U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254, 50-265
License Nos:	DPR-29, DPR-30
Report No:	50-254/96-06, 50-265/96-06
Licensee:	Commonwealth Edison Company (ComEd)
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	April 17 - May 20, 1996
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EXECUTIVE SUMMARY

Quad Cities Nuclear Power Station, Units 1 & 2
NRC Inspection Report 50-254/96-06, 50-265/96-06

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six-week period of resident inspection; in addition, it includes the results of inspections by a regional radiation specialist and a regional safeguards inspector.

Operations

Personnel errors in operations included a wrong train event, and an improper processing of a procedure change for a control rod drive air header test. The inspectors noted examples of prompt and conservative decision making on the part of operations personnel with respect to identifying equipment inoperability and technical specification limiting condition for operation (LCO) entry. However, some decisions were not conservative, including one to consider high pressure coolant injection (HPCI) system operable with the steam exhaust line vacuum breaker isolated.

- Shift turnover meetings continued to be difficult to hear and were hindered by many outside distractions (Section O1.3).

- A non-licensed operator removed the wrong train of the reactor building closed cooling water system from service. Operators were not sufficiently attentive during the shift brief to understand which system was to be removed from service (Section O4.1).

- An improper procedure field change, associated with a test of a control rod drive scram air header, was an additional example of a violation cited in a previous inspection report (Section O4.2).

Maintenance

Personnel performance in the area of maintenance was poor. Personnel errors contributed to system configuration problems, rework and numerous industrial safety incidents during the inspection period. Procedure deficiencies contributed to the personnel errors.

- In accordance with an erroneous procedure, instrument maintenance technicians removed the wrong reactor protection system, source range monitor shorting links during a test. The test procedure did not receive proper review which was a violation of Technical Specifications (Section M4.2).

- Experienced maintenance workers misaligned the reactor vessel head, causing rework resulting in 2.76 rem of unnecessary radiation dose to workers (Section M4.1).

- Numerous industrial safety incidents pointed to a lack of attention to work practices and instructions (Section M8.1).

- Numerous material condition deficiencies continued to challenge operators (Section M2).

Engineering

- The licensee failed to maintain design control of dimensions on newly installed Unit 1 MSIV actuators. Engineers identified differences between the dimensions of the old and new actuators after one set of MSIVs failed a local leak rate test(LLRT) (Section E2.1).

- Three examples of poor engineering operability and design basis review pointed to the need for more rigorous engineering support and overview (Section E4.1).

- The licensee's LLRT program was comprehensive. The scope of testing for refuel outage Q1R14 was well defined and met 10 CFR 50, Appendix J requirements (Section E2.2).

Plant Support

- The licensee declared an Alert due to secondary containment damage from high winds. The inspectors noted good initial response from operations in assessing the damage, declaring the Alert, and initiating the Unit 2 shutdown (Section P1.1).

- A licensee audit of the effluent and solid radioactive waste and transportation programs identified continued problems with contractor oversight, worker personnel errors, and communications between work groups. (Section R1.2)

- Effluent releases remained low and solid radwaste shipments were properly classified and documented. (Section R1.1)

- System engineering oversight of radwaste systems was generally good. (Section R1.1)

- The licensee's oversight of the control room ventilation system did not ensure that all parameters were in accordance with the Final Safety Analysis Report design bases (Section R2.2).

- Implementation of the Access Authorization Program by the licensee was characterized by good performance in the areas of management support and overview, and in employee and supervisory awareness of program responsibilities (Section S1.1).

- Some psychological evaluation tests were not adequately proctored (Section S1.1).

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[1]Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports will not address all outline topics.

Report Details

Summary of Plant Status

Quad Cities Unit 1 remained in the Q1R14 refueling outage during the entire inspection period. Major activities included reactor refueling and reassembly, reactor water cleanup system (RWCU) modifications, residual heat removal (RHR) corner room structural steel modifications, and station blackout diesel generator tie-in to Unit 1.

Quad Cities Unit 2 was at or near full power until May 10 when the unit was shut down due to secondary containment damage resulting from high winds. At the end of the inspection period the unit remained shut down to perform maintenance activities and to modify RHR corner room structural steel support.

The following is a timeline of events which occurred during this inspection period.

May 8 — Emergency Notification System (ENS) call. ComEd identified that contractor-maintained background records had discrepancies. All ComEd sites were affected.

May 10 — ENS call. ComEd declared an Alert. Secondary containment was damaged due to high winds and possible tornado. Twenty-seven emergency sirens were inoperable.

May 17 — ENS call. The safety-related control room heating, ventilation, and air conditioning (HVAC) system was declared inoperable. The system was controlling temperature outside the required band.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors noted mixed performance regarding operability determinations. Operations personnel made some prompt and conservative decisions with respect to identifying equipment inoperability and technical specification LCO entry. During initial response to the May 10 storm damage, the shift quickly identified that secondary containment was damaged, declared an Alert condition, and began the unit shutdown (see Section P1.1). A shift engineer declared the SBDG inoperable after an air leak was discovered, despite being given poor technical guidance from engineering regarding the engine's operability (see Section E4.1). However, some decisions were not conservative, including one to consider the high pressure coolant injection (HPCI) system operable with the steam exhaust line vacuum breaker isolated (see Section E4.1).

Personnel errors included a non-licensed operator (NLO) removing the wrong train of equipment from service and a licensed operator implementing an improper procedure field change (see Sections O4.1 and O4.2).

O1.2 Core Reload Activities (60710)

The inspectors observed core reload operations from the refuel bridge. The fuel handling crew demonstrated attentiveness to reactor core configuration details, records, and communications. The detailed sign-off requirements initiated during the last outage and new requirements, that the fuel handling supervisor directly observe the insertion of fuel bundles into the core, appeared to be smoothly executed.

O1.3 Operations Shift Turnover Meetings (71707)

The inspectors frequently attended the operations shift turnover meeting to assess its quality. Noise from ventilation systems and from excessive personnel in the control room during turnover made communications difficult to hear. These distractions made routine control room evolutions more difficult. Towards the end of the inspection period, operations changed the location of the shift turnover meeting to a conference area outside the control room. Subsequently, inspectors observed improved shift turnovers and control room environment. Section O4.1 provides details of an incident where poor control room turnover performance may have contributed to a wrong train event.

O4 Operator Knowledge and Performance

O4.1 Operators Remove Wrong Heat Exchanger From Service

a. Inspection Scope (71707)

The inspectors reviewed the licensee's investigation and corrective actions after operators erroneously removed the "2B" reactor building closed cooling water (RBCCW) heat exchanger from service.

b. Observations and Findings

During the turnover for the evening shift on April 17, 1996, the Unit 2 (U2) unit supervisor stated that the "2A" RBCCW heat exchanger would be removed from service for repairs to the "stuck shut" temperature-control valve (TCV). Those involved with the task (two equipment attendants and a shift supervisor) were present at the turnover briefing. Later, when making job assignments, the U2 unit supervisor told one of the U2 equipment attendants (EAs) to review the procedure for swapping the RBCCW heat exchangers during his initial rounds as there was a controlled copy of the procedure in the field.

Prior to removing the Unit 2 RBCCW heat exchanger from service, the 1/2 RBCCW heat exchanger was placed into service without any problems. The

Shift Supervisor (SS) remained at the 1/2 heat exchanger while the EAs went to the Unit 2 side of the reactor building to remove the 2A RBCCW heat exchanger from service. The procedure directed the EAs to shut the TCV for the heat exchanger being removed from service and then to verify that the 1/2 heat exchanger TCV opens to accept the load. When the 1/2 TCV valve didn't respond as expected, the SS went to the U2 RBCCW heat exchangers and found that the EAs had removed the 2B heat exchanger from service. The SS immediately reported the error to the U2 unit supervisor who directed returning the 2B heat exchanger to service and removing the 2A heat exchanger from service as originally intended. The EAs thought they were supposed to remove the 2B heat exchanger from service, but had not verified that with the unit supervisor.

The licensee filled out a problem identification form (PIF 96-1483) and investigated the occurrence. The licensee's investigation identified poor communications and "insufficient degree of attention" applied as the root causes. Whereas all of the operators involved had attended the shift turnover meeting, none were formally briefed on the evolution.

On April 19th, management distributed the expectation that all work, except normal operator rounds, would be formally briefed. The briefing will consist of a discussion of the intended actions to complete a job; the specific unit, component, and train of the affected component including a "marked-up procedure" circling the proper unit and train in the procedures that call out multiple systems; and discussions on personnel and nuclear safety. Additionally, all the operators involved were counseled and acknowledged their roles in the event.

c. Conclusions

The inspectors reviewed the licensee's corrective actions for this event and determined these actions to be appropriate. However, this error indicated the need for better self check and communications within operations.

O4.2 Control Rod Drive Scram Air Header Test

a. Inspection Scope

The inspectors reviewed the licensee's performance of a test of the control rod drive (CRD) scram air header.

b. Observations and Findings

On April 25, 1996, the licensee performed a test of the CRD scram air header using "Unit One HCU Scram Air Header Leakage Test, QCTS 0900 Interim Procedure 96-0060, Procedure Field Change 2395." In accordance with the test procedure, operators reset a previously inserted reactor scram signal and noted that scram valves for at least 37 control rods failed to reset. Engineering determined the cause to be aged scram solenoid pilot valve diaphragms, which would not properly reseat. These diaphragms had been installed during the Unit 1 Q1R14 outage from

material purchased from another utility and dedicated for use at Quad Cities. The licensee replaced the defective diaphragms with Buna-N diaphragms, and was able to successfully reset the reactor scram signal. Engineering sent the defective diaphragms to SMAD for further analysis.

Following the test, the inspectors reviewed the procedure field change and compared it to the original procedure. The original procedure required the test to be performed with no fuel in the vessel. Operations and the system engineer changed the procedure to delete this requirement, and to add requirements for "all rods in" and "no control rod movements". The inspector identified that this change altered the intent of the procedure and, as such, notified the licensee. Technical Specification 6.2.D allows temporary changes to procedures if the intent of the procedure is not altered. Procedure Field Change 2395 did not meet the requirements of TS 6.2.D since the change altered the intent of the procedure. Technical Specification 6.2.C establishes requirements for procedures and procedure changes which are not temporary changes. Because it was processed as a temporary change, Procedure Field Change 2395 did not meet the requirements of TS 6.2.C.

c. Conclusions

The failure to properly control procedure changes revealed a continued deficiency in procedure processing identified in February 1996 (Inspection Report 50-254/265-96002). This procedure change was an additional example of **Violation 50-254/265-96002-01**. This was not cited as a separate violation because of insufficient time to implement corrective actions in response to the previous violation. ComEd was preparing corrective action for the previous violation at the close of the inspection period.

O8 Miscellaneous Operations Issues (71707)

O8.1 Institute Of Nuclear Power Operations (INPO) Evaluation Review

The inspectors reviewed the 1995 INPO evaluation of the Quad Cities station. The inspectors determined that the results of the evaluation were generally consistent with previous NRC evaluations. No additional followup is planned.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments (62703)

Personnel performance in the area of maintenance was poor. Personnel errors contributed to system configuration problems, rework, and numerous industrial safety incidents during the inspection period. The errors affected work activities which should have received very close scrutiny, including reactor protective system logic changes and reactor

vessel head reassembly. Procedure deficiencies contributed to the personnel errors. Finding and correcting root causes to equipment malfunctions continued to be a problem.

M2 Maintenance and Materiel Condition of Facilities and Equipment

M2.1 Continued High Number of Materiel Condition Deficiencies

The inspectors tracked materiel condition deficiencies that the licensee discovered, and assessed the more significant items with respect to corrective actions and licensee response.

- Unit 2 control rod positioning timer exhibited erratic operation and resulted in rod insertion during attempted rod withdrawal using the rod out notch override switch. The timer was replaced during the Unit 2 forced outage.

- An NLO found the "2B" main turbine gland seal exhauster motor breaker smoking and, as a result, the "2B" gland exhauster was tripped. Then the "2A" gland seal exhauster tripped shortly after an attempt to start it. The "2B" breaker was replaced with a breaker from Unit 1, and the gland seal exhauster was successfully started (Section M2.3).

- Operators placed both recirculation pump scoop tubes for Unit 2 in manual after problems with inadvertent runback of the "2B" recirculation pump. The licensee continued to troubleshoot to determine the cause (Section E4.1).

- The Unit 1 "1B" recirculation pump suction valve failed to close due to stem galling (Section M2.4).

- Operators found three of five RBCCW temperature control valves (TCVs) stuck in mid-position. In particular, the "2A" valve failed, was repaired, and failed again several days later (Section M2.2).

- Operators declared the "A" train of the standby gas treatment system inoperable. An operator found the heater contactor buzzing and chattering and the heater light off. The heater breaker was repaired.

- Three of six alternate rod insertion (ARI) vent valves failed to vent air from the scram air header during testing on Unit 2. The valves were replaced. Engineering was investigating the root cause.

- Operators opened GCB-34 in the switchyard resulting in the ring bus being out of proper configuration due to an air compressor problem. The air compressor was replaced several days later.

- On Unit 1, the licensee discovered cracks in two control rod blades. The blades were replaced.

- Operators noted excessive seat leakage past the control rod drive system header isolation valve on Unit 1 (Valve 1-0301-25) after replacement of the stem and disc. ComEd determined the new stem and disc separated due to improper staking of the connecting pin by the vendor. The licensee replaced the valve.

- Mechanical maintenance workers broke a corroded local power range monitor (LPRM) fastener under the Unit 1 reactor vessel during torquing operations. The licensee removed and replaced the damaged fastener. The licensee removed eight other LPRM fasteners for inspection and determined the other fasteners were acceptable. ComEd planned to have the failed fastener analyzed for cause of failure.

- The "2A" control rod drive pump failed a few days following an overhaul. The "2B" control rod drive pump motor required replacement during the inspection period, and its return to service was delayed due to improper electrical lug installation, and problems with repairs to the discharge valve.

- Scram solenoid pilot valves, which were slow in responding, were replaced.

- Control Rod Drive K-10 was starting to exhibit symptoms of seal degradation. The control rod drive was replaced.

With respect to the last two items listed above, engineering and maintenance teamed up on a proactive approach to replace the valves and the control rod drive.

The large number of equipment problems continued to challenge operators throughout the inspection period.

M2.2 Reactor Building Closed Cooling Water (RBCCW) System Temperature Control Valve (TCV) Failures Pose Potential Challenge to the Units (62703)

a. Inspection Scope

The inspector followed up on the licensee's response to continued problems with stuck RBCCW system TCVs.

b. Observations and Findings

The RBCCW TCVs were designed to maintain the desired RBCCW system temperature by throttling the service water outlet of the RBCCW heat exchangers. The service water system takes its suction from the Mississippi River and contains varied amounts of silt, depending on river conditions. These valves had a history of sticking and seat erosion, and were replaced with a different design in 1991. The newer

design had different trim characteristics which corrected some of the earlier problems. However, these newer valves were susceptible to sticking in mid-position. Operator actions when a stuck valve was discovered was to apply external force to free the valve. If this action was unsuccessful, the licensee normally took the valve out of service for disassembly, inspection, and repair.

The inspector performed a Problem Identification Form (PIF) search which indicated that these problems were recurrent. Operators had formally communicated a sense of urgency about the problem a year ago, as they determined there was risk to the plant and equipment if RBCCW temperatures were not adequately controlled. This condition was documented on the operator work around list. Corrective action to earlier PIFs was the implementation of procedure, QCOP 3700-04, "Periodic RBCCW System TCV Exercise". Upon issuance of the procedure, the problem was removed from the operator work-around list. This procedure, which was implemented on January 15, 1996, had not yet been performed when problems were again encountered in April and May of 1996. This resulted in three of five TCVs for both units being out of service.

c. Conclusions

The maintenance practice of forcing the valves to move freely, after they were found to be stuck, was a reactive work practice. From 1991 through 1995 operators tolerated the valve problems, which were essentially operator work-arounds, and did not actively communicate with licensee management or other work groups for long term resolution. When the valve cycling procedure was proposed as a potential solution, operators failed to effectively implement and test the procedure for effectiveness and frequency of use. In addition, engineering had not developed an effective solution to this problem over the past several years.

M2.3 Recurring Gland Seal Exhauster Problems on Unit 2 (62703)

The inspectors reviewed licensee response to the loss of both Unit 2 main turbine gland seal exhausters. On April 29, 1996, the licensee wrote PIF 96-1640 to address tripping of the "2B" Gland Exhauster due to a breaker fault. An attempt to start the "2A" Gland Exhauster was not successful. A gland exhauster was successfully placed back into service when plant workers installed a breaker from a Unit 1 gland exhauster.

The inspector performed a PIF search to determine whether this was a recurrent failure and found that there were five gland exhauster tripping events on Unit 2 since September 1993. The most recent events, occurring early in 1995, exhibited the same failure symptoms as the current event. The licensee was in the process of investigating the root cause of these failures. The inspector concluded that the licensee has failed to find and correct the root cause of this recurrent problem.

M2.4 Recirculation Pump Suction Valve, 1-202-4B, Failed to Fully Open Due to Stem Galling (IP 62703)

a. Inspection Scope

The inspectors observed maintenance and engineering activities during the repair and testing of the Unit 1 Recirculation Pump Suction Valve 1-202-4B. The inspectors also reviewed applicable portions of the UFSAR.

b. Observations and Findings

During the RHR logic test, Unit 1 Recirculation Pump Suction Valve 1-202-4B failed to fully open. Engineers and electrical maintenance mechanics used valve motor current measurements to determine that, as the galled valve stem moved through the packing, excessive current and torque resulted in the torque switch tripping. Corrective actions included removal of the high spots on the valve stem and adjustment of the torque switch to provide more margin to the trip setting. Several post-maintenance stroke tests showed satisfactory results. The root cause of the galling was suspected to be the design of the three-stage packing. The long term proposed solution was to replace the three-stage packing with single-stage packing in the future.

The inspectors reviewed the information in Section 6.3 of the Updated Final Safety Analysis Report (UFSAR) related to recirculation pump suction valves. During this review, the inspectors identified UFSAR Figures 6.3-12 and 6.3-13 required the recirculation pump suction valves to close on low pressure coolant injection (LPCI) loop selection logic. However, upon review of the electrical drawings, the inspectors noted that the suction valves did not receive an automatic close signal from the LPCI loop select logic. The licensee stated that a modification removed the close logic signal to the valves but that the two UFSAR figures were missed during revision of the UFSAR. The licensee planned to revise the figures in a future UFSAR change submittal.

c. Conclusions

The inspectors concluded that the licensee interim actions to repair the valve stem and adjust the torque switch were adequate but that the root cause of the stem galling had not been fixed. In addition, UFSAR updates related to recirculation pump suction valve closure logic, had not properly reflected plant modifications.

M3 Maintenance Procedures and Documentation

M3.1 Incomplete Documentation of Electro-Hydraulic Control System (EHC) Tuning Activities (62703)

a. Inspection Scope

The inspector reviewed the completed work package used for EHC system tuning and functional testing. The work package consisted of a series of guidelines provided by General Electric (GE) for this system.

b. Observations and Findings

After EHC tuning problems caused a Unit 2 reactor scram in 1995, the licensee initiated an effort to improve the outdated GE guidelines used for EHC tuning, to improve the station expertise in this area, and to develop station procedures for this work.

During the current outage on Unit 1, GE and instrument maintenance technicians (IMs) worked closely to document the proper method for EHC tuning, while actually performing the work. While reviewing the work package, the inspector found that, in many cases, GE performed additional checks on the system and provided added notes to the work package to assist in the development of station procedures. However, in a few portions of the tuning process, including the functional test, the inspector found no evidence in the work package that these additional items had been documented. The inspector spoke with the IM foreman who confirmed that the work had been completed, but work package notes not documented.

c. Conclusion

Much of the EHC tuning work was properly documented with additional information necessary to upgrade the outdated GE guidelines to station procedures. However, in a few cases, the inspector found that the guidelines were not marked-up several weeks after the work was performed, which hindered the ability to update the procedures with valuable maintenance information.

M4 Maintenance Staff Knowledge and Performance

M4.1 Reactor Head Misaligned During Reactor Reassembly (62703)

a. Inspection Scope

The inspectors followed up on an event where the reactor head was misaligned by one bolt hole during reactor reassembly following refueling operations. During the followup, the inspectors reviewed Maintenance Procedure QCMM 0201-51 "Reactor Head Replacement" and discussed the event with maintenance department management. The inspectors also reviewed PIF 96-1643 which the licensee generated to investigate the event.

b. Observations and Findings

The reactor head replacement procedure contained a step, used to ensure proper alignment, which involved lining up GE nameplates installed on the reactor head and vessel flanges. The information provided in the step was accurate but did not include the fact that a third nameplate existed on the bulkhead. Additionally, the work was performed with the cavity flooded in order to lower radiation levels in the work area. The water covered the vessel flange, making it more difficult to see the vessel flange name plate. The maintenance crew incorrectly aligned the reactor head nameplate to the bulkhead name plate. A different crew of maintenance mechanics identified the misalignment approximately 12 hours after the reactor head was initially set. At the time of discovery, the vessel head studs had been installed but not tensioned. An additional radiation dose of about 2.76 person-Rem was incurred by workers during the rework activity to correctly set the reactor vessel head.

As part of the corrective actions, the licensee instituted a procedure change to provide additional clarification to disregard the bulkhead nameplate. The inspectors questioned the mechanical master regarding the experience and knowledge of the maintenance staff with respect to this particular evolution and found that several experienced maintenance mechanics familiar with reactor head installation were involved in this work.

c. Conclusions

Lack of knowledge and questioning attitude on the part of experienced maintenance mechanics coupled with imprecise procedural steps resulted in reactor head misalignment. Failure to follow the procedure correctly was a violation of TS 6.2.A. This licensee-identified and the corrected violation is being treated as a **Non-Cited Violation (50-254/265-96006-01)**, consistent with Section VII.B.1 of the NRC Enforcement Policy.

M4.2 Due to Procedure Error, Wrong SRM Shorting Links Removed

a. Inspection Scope (61726)

The inspectors followed up on an event where instrument maintenance (IM) technicians removed the wrong source range monitor (SRM) shorting links due to a procedure error.

b. Observations and Findings

Prior to loading fuel on Unit 1, nuclear engineers determined the scram function of the SRMs was not properly verified with the shorting links removed. The IM department developed a work package to ensure proper testing of the RPS SRM high trip function.

During testing of SRM 21 on Unit 1, IM technicians did not receive the expected RPS channel "B" half scram alarm. The technicians backed out of the procedure and documented the condition on a problem information

form (PIF 96-1488). Subsequent troubleshooting determined the SRM scram signal was not received due to the procedure requiring the technicians to remove the wrong SRM shorting links.

Although, the IM department had prepared and independently reviewed the work request associated with this test (Work Request 960040026), the independent review of the procedure had not detected the error. Later, Maintenance determined the electrical drawings were misread during the procedure preparation.

The inspectors reviewed the work package and determined the RPS test did not receive a 10 CFR 50.59 review for the potential of an unreviewed safety question as required by the technical specifications. Although the SRM RPS function was described in Section 7.2.2.5 of the UFSAR, testing of the SRM RPS function was not described in the UFSAR.

c. Conclusions

The inspectors determined that oversight of the testing and temporary modification of this important safety system was poor. ComEd tested SRM inputs to the RPS using Work Request 960040026, but did not have a written safety evaluation prepared for the activity. The activity was not reviewed by station management. The inspectors determined this was a **Violation (50-254/265-96006-02)** of TS 6.2.C which required written procedures implemented by Regulatory Guide 1.33, Rev. 2, Appendix A, paragraph 8.b.2.1, be reviewed by station management and a written safety evaluation be prepared by a qualified individual. The inspectors also noted that the PIF review of the incident failed to recognize the need for proper oversight and review of testing procedures involving the reactor protection system. Section O4.2 discusses another example of a violation related to failure to properly control procedure changes.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 Increased Industrial Safety Incidents

a. Inspection Scope

The inspectors observed maintenance activities and reviewed work and problem identification records to evaluate the licensee's progress in resolving personnel safety issues.

b. Observations and Findings

During the period, numerous incidents occurred involving improper safety practices.

DATE	PIF	ISSUE
April 15	1435	A worker was injured while using a lathe.
April 22	1576	A worker fell off the refuel bridge ladder.
April 23	1564	A poor welding ground caused a feedwater valve to stroke, and melted instrument conduit.

April 30	1677	An air motor was used improperly, without a safety feature, resulting in personnel injury.
April 30	1694	A fire in the RHR corner room was caused by poor cutting and housekeeping practices.
May 2	1694	A repeat electrical shorting problem occurred when a ventilation filter was being removed.
May 4	1705	An electrician was shocked due to operators improperly reviewing caution and out-of-service (OOS) tags, and due to poor electrician work practices.

The inspectors observed additional safety problems including failure to wear hard hats in required areas, poor scaffolding removal techniques in the Unit 1 Reactor Core Isolation Cooling (RCIC) room and lack of fall protection for workers on the edge of the reactor building roof. The licensee was addressing the issues individually, and at the end of the period was taking steps to increase worker awareness of industrial safety issues.

c. Conclusions

The inspectors reviewed the individual incidents, and determined that most could have been avoided with better worker sensitivity to accepted safety practices, or improved supervisory involvement and oversight. Two electrical shocking issues were of particular concern because the issues involved were close repetitions of previous problems. Corrective actions from the previous issues were not effective. Also of concern was the use of the air motor without a safety feature intended to prevent injury from rotating parts. Licensee investigation found this to be broader than just this one incident. The inspectors will review the licensee's safety practices as **Inspector Follow-up Item (50-254/265-96006-03)** following the licensee's investigation completion.

III. Engineering

E1 Conduct of Engineering

E1.1 Test Director Inattentiveness During Modification Testing

a. Inspection Scope (71707)

An inspector observed personnel inattentiveness in the control room and began a review of the licensee's corrective actions in response to the inattentiveness.

b. Observations and Findings

While performing routine control room inspections, an inspector noted that a modification test director appeared to be inattentive. The inspector notified the shift engineer. The shift engineer approached the test engineer, saw that he appeared to be asleep and immediately stopped the test. Later the shift engineer generated PIF 96-1832 to document the event and initiate an investigation.

The licensee's preliminary investigation showed that the test director had communicated with other individuals about one to two minutes prior to discovery of the apparent inattentiveness. The test director stated that he had not been sleeping, and that he was not approaching any Generic Letter 82-12 limits on hours worked.

c. Conclusions

The inspectors concluded that the shift engineer took proper actions by stopping the test and generating a PIF to investigate the event. At the end of the inspection period, the licensee had not finished the investigation. The inspectors did not determine if the problem was more widespread, and considered this to be an **Inspector Follow-up Item (50-254/265-96006-04)** pending review of licensee corrective actions.

E1.2 Deferred Diagnostic Evaluation Team (DET) Items

The inspectors noted that a number of materiel condition corrective actions referenced in a licensee response to the 1993 Diagnostic Evaluation Team inspection had not been completed by target dates. The inspectors discussed this with ComEd management. At the close of the inspection period the licensee was preparing a list of items that had not been completed, with reasons for postponement or cancellation of the corrective action.

E2 Engineering Support of Facilities and Equipment

E2.1 Spacer Plates Inadvertently Left Installed in MSIV Actuators

a. Inspection Scope (37551)

The inspector reviewed the licensee's assessment of the material condition of the MSIVs following post maintenance local leak rate tests (LLRTs).

b. Observations and Findings

During refueling outage Q1R14, the licensee replaced the actuators for all the inboard MSIVs and performed post maintenance LLRTs. All test results were acceptable except those for the 1D and 2D MSIVs. During investigation of the cause of the failed LLRTs, the valve group determined that the new MSIV actuator dimensions were slightly different than those for previous actuators. Specifically, the new length of the piston rod to the coupling spider was 10 inches versus 11 inches for the old actuators. With the 11-inch piston rod length, the licensee installed 1-inch spacer plates to allow the valve stroke to be adjusted to the center of its range. However, with the new 10-inch length, the spacer plates were no longer needed, but were inadvertently left in place.

Engineering performed an evaluation to leave the spacer plates installed until the next maintenance outage. With the spacer plates installed,

maintenance took measurements of closing force for all the MSIVs and found the 1D and 2D closing force to be too low, which explained the failed LLRT. Stroke adjustments were made to all the MSIVs to ensure adequate closing force within the acceptable actuator adjustment range.

After the stroke adjustments, the licensee performed LLRTs on all the MSIVs. The 1D/2D MSIVs passed the test, but the 1B/2B MSIVs failed. Measurements revealed adequate closing force. The licensee suspected crud build-up obstructed the valve seat enough to allow excessive leakage. After flushing, a repeat LLRT had satisfactory results.

c. Conclusions

The inspectors plan to review the licensee's justification and 10 CFR 50.59 evaluation of the spacer plates remaining in place. This is an **Inspector Follow-up Item (50-254/265-96006-05)**.

E2.2 Local Leak Rate Test (LLRT) Program Inspection

a. Inspection Scope (70307, 70313)

The inspector performed a detailed review of the licensee's Containment Leak Test Program under QCTP 0130-01, Rev. 4, and conducted interviews with the program coordinator to evaluate the adequacy of the licensee's program. The inspector observed four LLRT tests and also reviewed all PIFs concerning LLRTs generated during the Q1R14 refueling outage.

b. Observations and Findings

The inspector reviewed the licensee's running tabulation of containment minimum flow path leak rate "as found" test results to determine whether pre-established limits for total containment leakage reportability were met. The licensee's total leakage was within allowed limits and below the threshold for reportability. Calibration dates for the LLRT test box pressure gauge and flow meters were found to be current. The inspector reviewed LLRT Test Director certification records and found them to be properly documented.

The inspector reviewed the test results for many LLRTs performed during the outage and directly observed LLRT tests on the following valves:

- MO 1-1001-26A, Drywell Spray Inboard Isolation Valve
- AO 1-203-1B/2B, Main Steam Isolation Valves
- 2251-2-81B, H2/O2 Analyzer Sample Line Valve
- CK 1-1101-15, Standby Liquid Control System Check Valve

Several procedural, documentation, communication and consistency problems were noted during this comprehensive review. However, the inspector found that while these problems contributed to testing inefficiencies, they did not impact the test validity. Examples of these problems are listed below:

- The interaction between the specific LLRT QCTS 0600 series procedures and the procedure directing use of the test box, QCTS 0600-01, created a somewhat complex procedure interaction that could pose an unnecessary challenge to Test Directors.

- LLRT test data sheets did not consistently list the acceptance criteria for the valve under test.

- LLRT test data sheets did not consistently use key wording, i.e., "warning" and "alarm" vs "alert" and "required action," to indicate when a threshold was reached.

- Weak communication and scheduling nearly resulted in an invalid LLRT test. The post-maintenance stroke test had not been performed when the LLRT test group had initiated the LLRT test.

The inspector reviewed a listing of approximately 35 LLRT-related PIFs generated during the Q1R14 refuel outage. Evaluation of the majority of the PIFs primarily indicated test failure conditions. The licensee's program requires that all valves with valid failures be corrected to below the alarm value prior to unit startup. The PIFs were used to identify the root cause of valve failure. All failed valves had been repaired and retested.

c. Conclusions

The inspector found that the licensee's LLRT test program under QCTP 0130-01 was well defined, and met 10 CFR 50, Appendix J requirements. Communications were effective between working groups and departments. Timely recording of "as found" leakage provided an accurate current account of total containment leakage. The licensee demonstrated an aggressive approach to identifying problems and effecting repairs. The inspector identified several minor deficiencies in the testing process and in procedures.

E2.3 Inspector UFSAR Review

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR description. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected. Some inconsistencies were identified and are described in Sections M2.4, R2.1, and R2.2. The licensee began a more comprehensive approach to reviewing UFSAR discrepancies late in the inspection period.

E3 Engineering Procedures and Documentation

E3.1 Open Operability Evaluations

The inspectors reviewed the three open operability assessments affecting Unit 2. Engineering reported that no open operability issues existed on Unit 1. The three Unit 2 operability concerns required restoring the margin of safety specified in the original design of supports and structures for three separate structures/systems. These included RHR corner heat exchanger structural steel, Mark I small bore piping supports, and the Atmospheric Containment Atmosphere Dilution (ACAD) Containment Atmosphere Monitor (CAM) piping supports. ComEd planned to restore the margin in each of these cases prior to the Unit 2 startup.

E4 Engineering Staff Knowledge and Performance

E4.1 Engineering Guidance to Operations on Operability Questions (37550)

a. Inspection Scope (73051)

The inspectors reviewed several instances where engineering was required to provide guidance to operations on equipment operability. The scope only included instances where the inspector felt the potential for non-conservative guidance existed. Three examples were reviewed in depth.

b. Observations and Findings

After an operator discovered an air leak on the Standby Diesel Generator (SBDG) air start motors, engineering personnel reported to the shift engineer that the engine was operable. However, when operations wanted to test run the SBDG, the engineering advice to the shift engineer was that the crew should not run the diesel generator because the air leak could be caused by foreign material. Foreign material could damage the motors, if started. The shift engineer conservatively called the diesel inoperable until the leak was fixed the next day. Although the issue was resolved satisfactorily and the equipment deemed fully operable, system engineers initially provided non-conservative advice to the shift engineer.

Following inspector discussion of the issue with licensee management, engineering management reviewed this event with the engineer involved. Engineering believed the problem was caused by poor communication. ComEd planned to followup with the system engineers regarding operability assessments and communications.

Another instance involved the licensee tagging the Unit 2 HPCI steam exhaust vacuum breaker isolation valves "2-2399-40 and -41" closed. On April 23 the inspector observed that the valves were closed, and questioned the operability of HPCI in that configuration. Engineering had concluded, along with operations, that HPCI would be operable since several operating procedures referenced the valve closure.

Inspector review found that the licensee had not considered potential effects of water hammer in the exhaust line if HPCI were to automatically start, secure, and then restart. The inspector also noted that procedures were not in place to vent the HPCI exhaust line in the event of a manual restart. Upon review of the QCOS 2300-1, "Periodic HPCI Pump Operability Test," procedures which mentioned closure of the HPCI 40 and 41 valves, the inspector noted the procedures did not indicate that HPCI would be operable. Rather, the procedures indicated that with the valves closed, HPCI operation should be avoided except in an emergency or as directed by the shift engineer. The HPCI valves were shut for about 7 days, which was within the technical specification limiting condition for operation time limits for HPCI. The licensee notified the NRC on May 24, 1996, that HPCI had been inoperable due to the 40 and 41 valve closure, and planned to submit a Licensee Event Report.

Inspectors discovered the third issue on April 14 when the "2B" reactor recirculation (RR) pump speed controller exhibited erratic behavior in response to operator attempts to reduce pump speed. Pump speed appeared to decrease rapidly and not respond to operator attempts to control speed. Operators eventually stabilized the pump speed at about 68 percent, and locked both RR pump motor generator set scoop tubes. A level-three investigation was initiated (PIR 2-96-025).

Engineers and maintenance technicians began troubleshooting efforts to determine the cause of the problem. Maintenance history showed nine other RR speed control events since July 1994. During the troubleshooting process, operators unlocked the scoop tubes to reduce reactor power with RR speed controllers. Operators observed similar speed control problems with the "2B" controller at that time. The licensee then locked both scoop tubes, and planned further troubleshooting for an upcoming maintenance outage.

The inspectors reviewed the licensee's justification for operating with both scoop tubes locked up. This review included looking at the licensee's original 10 CFR 50.59 screening for a procedure change which allowed scoop tube locking. The March 1991 screening for the change to QCOP 202-12, "Reactor Recirculation MG Set Scoop Tube Local Manual Control," did not consider the effects that locking the scoop tubes would have on the loss-of-feedwater accident described in Chapter 15 of the UFSAR. During the limiting loss-of-feedwater accident, the RR pumps were expected to run back to minimum speed which would affect reactor power and reactor vessel water level. By neglecting to review the effect of scoop tube locking, the procedure change allowed for running the reactor recirculation systems in a configuration outside of that described in the UFSAR. A review subsequent to the inspector's questions was more thorough, and provided a basis for operation with the scoop tubes locked.

c. Conclusions

The inspectors noted that engineering guidance on operability of safety equipment in these situations was confusing and/or did not appropriately consider the technical basis for the determination. In one case, the shift engineer made the appropriate decision. In the two other cases reviewed, an appropriate basis for operability was not made until after inspector review pointed out problems.

E8 Miscellaneous Engineering Issues (92902)

E8.1 (Closed) Unresolved Item (50-254/265-94014-03): Loading of Motor Control Center (MCC) 18-2 Not Ensured by Design or Testing. The licensee reviewed an event at the Dresden Nuclear Station involving an electrical breaker tripping from normal loads. The licensee determined a similar condition also existed at the Quad Cities Nuclear Station and initiated paperwork to increase breaker trip settings. The licensee administratively restricted a large load on the MCC to prevent the MCC from tripping. The licensee modified the electrical load monitoring computer program to ensure the program detected electrical loads that exceeded cable ampacity. This item was the subject of NRC enforcement action as documented in Inspection Report 50-254/265-95011 and was tracked by EA 95-241. This item is closed.

E8.2 (Closed) Unresolved Item (50-254/265-96002-09): Residual Heat Removal Corner Room Steel Issue. The licensee previously identified structural beams in the RHR corner rooms did not meet UFSAR allowable stress limits. This issue was discussed in Inspection Report 50-254/265-96005. An enforcement conference was held May 1, 1996, and documented under Inspection Report 50-254/265-96007. This item will now be tracked under EA 96-115. This URI is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Effluent and Solid Radwaste and Transportation Programs

a. Inspection Scope (IPs 84750 and 86750; and TI 2515/133)

The inspectors reviewed the licensee's effluent and solid radioactive waste and transportation programs as described in the Updated Final Safety Analysis report (UFSAR), Process Control Program (PCP), and Offsite Dose Calculational Manual (ODCM). The review included records of effluent activity released, associated offsite dose calculations, radwaste shipping records and procedures, and system engineering oversight.

b. Observation and Findings

Gaseous and liquid effluent activity released (and associated doses) continued to be low. Activities released in 1995 were about 45 and

0.06 curies (Ci) gaseous and liquid effluents, respectively, excluding tritium. Activity released in 1996 to date, was for the most part consistent with 1995 data.

The licensee continued to ship waste to offsite vendors for processing and had been aggressively shipping waste since burial site access was reinstated in mid-1995. All radioactive material previously stored in the interim radwaste storage facility (IRSF) and in satellite storage areas had been shipped for burial or contractor processing. Licensee personnel were trained in the revised Department of Transportation (DOT) regulations and associated procedures were appropriately revised. The inspectors selectively reviewed shipment records and verified that they were consistent with the regulations and that radwaste was properly classified.

System engineers were knowledgeable of scheduled maintenance activities and were involved in determining maintenance priorities for the effluent and solid radwaste systems. Although each engineer routinely performed system walkdowns, the inspector identified one example where walkdowns were not documented in the system notebook as expected by licensee management.

c. Conclusions

Effluent releases (and associated doses) remained low and solid radwaste shipments were properly classified and documented. The licensee effectively implemented the revised DOT regulations. System engineering oversight of radwaste systems was generally good.

R1.2 Audits and Followup of Events

a. Inspection Scope (IPs 83750, 84750 and 86750)

The inspectors reviewed a March 18, 1996, station Quality Assurance (QA) audit of the effluent and solid radioactive waste and transportation programs. This review also included recent PIFs documenting findings in the above programs and focused on identified trends.

b. Observations and Findings

The audit was technically sound and, together with PIF findings, identified continuing weaknesses in contractor oversight, personnel performance, and communications between work groups. The inspectors reviewed the specific corrective actions for these findings. No problems were identified.

The inspectors reviewed a PIF (dated March 26, 1996) concerning the backflow of air from a chemistry laboratory fume hood. The backflow was caused when a downstream balancing damper failed closed, thereby increasing backpressure in the ventilation duct. The problem was originally identified in June 1994 and was the subject of two follow-up PIFs (September 1994, and February 1995) when it was identified that the

problem was not resolved. After the March 26 PIF, the spring was repaired, and the problem was resolved. Although the backflow may have existed since 1994, the licensee had not identified any spread of contamination indicating that it had occurred.

The delay in correcting the damper was caused by poor communication of system priorities between the chemistry and system engineering departments. Additionally, neither of the earlier PIFs discussed the UFSAR implications, and both were closed with the original problem remaining unresolved.

c. Conclusions

The licensee's audit of the effluent and solid radwaste and transportation programs, and associated PIFs, identified weaknesses with contractor oversight, worker personnel errors, and communications between work groups. These weaknesses reflected continuing overall station weaknesses in these areas.

R2 Status of RP&C Facilities and Equipment

R2.1 Review of Effluent and Solid Radwaste Processing Systems

a. Inspection Scope (IPs 84750 and 86750)

The inspectors toured the effluent and solid radwaste processing systems. The tours included verification of effluent process monitor operability and selected operational and design parameters as listed in the UFSAR and PCP. Records of maintenance, functional tests and calibrations of the effluent process monitors were also reviewed.

b. Observations and Findings

The systems were acceptably maintained and materiel condition was adequate. The licensee recently toured the infrequently accessed radwaste and condensate phase separator tank rooms and identified no additional evidence of corrosion or leakage (see Inspection Report 50-254/265-96003). The inspectors selectively reviewed system parameters (stack release flow rates, process monitor readings, etc.) and associated alarm and/or alert setpoints. No problems were identified.

No significant problems were identified during the inspectors' review of effluent process monitor system data, and associated calibrations and tests were performed in accordance with approved procedures which were technically sound. A review of control room indicators also identified no problems.

Several discrepancies were identified by the inspectors between the effluent and solid radwaste system diagrams contained in the Offsite Dose Calculational Manual (ODCM) and UFSAR. Specifically, the gaseous effluent flow path (Figure 10-1 of the ODCM) listed incorrect air flow rates, and the liquid and solid radwaste processing diagrams (Figures

10-3 and 10-4) did not indicate the current operating condition of the systems. The licensee planned to revise the ODCM diagrams and to review other applicable documents against the UFSAR (see Section R2.2).

c. Conclusions

Overall, the effluent and solid radwaste systems were maintained operable and materiel condition was adequate. Required functional tests and calibrations were performed, and the systems were operated as described in the UFSAR and PCP. Several inconsistences were identified between the ODCM and UFSAR which the licensee planned to address.

R2.2 Review of the Control Room Ventilation (CRV) and SBGT Systems

a. Inspection Scope (IP 84750)

The inspectors toured the CRV and SBGT systems and reviewed the results of functional and performance tests on the high efficiency particulate air (HEPA) filters and charcoal beds. The tours included verification of selected operational and design parameters as listed in the UFSAR.

b. Observations and Findings

The inspectors verified that routine functional and performance tests required by the technical specifications were performed on the CRV and SBGT systems. A review of HEPA and charcoal bed test results identified no significant performance trends.

During tours, the inspectors noted that the actual control room environmental conditions were not as described in the UFSAR. Specifically, Section 9.4.1.2 of the UFSAR specified that the control room be maintained at a minimum 40 percent relative humidity (RH) for protection of computer components. Based on discussions with the licensee and direct observation, the inspectors determined that the RH was below 40 percent, had not been appropriately controlled for several years, and that it was unknown when the humidifier had stopped working. However, no problems with computer equipment operation appear to have resulted from this condition.

The inspectors noted that the associated operating surveillance procedure (QCOS 5750-02, Revision 2) required that RH be maintained $\leq$ 40 percent which is different than the UFSAR. The procedure also required that control room temperature be verified $\leq 90^{\circ}F$, contrary to Section 9.4.1.1 of the UFSAR which specified that the temperature not exceed $80^{\circ}F$. However, the inspectors did not identify any occasions when control room temperature exceeded $80^{\circ}F$. The licensee was reviewing the matter and indicated that appropriate corrective action would be taken.

c. Conclusions

Required functional and performance tests for the CRV and SBGTs were performed as required. One difference between the UFSAR design and plant conditions was identified. This finding indicated that the licensee's oversight of the CRV system did not ensure that all parameters were in accordance with the UFSAR design bases. The inspectors will review this issue as **Inspector Follow-up Item (50-254/265-96006-06)** along with other items related to UFSAR conformance and 10 CFR 50.59 compliance (see Section R2.1).

R4 Staff Knowledge and Performance in RP&C

R4.1 Apparent Radiation Protection Violation by a Contract Worker (IP 83750)

On April 10, 1996, a contract worker alarmed a foot detector of a whole body frisker when attempting to exit the Radiological Protected Area (RPA). A subsequent hand-held frisk of the worker's shoes found no detectable contamination. Per licensee procedures, the worker reentered the whole body frisker for a recount. A radiation protection technician (RPT) observing the recount noted that the worker appeared to try to circumvent the foot monitor and the frisking procedure by turning his foot such that it was not over the detector during the recount. The RPT documented the event on a PIF. This potential procedural violation is considered an unresolved item and the event and the results of the licensee's investigation will be reviewed during a subsequent inspection (**Unresolved Item 50-254/265-96006-07**).

R8 Miscellaneous RP&C Issues

R8.1 (Closed) Unresolved Item 50-254/265-94026-04: Current control room ventilation and SBGT system surveillance procedures appeared inadequate to meet system design requirements. The licensee submitted a technical specification amendment to change the test criteria for charcoal to the revised industry standard (ASTM D3803-1989). This submittal was awaiting NRC approval. Interim procedures were also developed to require successful dual testing under the old (ASTM D3803-1979) and new standards. The inspectors verified that these actions were taken and reviewed recent control room ventilation and SBGT test results (see Section R2.2). This item is closed.

P1 Conduct of EP Activities

P1.1 Conduct of Emergency Preparedness During Alert

a. Inspection Scope (93702)

The inspectors observed and reviewed the licensee's response to an Alert condition caused by high winds and/or a possible tornado.

b. Observations and Findings

At about 2:20 a.m., (CDT) on May 10, 1996, minor damage occurred to 3 buildings on the plant site due to high winds or a possible tornado. There were no injuries to any workers and no radiological releases. Wind speeds up to 76 miles per hour were measured by permanently installed sensors at the site. Unit 1 had been shut down for a refueling outage. Unit 2 was operating at 100 percent power when the event occurred.

Pieces of sheet metal, torn from the reactor building by wind, damaged electrical cables from the station blackout diesel generator and severed nitrogen tank piping. Operators deenergized electrical power to the hydrogen tank farm due to exposed electrical lighting cables. Two buildings outside the protected area were damaged.

The reactor building, which provided secondary containment, sustained damage when about 100 feet of outer layer sheet metal was blown off. An inner layer of sheet metal remained in place. The licensee declared an Alert in accordance with ComEd's emergency plan at 2:32 a.m. and activated the Technical Support Center. Operators commenced shutting down Unit 2 due to secondary containment integrity being breached.

Four separate hazardous material spills occurred from the high winds. Each spill was cleaned up. There was no release of chemicals or radioactive material from these spills. A mixed waste storage building was damaged. Slightly radioactive hazardous waste containers stored in the building were not breached. Survey crews found no release of radioactive contamination.

At about 10 a.m., the licensee determined, through tests, that approximately one-third of the sirens in the emergency planning zone were disabled due to loss of electrical power. Appropriate emergency management agency officials were notified. ComEd determined that 27 of the 74 sirens within the emergency preparedness zone were inoperable due to loss of power. Electrical power to the sirens was lost due to high winds and lightning strikes. Power to the sirens was restored, and all the sirens were declared operable by 1:30 p.m. on May 11.

Inspections of the station switchyard found no damage. Offsite power, all emergency diesel generators, and all safety injection systems were operable.

c. Conclusions

The inspectors asked ComEd to provide calculations and safety evaluations to ensure that secondary containment and UFSAR design requirements could be satisfied without the reactor building exterior wall intact. The licensee initially indicated that secondary containment would be intact with only an inner shell. This item is considered an **Unresolved Item (50-254/265-96006-08)**.

The inspectors noted the licensee repaired the damaged public alerting system (sirens) in a timely manner. ComEd's emergency response to this event will be evaluated by **Inspector Follow-up Item (50-254/265-96006-09)**.

The licensee adequately addressed the hazardous material events. Chemical spills were contained and cleaned up. No chemical release occurred.

S1 Conduct of Security and Safeguards Activities

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

a. Inspection Scope (TI 2515/127)

The inspector reviewed those elements of ComEd's Access Authorization Program that applied to the Quad Cities site. The access authorization program was managed and administered by the corporate security office with site responsibilities being limited to the administration of onsite psychological tests; training and implementation of the behavioral observation program; and specific elements of the background investigation program, denial of unescorted access, and record retention. The inspector conducted interviews of cognizant program personnel, random supervisors, and plant personnel to verify program implementation.

b. Observations and Findings

Program Administration and Implementation

The knowledge and competence of site personnel responsible for implementation of the access authorization program was good as evidenced by inspector observation and staff interview results regarding program implementation activities.

The licensee committed in their security plan to implement all elements of Regulatory Guide 5.66 to satisfy the requirements of 10 CFR 73.56. Inspector review of selected licensee site procedures implemented to meet access authorization requirements showed that they were generally well written and their scope adequately addressed regulatory requirements.

Background Investigation Elements

The inspector determined through interviews that site access control personnel administered, and conducted an initial review of completed background investigation data contained in the licensee's security questionnaire. Their review was done to determine if relevant information may have been omitted by individuals that were being processed for unescorted access. Completed security questionnaires and the results of site staff reviews were sent to the licensee's corporate

security department for additional review and resolution of any problems.

Psychological Evaluation

Site involvement pertaining to psychological evaluation testing was limited to the administration of the Minnesota Multiphasic Personality Inventory (MMPI-2) for initial psychological evaluation of all on site contractor employees and some licensee employees. Immediately after testing, all test booklets and completed answer sheets were sent to a State of Illinois licensed psychologist located in Chicago for evaluation. Follow-up interviews, if necessary, were conducted in person between the participant and a locally-located licensed clinical psychologist. The inspector observed that test booklets and blank answer sheets were adequately controlled and protected. Interviews with cognizant licensee personnel showed that the identity of the person was confirmed before taking the test.

Proctoring and control of psychological testing at the site was conducted by two licensee organizations. The site security department conducted testing for contractors, and the Human Resource Department (HR) conducted testing for licensee personnel. The inspector determined that the procedure for the administration of psychological evaluations was adequate.

Inspector interviews of test proctors identified a difference in practices between the two organizations. Security test proctors continuously monitored testing activities, while HR personnel monitored test participants on a random basis. Licensee's procedure, Corporate Security Guideline No. 503, required proctors to remain in the same room during testing. The inspector verified that in the last 14 months approximately eight personnel, each at a separate time, were tested by the HR Department, while approximately 450-500 personnel were tested under the control of the security department. When this finding was identified by the inspector, the licensee implemented a program change requiring that all psychological testing activities be under the control of the licensee's security department to assure that proctoring procedure requirements were consistently implemented. This action adequately resolved the inspector's finding and corrected a weakness in the program that could have resulted in compromised psychological test results. The significance of this finding was lessened because of the small number of personnel tested by HR. This failure to follow the procedure constituted a violation of minor significance. This licensee-identified and corrected violation is being treated as a **Non-Cited Violation (50-254/265-96006-10)** consistent with Section VII.B.1 of the NRC Enforcement Policy.

Behavioral Observation Program

The inspector concluded that the behavioral observation aspect of the access authorization program was adequately implemented. The inspector viewed a 55-minute video tape used to provide behavior observation

training to all individuals granted unescorted access authorizations as part of the initial and annual refresher Nuclear General Employee Training. Also, four supervisors (two licensee and two contractors) and eight non-supervisors (four licensee and four contractors) were interviewed. Prior to January 1, 1996, behavioral observation training was provided only to supervisors, as required by regulatory requirements. Licensee management has since changed this practice to include all employees. This change eliminated the need to monitor personnel assigned as supervisors to assure that the required behavioral observation training was provided in a timely manner, and improved the program to detect adverse behavior. The training consisted of viewing a 55-minute videotape and passing a written test.

Denial or Revocation of Unescorted Access

The inspector verified by procedure review and interviews that the licensee has an appeal procedure available to any site employee whose employment was adversely affected when unescorted access was denied or revoked by the licensee. Inspector review identified no problems with the procedure.

Records

The inspector verified though interviews with several cognizant access control personnel and plant employees that individuals that applied for unescorted access were informed about the type of records that may be produced and retained, where such records are normally maintained, and the duration that such records are retained. Required records are maintained at the licensee's corporate headquarters.

c. Conclusions

Implementation of those parts of the "Access Authorization" rule that applied to the Quad Cities site were implemented in accordance with regulatory requirements and performance was good. An inspector finding regarding the failure to adequately proctor psychological evaluation testing in accordance with procedure guidance was adequately corrected. Management support and oversight was good as evidenced by effective program implementation activities and the expansion of behavioral observation training to all plant personnel.

S8 Miscellaneous Security and Safeguards Issues

S8.1 Access Control Deficiencies

On April 16, 1996, the licensee notified Region III that, on the same date, a contractor employee whose access to the protected area was suspended entered the protected area by "tailgating" in behind another contractor employee. The unauthorized access was immediately detected by security, and both individuals were controlled in the main access facility. The licensee initiated an investigation and determined there was no malevolent intent by the employee who "tailgated" and there was

no complicity on the part of the individual who preceded the tailgater. The licensee made a one-hour security report and planned to submit a 30-day report. A Region III security inspector will follow up on this issue **(Inspector Follow-up Item 254-265/96006-11(DRS))**.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on May 20, 1996. The licensee acknowledged the findings presented.

The licensee did not indicate that any materials examined during the inspection should be considered proprietary.

ComEd

Ed Kraft, Site Vice President
Bill Pearce, Station Manager
Nick Chrissotimos, Regulatory Assurance Supervisor
Dave Cook, Operations Manager
Frank Famulari, SQV Director
John Hutchinson, Engineering Manager
Mike Wayland, Maintenance Superintendent

X3 Management Meeting Summary

On May 15, 1996, NRC managers from headquarters and RIII offices visited the Quad Cities Station for a plant tour. NRC participants included J. Milhoan, W. Russell, R. Capra, M. Sartorius, B. Beach, B. Clayton, P. Hiland and R. Pulsifer.

INSPECTION PROCEDURES USED

IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 60710:	Refueling Activities
IP 62703:	Maintenance Observation
IP 64704:	Fire Protection Program
IP 71707:	Plant Operations
IP 73051:	Inservice Inspection - Review of Program
IP 73753:	Inservice Inspection
IP 83729:	Occupational Exposure During Extended Outages
IP 83750:	Occupational Exposure
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92902:	Followup - Engineering
IP 92903:	Followup - Maintenance
IP 93702:	Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-254/265-96006-01	NCV	failure to follow procedure for positioning reactor vessel head
50-254/265-96006-02	VIO	wrong SRM shorting links removed
50-254/265-96006-03	IFI	increase in the number of recent industrial safety incidents
50-254/265-96006-04	IFI	test director inattentiveness during modification testing
50-254/265-96006-05	IFI	spacer plates inadequately left installed in MSIV actuators
50-254/265-96006-06	IFI	high humidity in control room
50-254/265-96006-07	URI	apparent radiation protection violation by a contract worker
50-254/265-96006-08	URI	secondary containment deficiencies
50-254/265-96006-09	IFI	damaged emergency response sirens
50-254-265-96006-10	NCV	psychological testing
50-254-265-96006-11	IFI	access control deficiencies

Closed

50-254/265-94014-03	URI	loading of MCC 18-2 not ensured by design or testing
50-254/265-96002-09	URI	residual heat removal corner room steel issue
50-254/265-94026-04	URI	current CRV and SBGT system surveillance procedures appeared inadequate to meet system design requirements

LIST OF ACRONYMS USED

ACAD -	Atmospheric Containment Atmosphere Dilution
ARI -	Alternate Rod Insertion
CAM -	Containment Atmosphere Monitor
CFR -	Code of Federal Regulations
CRD -	Control Rod Drive
CRV -	Control Room Ventilation
DET -	Diagnostic Evaluation Team
DOT -	Department of Transportation
EHC -	Electro-Hydraulic Control System
ENS -	Emergency Notification System
FSAR -	Final Safety Analysis Report
GE -	General Electric
HCU -	Hydraulic Control Unit
HEPA -	High Efficiency Particulate Filter
HPCI -	High Pressure Coolant Injection
HR -	Human Resource Department
HVAC -	Heating, Ventilation, and Air Conditioning
IDNS -	Illinois Department of Nuclear Safety
IM -	Instrument Maintenance
INPO -	Institute of Nuclear Power Operations
IRSF -	Interim Radwaste Storage Facility
LCO -	Limiting Condition for Operation
LLRT -	Local Leak Rate Test
LPCI -	Low Pressure Coolant Injection Mode of RHRs
LPRM -	Local Power Range Monitor
MCC -	Motor Control Center
MSIV -	Main Steam Isolation Valve
NLO -	Non-licensed Operator
NRR -	Nuclear Regulatory Commission Office of Nuclear Reactor Regulation
ODCM -	Offsite Dose Calculational Manual
OOS -	Out of Service
PCP -	Process Control Program
PFC -	Procedure Field Change
PIF -	Problem Identification Form
QA -	Quality Assurance
RBCCW-	Reactor Building Closed Cooling Water System
RCIC -	Reactor Core Isolation Cooling
RH -	Relative Humidity
RHR -	Residual Heat Removal
RPA -	Radiological Protected Area
RPS -	Reactor Protection System
RPT -	Radiation Protection Technician
RR -	Reactor Recirculation
RWCU -	Reactor Water Clean Up
SBDG -	Standby Diesel Generator
SBGT -	Standby Gas Treatment
SRM -	Source Range Monitor
TCV -	Temperature Control Valve
TS -	Technical Specification
UFSAR-	Updated Final Safety Analysis Report
WBF -	Whole Body Frisk