-term affects are identified.



c. Conclusions

This event was an instance where an operator failed to follow a procedure. However, following two other events which involved personnel errors by the same operating shift, the licensee took prompt aggressive corrective actions to address this failure (as described in Section 4.4). Therefore, this licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-315/96005-02(DRP)).

04.2 Personnel Errors during Feedwater Heater Level Testing (Unit 2)

a. Inspection Scope (71707)

On May 18, 1996, Unit 2 experienced a transient during feedwater heater level alarm testing. The transient was complicated by several inappropriate operator actions and an equipment malfunction, resulting in four trips of the South heater drain pump (HDP) and a power reduction to 85 percent. The licensee conducted an in-depth investigation of this event. The inspectors reviewed the results of the investigation and the licensee's implementation of corrective actions.

b. Observations and Findings

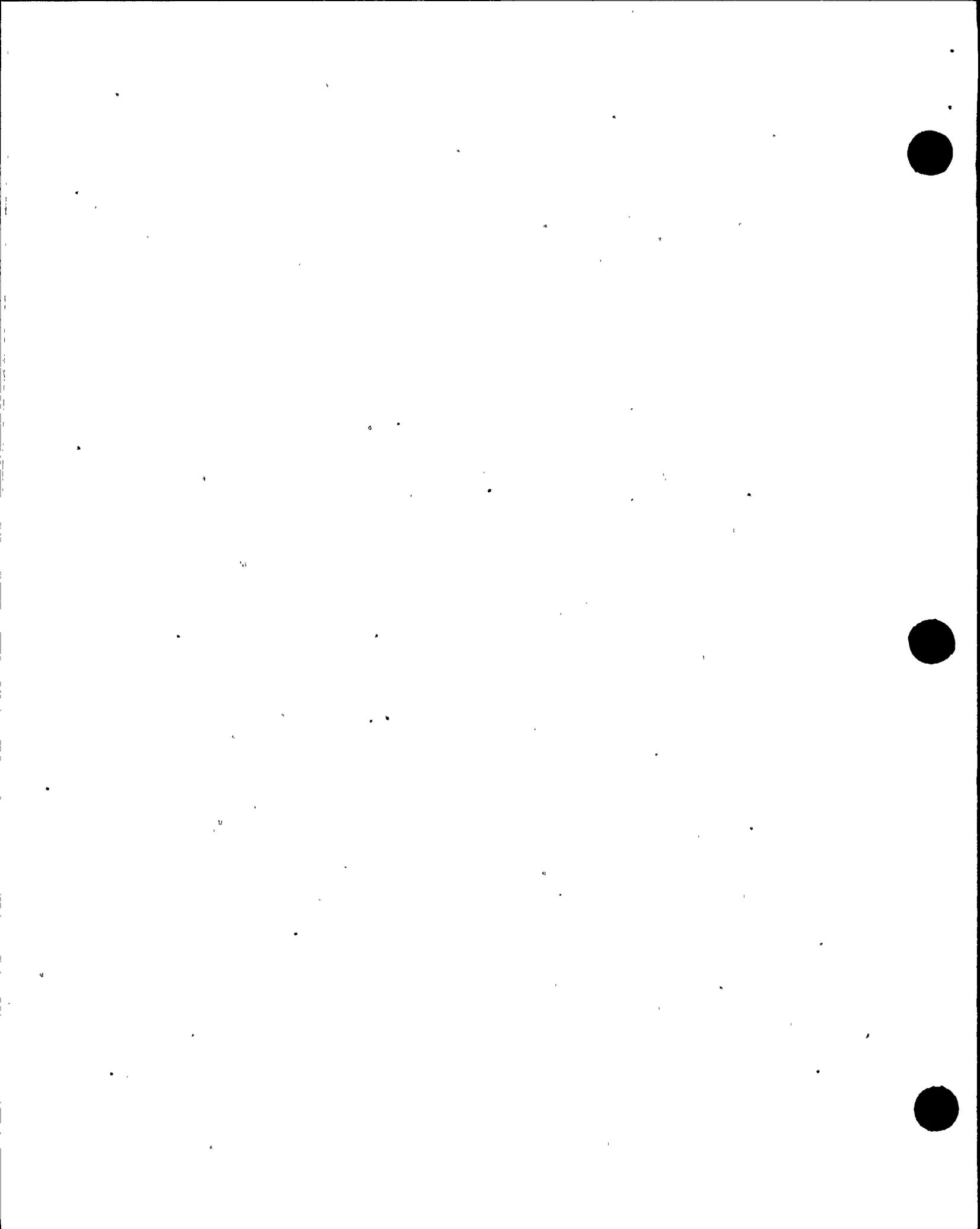
The 6A heater has two level alarms and one level switch. The hi and extreme hi alarms annunciate in the control room. The level switch actuates at the same level as the extreme hi alarm and sends a control signal to three valves:

- CLOSE HMO-630 Reheater coil drain tank to heater 6A
- CLOSE HMO-605 Bleed steam to HP heater 6A
- OPEN HMO-629 Reheater coil drain cross-tie

These valve actuations were designed to isolate the incoming flow to the 6A heater (HMO-630 and 605) and provide an alternate drain path for the reheater coils (HMO-629).

Procedure 02-OHP-4021.060.012, "Heater Level Alarm Operability Test," Revision 4, is accomplished by raising level in the alarm column to simulate hi level conditions without affecting actual heater level. The two alarms are verified to actuate, and valve movement of HMO-630 and 605 are verified. HMO-629 is prevented from actuating by removing the control power fuses. To prevent valve closures from producing a transient, the operator is directed to take manual control of HMO-630 and 605 to prevent the valves from going closed.

On May 18, 1996, the licensee performed the procedure. When level was raised in the alarm column the hi alarm actuated as expected. The operator was then waiting for the extreme hi alarm when he noted that HMO-605 had begun to close. He immediately took control of the valve to



prevent it from closing. However the operator did not check the status of HMO-630 which also had begun to close. The closure of both valves should have been anticipated by the operator.

As HMO-630 closed, level began to increase in the North reheater coil drain tank. This resulted in an isolation of the North moisture separator reheater (MSR) bundles which produced a mild transient causing the South MSR to also isolate. These MSR isolations reduced flow to the A and B string of heaters and the South heater drain pump (HDP) tripped on low level in the 4B heater. Level was restored in the 4B heater and the pump was restarted.

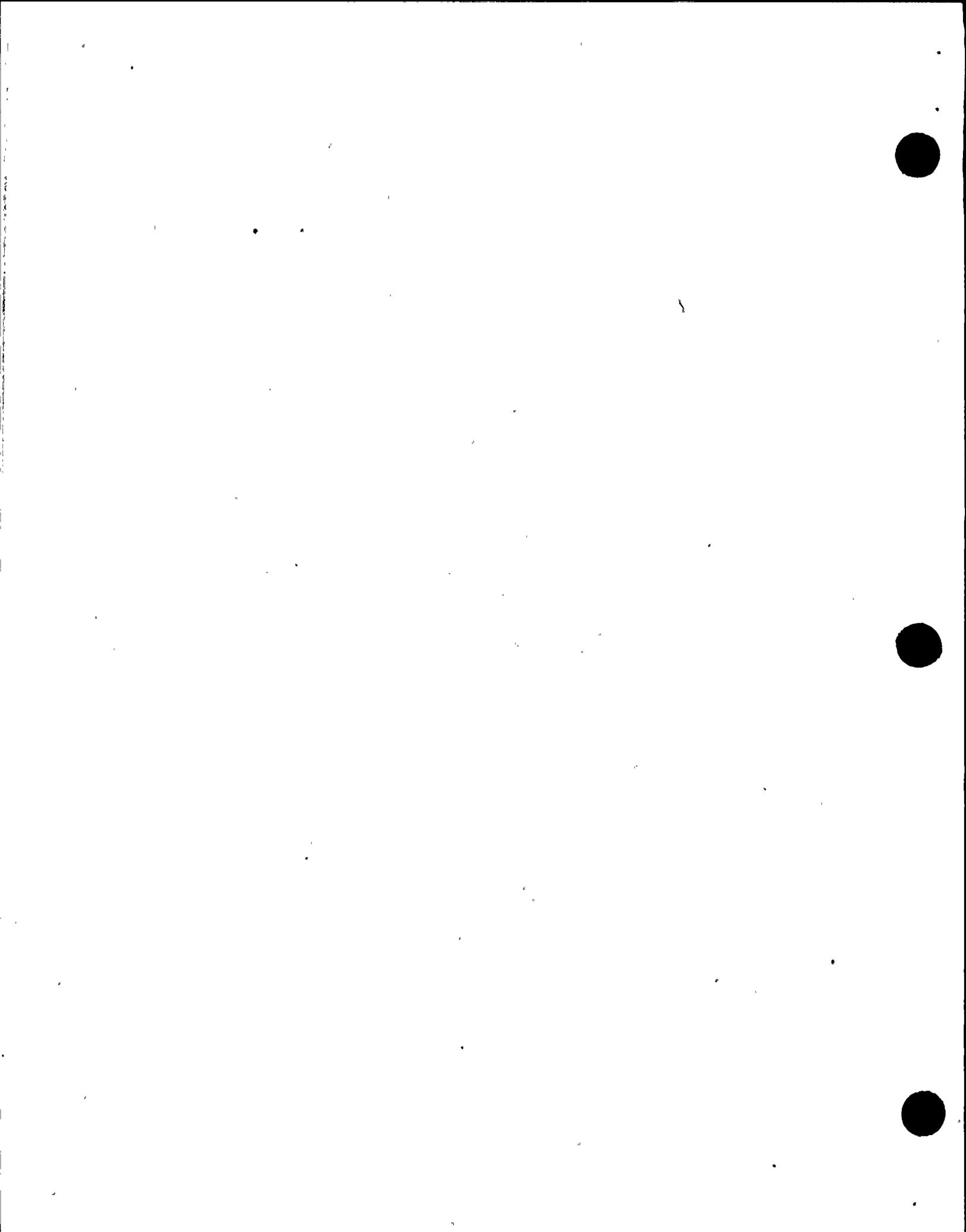
The licensee's efforts to recover from this minor secondary transient were complicated by several factors which resulted in a power reduction to 85 percent before the primary and secondary portions of the unit were stabilized.

The licensee's investigation determined that this event involved two equipment malfunctions and several operator/crew performance issues. The equipment malfunctions were as follows:

- The extreme hi level alarm failed to annunciate in the control room. The licensee had not determined the cause for this failure, but planned to review the testing methodology and enter an action request for repair of the switch, if necessary. This failure did not contribute to the subsequent transient.
- The boric acid flow transmitter power supply failed. This failure apparently occurred prior to this event without any obvious signs to alert the operator. The failure complicated the recovery from the MSR isolation because the reactor operator attempted to add boric acid but observed no indication of flow. This resulted in the operator adding additional boric acid and an excess of boric acid being injected. Excessive boration necessitated a reduction of power to 85 percent.

The operator/crew performance issues were as follows:

- The operator performing the surveillance did not recognize that both valves were closing. HMO-630 was allowed to completely close, which isolated the only drain path from the North MSR. This resulted in the bundle isolation and started the secondary transient and the first HDP trip.
- When the shift supervisor (SS) and assistant SS responded to the control room, they became too narrowly focused on efforts to restore the feedwater heater strings instead of evaluating the plant as a whole. This narrow focus, along with an unnecessary sense of urgency, contributed to the SS giving inappropriate direction to an operator to open MSR drains. This resulted in a second HDP trip.



- Auxiliary operators were instructed to restore from the surveillance, but were not given any further direction. Their subsequent actions, while in accordance with procedural requirements, resulted in a third HDP pump trip.
- The South HDP tripped a fourth time because the existing system line-up could not provide sufficient water to the pump suction.

The licensee's investigation also identified an adverse trend with the performance of the operating crew involved. Common factors involved with this and previous events were inadequate communications and teamwork. Operations management had the shift supervision initiate a self-assessment to determine possible causes and proposed remedies to the problems. However, before any results could be achieved, the shift was involved with the event described in Section 4.3, and more aggressive corrective actions were taken (Section 4.4).

c. Conclusions

Several operator and crew performance problems contributed to the transient. Communications within and from the control room resulted in taking inappropriate actions or failing to take actions that resulted in additional trips of the HDP. Additionally, equipment malfunctions, without any obvious signs to alert the operators, complicated the recovery from the MSR isolation. The inspectors noted that the licensee's prompt investigation of this matter was self-critical and helped identify the significant adverse trend in personnel performance.

04.3 Inadequate Control Room Staffing

On May 23, 1996, the Unit 2 Unit Supervisor received relief from an extra Senior Reactor Operator (SRO). The extra SRO had been overseeing screenhouse activities. Shortly after taking the watch, the extra SRO was paged and his assistance was requested in the screenhouse. He then left the control room, failing to realize that the control room was left with no SRO. Approximately 90 seconds elapsed with the Unit 2 control room having no SRO present.

When the operations superintendent was notified of this event, based on several previous events involving this crew, the crew was reassigned to a training status following the completion of the day's shift.

Technical Specification 6.2.2 states in part that while the unit is in Mode 1, 2, 3, or 4, at least one licensed Senior Operator shall be in the control room. The licensee took aggressive corrective actions that went beyond the factors leading to this event (as described in Section 4.4). Therefore, this licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-316/96005-03(DRP)).



04.4 Conclusions on Operator Knowledge and Performance

The inspectors were concerned with the operator errors described in Sections 03.1, 04.1, and 04.2. Although each instance by itself was not significant, combined they were indicative of a negative trend in operator attention to detail and/or self-checking. Additionally, the Unit 2 control room had no SRO present. This reflects a lack of attention of the SRO to his command and control responsibility in the control room.

Licensee management was also concerned with the adverse trend and determined that the errors were limited to a single operating crew. Management had begun to address performance concerns within the shift prior to the event described in section 04.3, and subsequently took further action. Licensee management believed that shift teamwork and communications were insufficient to accomplish tasks at an acceptable level. Therefore, the shift was relieved of operating responsibility and given an opportunity to identify, correct, and practice the needed skills in a training environment. There was no concern identified pertaining to individual operator knowledge or performance.

The inspectors determined that licensee management provided strong support in the identification of the adverse trend in operator performance. Management also ensured that sufficient time and resources were available for the shift to correct any deficiencies before returning to duty.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703 and 61726)

The inspectors observed all or portions of the following work activities:

- 2-OHP 4021.001.006 Power Escalation
- 2-EHP 6040 PER.359 Zero Power and Power Ascension Tests for Post-Refueling Startups
- 2-EHP 6040 PER.357 Initial Criticality All Rods Out Boron Concentration and Nuclear Heating
- 2-EHP 6040 PER.350 Isothermal Temperature Coefficient Measurement and Moderator Temperature Coefficient Calculation
- 2-MHP 4030 STP.008 Inspection of Containment Sumps

c. Conclusions

The inspectors determined that the work activities observed were performed in a professional and deliberate manner. Procedures appeared to be adequately written and followed, workers appeared to be knowledgeable and questioned data when appropriate.

M4 Maintenance Staff Knowledge and Performance

M4.1 Licensee's Inspection of the Recirculation Sump (Unit 2)

a. Inspection Scope (62703)

In inspection report 50-315/316-95012, the NRC documented licensee weaknesses in the inspection of the containment recirculation sump. The purpose of this inspection was to verify the licensee performed a complete inspection of the sump in order to identify and remove all extraneous items.

b. Observations and Findings

The NRC determined that the licensee appropriately identified and corrected the following deficiencies in the recirculation sump:

- Peeling and chipping paint on the sump walls and floor.
- Dirt on the sump floor.
- Gaps around the fine mesh screen in excess of 1/4".

The NRC reviewed the licensee's reportability and operability assessments of the identified findings and had no concerns.

During an inspection of the sump, the NRC identified 5 holes drilled through the roof of the containment recirculation sump. These holes were about 3/4" in diameter and did not have fine mesh screens installed. The licensee filled the holes and determined they were not an operability problem. The inspectors reviewed the operability assessment and had no concerns.

The licensee inspection findings for Unit 2 were similar to the items found by the NRC in the previous verification inspection of the Unit 1 recirculation sump (items identified by NRC in Unit 1 had not been identified by the licensee). The licensee's inspection of the Unit 2 recirculation sump during this refueling outage was much more thorough than the inspection of the Unit 1 sump. The removal of the minor debris identified in the sump, while not required, was appropriate.



c. Conclusions

The licensee's procedure for performing the inspection had not been altered since the Unit 1 inspection. Inspection performance had been improved by raising the workers expectations and their supervisors' expectations.

M8 Miscellaneous Maintenance Issues

- M8.1 (Closed) Violation 50-315/316-95012-01(DRP): failure to comply with procedural requirements for removal of debris in containment. The inspectors identified trash and debris in Unit 1 upper containment following the licensee's closeout tour during the previous refueling outage. The inspectors had also raised this concern during previous outages. As corrective action, the licensee implemented a new FME program to institute a front end approach versus the inspection/retrieval method previously employed. In addition, licensee management and RP personnel conducted routine tours of containment during the recent Unit 2 refueling outage to ensure that the new standards for cleanliness were being met. The inspectors toured Unit 2 following the licensee's closeout tour and did not discover any foreign material. The inspectors concluded that licensee performance with regards to containment cleanliness during the Unit 2 outage was very good.

III. Engineering

E1 Conduct of Engineering

E1.2 Inservice Inspection (ISI) - Review of Program

a. Inspection Scope (73051)

Inspectors reviewed the inservice inspection program and its implementation, for compliance with technical specifications, ASME Code and NRC requirements.

b. Observations and Findings

The inservice inspection program complied with ASME Section XI 1983 Edition, Summer Addenda requirements.

c. Conclusion

No violations or deviations were identified.

E1.3 Inservice Inspection - Procedure Review

a. Inspection Scope (73052)

NRC inspectors reviewed procedures used during observed ISI activities for compliance with ASME Code and NRC requirements.



b. Observations and Findings

No documentation existed on-site to verify ANII reviews of NDE procedures had been performed. The ANII reported that all "log book" records documenting NDE procedure reviews had been taken by the licensee's former insurer Factory Mutual, after the licensee switched insurance carriers. NRC questions prompted the licensee to request the ANII to review Southwest Research Institute (SWRI) NDE procedures for ASME Code compliance and provide the licensee documentation of this review.

c. Conclusions

The lack of documentation for ANII reviews of NDE procedures indicated that opportunities existed for improvement in the oversight of the ISI program. No violations or deviations were identified.

E2 Engineering Support of Facilities and Equipment

E2.1 Generic Letter 89-10 Program Review

a. Inspection Scope (TI 2515/109)

The inspectors reviewed procedures, calculations, and motor-operated valve (MOV) evaluations to determine the adequacy of the MOV program established in response to Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance."

b. Observations and Findings

Inspector observations regarding the capability of the power operated relief valve (PORV) block valves and the effect of low voltage on motor brake performance are discussed below.

Low Valve Factor for PORV Block Valve

An unusually low valve factor (VF) of 0.30 was used for six PORV block valves. The inspectors considered a VF of 0.40 to be more consistent with other industry testing. The licensee performed a calculation which showed valve margin with a VF of 0.40; however, valve 1-NMO-152 had minimal margin. As a result, the licensee added this valve to the forced outage list for an opportunity to further evaluate the valve prior to final disposition via design change. The inspectors evaluated the licensee's operability justification for valve 1-NMO-152 and found it acceptable. No further concerns were noted.

MOVs With Motor Brakes

The licensee did not evaluate the capability of MOVs equipped with motor brakes at the second-level undervoltage relay setpoint. As discussed in Information Notice (IN) 93-98, "Motor Brakes on Valve Actuator Motors," and Limitorque Maintenance Update 92-2, MOVs with motor brakes installed

might receive insufficient voltage to allow the motor brakes to be released under degraded voltage conditions. The licensee's initial IN 93-98 evaluation used degraded voltages based on a 5-year grid study that the NRC determined to be unacceptable for capability evaluations for GL 89-10 MOVs as discussed in NRC inspection report 50-315/316/94018. The inspectors prompted a licensee re-evaluation using the second-level undervoltage relay setpoint, which determined that the RCS pump seal water return train A containment isolation valve, 2-QCM-250, did not have adequate actuator output torque capability to trip the torque switch considering degraded voltage, temperature effects, and motor brake torque loss. Since Unit 2 was in an outage, the licensee removed the brake from 2-QCM-250 prior to unit restart.

The licensee considered the MOV to be operable with the brake, based on using the 5-year grid study. The inspectors disagreed with this approach and requested that the Office of NRR review the acceptability of use of the 5-year study of worst case grid voltages for GL 91-18 operability evaluations in lieu of the more conservative second level undervoltage relay setpoint (plus tolerances). This issue will be considered an inspector follow-up item until resolved by NRR (50-315;316/96005-04(DRS)).

c. Conclusions

The inspectors noted that, since the inspection in 1995, significant program progress had been made with retesting MOVs (to establish a new baseline) using the VOTES diagnostic system. Strengths identified in the licensee's GL 89-10 program included the number of MOV dynamic tests performed and diagnostic system improvements. The licensee planned to complete the MOV program during the summer of 1996. However, the inspectors noted weaknesses in the justification for valve thrust requirement predictions and stem friction coefficient/rate of loading assumptions for valves not dynamically tested prior to program closeout.

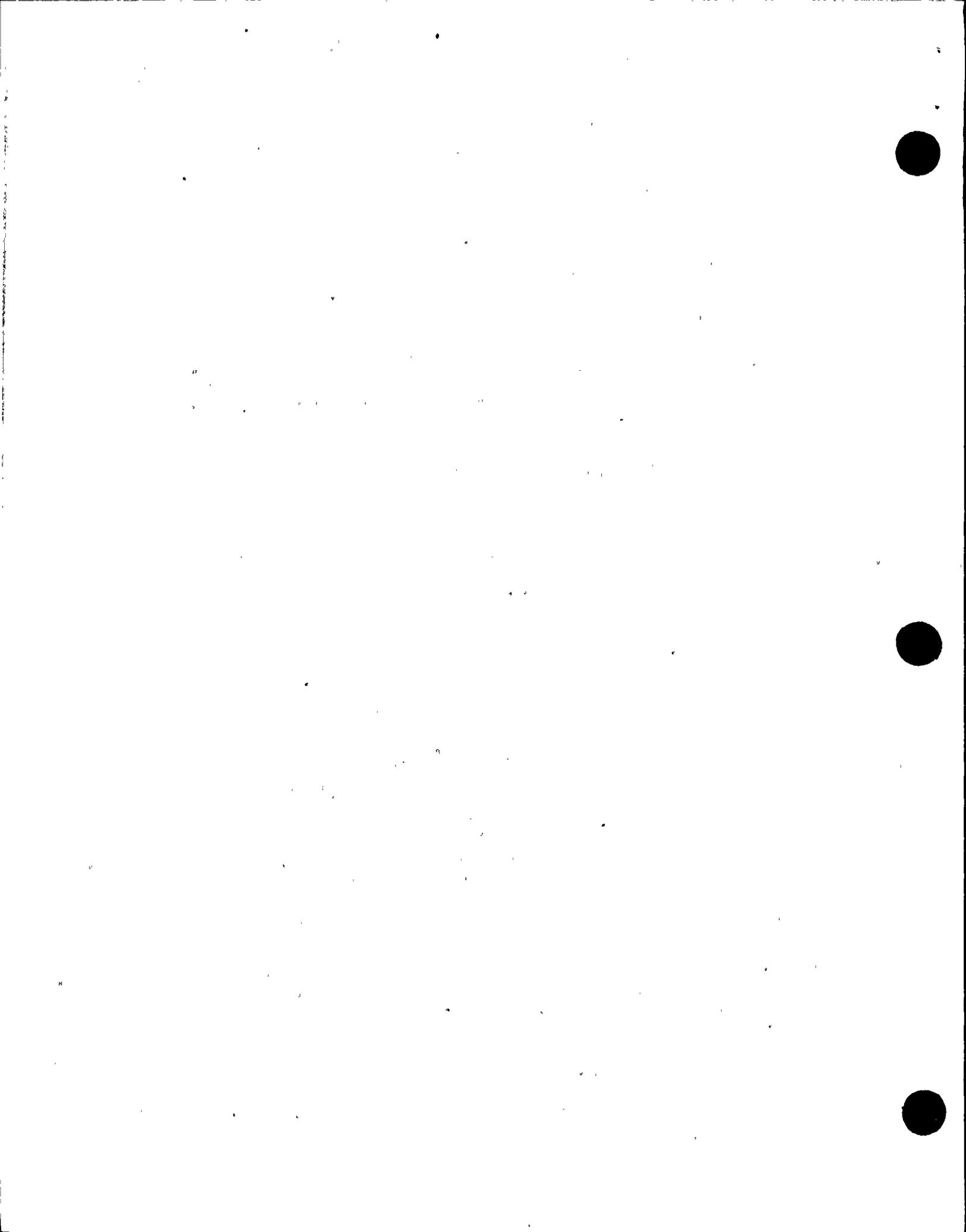
E4 Engineering Staff Knowledge and Performance

E4.1 Inservice Inspection - Observations of Work Activities and Data Review

a. Inspection Scope (73753 and 73755)

The NRC inspectors observed ISI personnel and reviewed data recorded during these activities to determine compliance with ASME Code and NRC requirements. Inspectors observed Southwest Research Institute (SWRI) personnel performing the following activities:

- Dye penetrant testing (PT) and ultrasonic testing (UT) of 4" diameter pressurizer vent line weld (2-RC-22-14).
- PT testing of 8" diameter safety injection line weld (2-SI-62-02S).
- UT of steam generator (SG) head to shell weld (STM-24-10).
- UT of SG-24, pipe to inlet nozzle weld (STM-24-02).



- UT equipment calibrations for welds 2-RC-22-14 and STM-24-10.

b. Observations and Findings

During PT of weld 2-RC-22-14, developer brand "Dubl-Chek" was checked out from the tool shop. ISI personnel noticed it was not an approved brand of developer after the spray can failed to operate during the PT. No certifications or labels were present to indicate that this developer was free of detrimental materials (fluorocarbons, mercury, halogens) and no product expiration date was identified. ISI personnel checked out and used Ardrex brand of developer (specified by procedure DCC-PT1 revision 1), to complete the PT. The inspectors' questions prompted licensee personnel to document this issue on a condition report (96-0562).

Code reportable indications were detected and sized at SG-24 inlet and outlet nozzle welds (at locations corresponding to indications detected and documented during the 1988 ISI). Inspectors noted that these indications had almost double the signal amplitude of the indications recorded during the previous inspection. Licensee personnel attributed this change in amplitude to changes in the sensitivity used for calibration settings of the ultrasonic equipment, and due to the new calibration block used.

During licensee reviews of ultrasonic data for the eight reactor vessel nozzles, it was determined that ultrasonic equipment gain adjustments were set 20 DB below the required settings of procedure 12 FPH SP 067 rev 1, change sheet 2. These gain settings resulted in a scanning sensitivity estimated to be a factor of ten below the required scanning sensitivity and invalidated the UT calibration settings specified in the ASME Code. The licensee did not take credit for the examination performed and committed to issue a relief request to the NRC, requesting to defer the Code examinations of the reactor vessel nozzles until the fall of 1997. This problem was documented on condition report 96-0672.

Although requirements of procedure 12-FPH.SP.067 were not met, there was no actual safety impact since the licensee did not take credit for the examination. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy (50-316/96005-05(DRS)).

c. Conclusions

The failure to use proper gain settings for ultrasonic equipment during automated ultrasonic examinations of the reactor vessel nozzles and the attempted use of an unapproved PT developer indicated that opportunities existed for improvement in execution of the ISI program.



E5 **Engineering Staff Training and Qualification**

E5.1 Inservice Inspection - Qualifications of NDE personnel

a. Inspection Scope (73753)

Inspectors reviewed ISI personnel qualifications and certifications for compliance with ASME Code, SN-TC-1A and applicable NRC requirements.

b. Observations and Findings

Inspectors reviewed SWRI procedure 2.0-NDES-101 "Nondestructive Examination Personnel Qualification and Certification." For this outage, the ANII and licensee personnel had not reviewed this document, to verify that SWRI NDE certification training met SNT-TC-1A requirements. The ANII and licensee personnel had reportedly relied on SWRI provided certifications of NDE personnel and had not independently reviewed SWRI NDE training document 2.0-NDES-101.

c. Conclusions

The lack of licensee or ANII reviews of the qualification training document for SWRI NDE personnel, indicated that opportunities existed for improvement in oversight of the ISI program. No violations or deviations were identified.

E8 **Miscellaneous Engineering Issues (92902)**

E8.1 (Closed) Unresolved Item 315/316/93006-03: Application of the OATIS inaccuracies revealed that some torque switches were set at a point greater than the motor capability under design-basis conditions. The licensee changed the diagnostic equipment to the VOTES system and reperformed all baseline testing. Appropriate VOTES diagnostic system inaccuracies were considered in setting torque switches with no concerns noted.

IV. PLANT SUPPORT

S1 **Conduct of Security and Safeguards Activities**

S1.1 Temporary Instruction 2515/127, "Access Authorization"

a. Inspection Scope (TI 2515/127)

Areas examined during the inspection included all relevant aspects of the access authorization program as identified in TI 2515/127 and included a selective examination of procedures and representative records, interviews with personnel, and observations of activities in progress.



b. Observations and Findings

Access Authorization Program - Administration and Organization

Overall program implementation was conducted in an excellent manner. The knowledge and competence of the staff was a program strength. Consolidation of access authorization (AA) functions under the direction of the Property Protection Department was also considered a program strength.

The licensee's security plan commits to implement all elements of Regulatory Guide 5.66 to satisfy the requirements of 10 CFR 73.56. The licensee's procedures provided adequate detail to those responsible for implementing the program.

Staffing levels were adequate. The program staff consisted of an Access Control Supervisor, a Fitness for Duty Administrator, a Screening Services Coordinator, a Fitness for Duty Clerk and Access Control Clerk. All individuals are cross-trained in both fitness for duty and access authorization. Additionally, there were support staff from the security contractor that provided screening review functions. The Access Control Supervisor reported to the Plant Protection Superintendent. Staff personnel interviewed were knowledgeable of program responsibilities and procedures. This aspect of the program was a strength. A strong sense of ownership was evident.

AA program implementation in 1992 was initially very fragmented. Aspects of the program were performed by property protection, human resources, corporate offices and more than eighty-five self-screeners. Over the past several years, the program was consolidated under the control of the Property Protection Department. Such consolidation resulted in more timely and direct oversight and resolution of potential problems.

One vendor performed all of the licensee's background investigation (BI) functions except for three contractors that completed BIs for their own employees. The inspector reviewed the licensee's "Letter of Agreement" with their screening vendor and found it to be adequate. The inspector reviewed the contract agreement letters with the self-screening contractors and found that the self-screeners committed to performing work in accordance with a specified licensee access authorization procedure. No deficiencies were identified.

Background Investigations

The licensee's background screening investigation program was implemented in an excellent manner. Good communication existed between the licensee and the screening vendor on cases being investigated.

The inspector reviewed records and conducted interviews and verified the adequacy of the licensee's program to verify true identify of an applicant and to develop information concerning employment, education,



credit, and criminal histories; military service; and the character and reputation of an individual prior to granting them unescorted access to protected and vital areas.

The inspector reviewed the results of the background investigation files of 20 licensee and contractor employees.

In these files, the scope and depth of background investigations satisfied NRC regulatory requirements and provided an adequate level of background information on which to base a determination for access authorization. BI files showed a "best effort" to obtain and document required information to address an applicant's employment history, education history, credit history, criminal history, military service, and the applicant's character and reputation. The licensee verified identity by photo driver's license prior to granting unescorted access and issuing a badge. In those cases where derogatory information was developed, the licensee adequately, and in a timely manner, reviewed and evaluated the derogatory information. At a minimum, this included an interview with the employee concerning the adverse information.

Psychological Evaluations

Psychological tests were controlled, administered, and proctored in an adequate manner. The inspector reviewed the licensee's procedure and practice for completing the required psychological testing and evaluations. The licensee contracted for psychological evaluation services. The Letter of Agreement for the psychological evaluation services was reviewed and considered adequate to satisfy regulatory requirements.

The licensee used the Minnesota Multiphasic Personality Inventory II for the initial psychological evaluations. The inspector observed that MMPI-2 test booklets were maintained in secured cabinets within the occupied plant protection office suite area. The psychological test booklets were controlled by the access authorization staff and administering the test was proctored by designated Plant Protection staff members. If necessary, follow-up evaluations were completed by a psychologist licensed to perform such services.

The inspector verified through interviews with several personnel administered the test that the examinations were controlled and protected in an adequate manner. Record review showed that identity of the person was confirmed before taking the test.

Behavior Observation Program

The continuous behavior observation program (CBOP) was considered good. Supervisors and others received training and were aware of program responsibilities. The Employee Assistance Program (EAP) opportunities were recognized by personnel interviewed and personnel believed that assistance would be provided in a confidential manner.



The licensee provided training in behavior observation to all of its employees and contractors (supervisory and nonsupervisory) as part of the General Employee Training that must be completed satisfactorily prior to being granted unescorted access. All permanent employees demonstrated their understanding of the topics on an annual basis to maintain their unescorted access to the protected area. In addition to the General Employee Training, supervisors viewed a forty minute video relating to Fitness for Duty to include behavior observation requirements. Each employee acknowledged receipt of a copy of the Cook Plant Site Orientation. This document also addressed CBOP self-reporting of arrests expectations. Supervisors also attended Employee Assistance Program sponsored seminars that provided practical information enhancing their sense of confidence in identifying and managing troubled employees. These seminars were conducted twice per year.

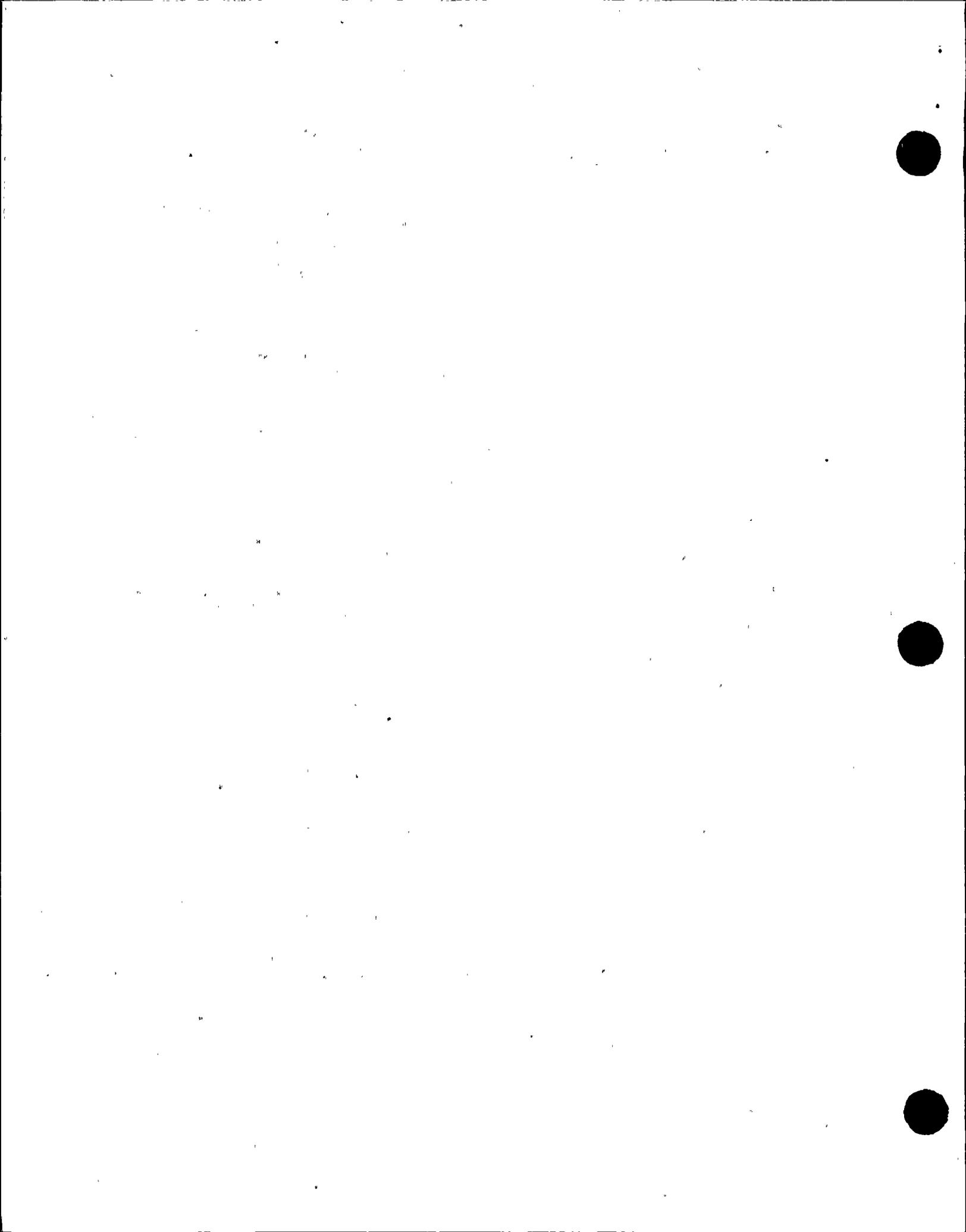
Inspection conclusions were based upon attendance at an annual requalification session of the General Employee Training, review of the applicable instructor lesson plans, review of the Site Orientation Booklet; and viewing the FFD videotape.

Interviews with supervisors showed that they were aware of EAP elements that were available to their personnel. Supervisors understood their responsibilities for behavior observation and stated that they knew their employees well enough to be able to identify aberrant behavior. Staff personnel interviewed were also aware of EAP assistance available to them and believed that the assistance would be provided in a confidential manner.

The licensee had also developed a method to monitor those personnel who have not been under a behavioral observation program during a thirty or more day period. For contractors, those personnel who have not used their security badge for 30 or more days, such personnel access authorization is terminated and the individual's activities are evaluated prior to the unescorted access being granted again. For licensee employees, the human resources department is responsible for notifying Plant Protection of those employees on extended medical or vacation beyond a thirty day period. Prior to the return of these identified employees, the access authorization staff assures that the activities of these individuals are evaluated.

Interviews with the supervisors and staff disclosed that they were aware of their responsibility to notify supervision or Plant Protection if arrested. Tracking, evaluation, followup interviews, and documentation by access authorization staff of arrests was performed in an excellent manner and was considered a program strength. Staff personnel routinely review local newspapers for reports of arrests and a determination made if the individual has unescorted access at the Cook Plant.

Unescorted Access Authorization - Grandfathering, Reinstatement, Transfer, and Temporary



The licensee developed an effective program for the granting of unescorted access authorization concerning the categories of "grandfathering," reinstatement, transfer, and temporary access.

The inspector reviewed the licensee's access control records to determine if the licensee correctly "grandfathered," reinstated, transferred, or granted temporary access authorization. The review showed that the licensee appropriately utilized these provisions. The inspector reviewed the case files for five individuals for each of the categories noted above. No discrepancies were noted.

The inspector also determined that the licensee tracked personnel granted temporary unescorted access to ensure that the 180 days time limit for temporary access was not exceeded. Security badges assigned to those granted unescorted access were programmed to expire in 180 days after issuance.

Denial/Revocation of Unescorted Access

Licensee actions concerning decisions to deny unescorted access met program requirements and NRC regulatory requirements. Appeal case files were complete and addressed matters appropriate to the appeal decision.

The inspector reviewed the case files of all individuals involving revocation of unescorted access. Each case file was well documented as to the reason for denial or revocation, and contained the required notification of access denial, and the right to appeal identified in letters to the individuals. Appropriate background and supportive documentation was within each reviewed case file. A decision could be rendered based upon the content of the files. The decision to deny unescorted access upon appeal was reviewed by the Property Protection Superintendent. The licensee's procedure also provided that if the decision upholds the denial/revocation of an access authorization, the individual may resubmit the appeal to an Assistant Plant Manager who will render a final decision within ten working days.

Protection of Personnel Information

The licensee implemented an effective system to provide for the protection of personnel information to prevent unauthorized disclosure. Access authorization and human resources staff personnel were sensitive to the need to protect private and personal information obtained during the access authorization process. Personnel completed consent forms prior to the initiation of the access authorization process.

The inspector observed that records were maintained at two onsite locations (protected area and owner controlled area). The licensee indicated that there were some records maintained at the licensee's corporate office in Columbus, Ohio. The inspector reviewed the physical protection practices at the two site records storage locations and found



them to be adequate. The licensee stated that the protection requirements at their corporate office was reviewed during quality assurance audits and found to be adequate.

Individuals applying for unescorted access were advised about the type of records that are produced and retained, the duration of such records, their right to review and correct any information that may be incorrect, and the right to withdraw consent for obtaining records and background investigations. The inspector confirmed by a random selection of records that no elements of the background investigation were initiated prior to the consent form being signed.

Audits

The inspector's review of audits conducted of the licensee's access authorization program showed that the minimum audit requirements were met. Licensee conducted audits were thorough, complete and effective in uncovering weaknesses in the access authorization area.

The inspector confirmed that annual audits were completed for the three contractors/vendors approved by the licensee to complete background investigations for their personnel and of the contractor (Confidential Services, Inc.) that performed the licensee's background investigations. The audits were performed by the utility group NEI. The scope of the audits equalled or exceeded the minimum audit requirements identified in Section 13 and Attachment A to NUMARC 89-01, an attachment to RG. 5.66. The licensee evaluated the audit results and the impact of the audit findings on their program.

Record Retention

The inspector reviewed the licensee's record retention activities to ensure required records were retained for the appropriate time period. The licensee's access authorization procedure identified five years as the retention period for access authorization records. 10 CFR 73.56(h) requires that access authorization records be retained for the entire duration of access and five years after termination. This was noted regarding records relating to audits of the psychological assessment function. This issue will be considered an unresolved item pending review of the licensee's actions (50-315/316/96005-06(DRS)). The licensee's access authorization procedure also required that self screeners must contact the Cook Plant to verify that record retention requirements have been complied with prior to purging screening records.

c. Conclusions

No violations of NRC requirements were identified during this inspection. One unresolved item pertaining to audits of your psychological assessment was noted and is addressed in the section on records retention. Within the scope of this inspection, the Access Authorization Program adequately met the regulatory requirements of 10 CFR 73.56 and provided reasonable assurance that individuals who were

authorized unescorted access to the licensee's nuclear plant were trustworthy and reliable, and did not constitute an undue risk to the health and safety of the public as a result of their unescorted access to the nuclear facility.

The following items were considered program strengths:

- Management support for the program and the knowledge and level of professionalism of the licensee's access authorization support staff
- Consolidation of the access authorization functions under the administration of the Property Protection Department
- Tracking, review, and evaluation of arrests that may impact on individuals' trustworthiness.

No significant program weaknesses were noted.

V. Management Meetings

XI Exit Meeting Summary

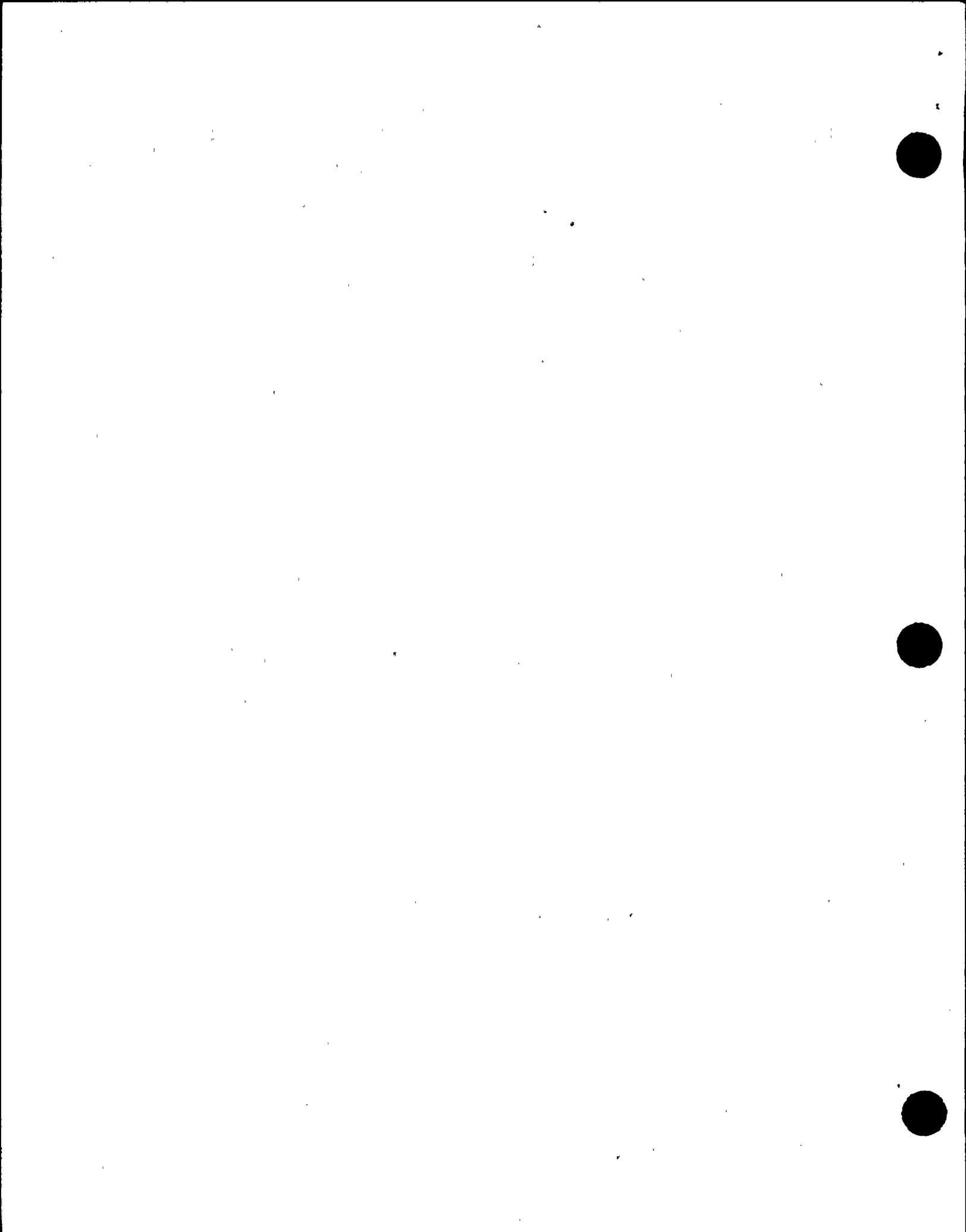
The NRC contacted various licensee operations, maintenance, engineering, and plant support personnel throughout the inspection period. Senior personnel are listed below.

At the conclusion of the inspection on June 4, 1996, the NRC met with licensee representatives (denoted by *) and summarized the scope and findings of the inspection activities. During this inspection debriefings were held periodically with licensee management. Some of the persons listed below were present for only some of the debriefings. The licensee did not identify any of the documents or processes reviewed by the NRC as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

- *A. Blind, Site Vice President
- *K. Baker, Assistant Plant Manager
- *D. Noble, Radiation Protection Superintendent
- *T. Postlewait, Site Engineering Support Manager
- *J. Wiebe, Superintendent, Plant Performance Assurance
- *J. Allard, Maintenance Superintendent
- *B. Gillespie, Operations Superintendent
- *J. St. Amand, Plant Engineering
- *D. Willemmin, Training
- *D. Morey, Chemistry Superintendent
- *C. Freer, Scheduling



- *M. Depuydt, Licensing
- *T. Quaka, Project Management & Inst. Services
- *T. Cummings, AEP/Site Design
- *M. Brown, Material Maintenance

INSPECTION PROCEDURES USED

- IP 61726 Surveillance Observations
- IP 62703 Maintenance Observation
- IP 71707 Plant Operations
- IP 73051 Inservice Inspection - Review of Program
- IP 73052 Inservice Inspection - Review of Procedures
- IP 73753 Inservice Inspection
- IP 73755 Inservice Inspection - Data review and Evaluation
- IP 93702 Prompt Onsite Response to Events at Operating Power Reactors
- TI 2515/127 Access Authorization

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

- | | | |
|---------------------|-----|--------------------------------------|
| 50-315/316/96005-01 | IFI | AFW flow retention/flow conservation |
| 50-315/316/96005-02 | NCV | Operator errors |
| 50-315/316/96005-03 | NCV | Inadequate staffing |
| 50-315/316/96005-04 | IFI | MOV degraded voltage |
| 50-315/316/96005-05 | NCV | UT gain settings |
| 50-315/316/96005-06 | URI | Records retention |

Closed

- | | | |
|---------------------|-----|------------------------|
| 50-315/316/95012-01 | VIO | Debris in containment |
| 50-315/316/96003-03 | URI | Torque switch settings |