U.S. NUCLEAR REGULATORY COMMISSION

REGION III

REPORT NO. 50-456/96006; 50-457/96006

FACILITY
Braidwood Nuclear Plant, Units 1 and 2

License Nos. NPF-72; NPF-77

LICENSEE
Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

DATES
February 10 through March 22, 1996

INSPECTORS
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APPROVED BY

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AREAS INSPECTED

A routine inspection of operations, engineering, maintenance, and plant support was performed. Follow-up inspection was performed for non-routine events and for certain previously identified items.

RESULTS

Assessment of Performance

The following assessments are based on activities during this report period.

OPERATIONS

- On March 8, the licensee shutdown Unit 1 following the failure of a second individual cell test for the safety-related bus 112 battery. The licensee realized that the battery could not be recovered in the two-hour technical specification allowed outage time. As a result, the licensee directly entered the technical specification action statement and commenced a Unit 1 shutdown. The inspectors concluded that the decision to directly enter the action statement was conservative. The inspectors observed portions of the shutdown and concluded the evolution was well controlled. (Section 1.1)

- On March 16, the licensee shutdown Unit 2 to perform a refueling outage. The inspectors observed portions of the shutdown and reviewed licensee records. The inspectors concluded that the evolution was well controlled. (Section 1.2)

- The inspectors identified that the 2A diesel generator exhaust muffler room door was ajar. In addition, the door latch was found broken and unable to hold the door closed, although corrective actions to assure that the door would remain closed had been taken for an event which occurred on February 15, 1995. (Section 1.3)

MAINTENANCE

- The inspectors identified that the licensee's corrective actions for a degraded emergency light was poor and resulted in the light being in a degraded condition for about 1 1/2 months after the problem was initially identified. (Section 2.1)

ENGINEERING

- The inspectors reviewed the operation of the Unit 1 and Unit 2 post-accident hydrogen recombiners used to control the buildup of hydrogen within the containment in the event of an accident. At the end of that review, the inspectors concluded that the recombiners would function properly in the event of an accident. However, weaknesses associated with material condition, procedures, and configuration control were identified. Also, the inspectors identified that although the hydrogen analyzer portion of the hydrogen recombiners had not functioned since initial plant startup, the licensee had not performed a required 10 CFR 50.59 review to evaluate this condition. (Section 3.2)

PLANT SUPPORT

- The inspectors determined that the licensee's identification and assessment of a failure of the Biometrics access control system was excellent. (Section 4.1.1)

- Security management demonstrated good team work in the implementation of the biometrics system and the installation of the new security computers. (Sections 4.1.1 and 4.1.2)

- The identification of a degraded protected area barrier resulted in a Non-Cited Violation. However, the identification of the degraded barrier demonstrated a good questioning attitude by security personnel. (Section 4.3)

- The recent on-site quality assurance security audit was effective in noting increasing equipment problems warranting additional engineering assistance. (Section 4.4)

Summary of Open Items

Violations: Identified in Sections 1.3, 1.6, and 2.1.
Unresolved Item: Identified in Section 3.2.
Inspection Follow-Up Item: Identified in Section 1.4.

Summary of Closed Items

Unresolved Items: Identified in Section 1.6.
Inspection Follow-Up Items: Identified in Sections 1.6, 2.3, and 4.4.
Licensee Event Report: Identified in Section 4.3.
Non-Cited Violation: Identified in Section 4.3.

INSPECTION DETAILS

1.0 OPERATIONS:

NRC Inspection Procedure 71707 was used in the performance of an inspection of ongoing plant operations.

1.1 Unit 1 Shutdown On March 8, the licensee entered Technical Specification (TS) limiting condition for operation (LCO) 3.8.2.1 following the failure of a second individual cell test for the safety-related bus 112 battery (Section 3.1). The licensee realized that the battery could not be recovered in the two-hour allowed outage time. As a result, the licensee directly entered the LCO action statement and commenced a Unit 1 shutdown. The inspectors concluded that the decision to directly enter the action statement was conservative. The inspectors observed portions of the shutdown and concluded the evolution was well controlled. The licensee entered Mode 5 on March 9 and remained in Mode 5 throughout the remainder of the inspection period.

1.2 Shutdown of Unit 2 for Refueling Outage The licensee began the 5th refueling outage for Unit 2 (A2R05) at approximately 1:20 a.m. on March 16 when the turbine was taken off line. An hour later, the reactor was manually scrammed from less than 1 percent power to verify proper insertion of the control rods. The inspectors observed the plant power decrease, taking the turbine off line, and the reactor trip. Overall, the activities were well coordinated and conducted by knowledgeable reactor operators, with good oversight provided by operations department management. The inspectors identified no problems during the shutdown and all control rods inserted as designed. The core included 21 assemblies with burnups greater than 42,000 megawatt days per metric ton uranium.

The A2R05 outage was scheduled for 48 days. Major work planned included a modification to remove the reactor coolant system resistance temperature detector bypass system, steam generator tube inspections, replacement of the rotating element of the 2A safety injection (SI) pump, and modifications of the core exit thermocouples and the refueling mast.

1.3 2A Diesel Generator Exhaust Muffler Room Door Ajar On March 11 the inspectors identified, during a normal building tour, that the 2A DG exhaust muffler room door was ajar. The door latch was broken and unable to hold the door closed. Diesel generator operation had been degraded in May 1994 due to diesel generator exhaust leakage around the door seals which clogged the diesel generator ventilation intake filters and resulted in a high differential pressure condition. The inspectors also noted that no action request to repair the latch had been written. The inspectors immediately notified the licensee who promptly closed the door and repaired the door latch mechanism. The inspectors also noted that personnel were required to enter this

room in accordance with step F.9-13 of 2BwOS 8.1.1.2 a-1, "Unit Two 2A Diesel Generator Operability Monthly (Staggered) and Semi-Annual (Staggered) Surveillance."

On May 15, 1994, the 1A diesel generator (DG) was shutdown after receiving a high intake filter differential pressure alarm. A licensee inspection of the muffler room revealed that the 1A diesel generator exhaust rupture disc had ruptured and the muffler relief valve had actuated. The air intake filters were clogged by the DG exhaust and muffler insulation debris which escaped from the room around the muffler room door seals. As part of the licensee's corrective actions for this event, the sealing details for the doors between the DG exhaust muffler rooms and the DG air intake plenum were modified to reduce the potential leak path for DG exhaust and muffler insulation debris.

On February 15, 1995, the inspectors discovered all four diesel generator exhaust muffler room doors blocked open although corrective actions to ensure the seal tight closure of these doors had been identified following the rupture disc failure described above. The blocking open of the doors resulted in a Notice of Violation (95006-02). In response to the violation, the licensee immediately closed the muffler room doors and placed signs on the doors to indicate the required closed position.

10 CFR 50, Appendix B, Criterion XVI, requires that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, and nonconformances are promptly identified and corrected. However, as described above, the inspectors identified the condition of the broken and unclosed 2A DG exhaust muffler room door, although corrective actions to assure that the door would remain closed had been taken for an event which occurred on February 15, 1995. The inspectors concluded that this was a violation of 10 CFR 50, Appendix B, Criterion XVI since previous corrective actions failed to prevent recurrence (96006-01).

1.4 Unit 1 Main Steam Isolation Valve Closure Problem On March 11, with Unit 1 in Mode 5, the licensee attempted to close the four main steam isolation valves (MSIVs) using the valve position control switch, but two of the valves, 1MS018B and 1MS018C, did not close. The licensee was able to close the valves with the main steam isolation switch.

Preliminary investigation by the licensee determined that instrument air to the valves had been isolated about a day before the attempt to close the valves. With the air supply isolated, air leakage from the active accumulator pilot air system in the two valves was sufficient to result in a loss of the necessary air pressure to close the valves with the individual valve control switch. The inspectors verified that the air valves were not closed until reactor coolant temperature for the unit was below 200 degrees. The inspectors concluded that for the time instrument air was isolated to the

MSIVs and with the capability to close the MSIVs with the main steam isolation switch, the event had minimal safety significance.

Further, the licensee identified that 1BwGP 100-5, "Plant Shutdown and Cooldown," did not address isolation of air to the MSIVs, although operating procedure BwOP MS-12, "MSIV Out Of Service/Return to Service," specified closing the MSIVs and then closing the instrument air isolation valves. To complete the investigation, the licensee was reviewing the two procedures and discussing the event with the responsible operating crew. The results of that review and discussion is an Inspection Follow-Up Item (96006-02).

1.5 Unit 1 Panel Inattentiveness On February 27 the inspectors observed that with Unit 1 at power the reactor operator (RO) left the "at the controls area" of the unit leaving the senior reactor operator (SRO) for the unit present "at the controls." However, the SRO was busy typing turnover notes and had his back to the unit. This condition lasted only a few moments and was allowed by BwAP 300-1, "Conduct of Operations." The inspectors concluded that although what was observed was within procedure guidelines the inattentiveness was a poor practice.

The inspectors discussed the observation with the operations manager who stated that what occurred was procedurally acceptable but not within management expectations. The operations manager stated that the expectations were that if the RO left the "at the controls" area of the unit, it would be clearly communicated to the SRO and the SRO or another RO would observe the panels in the absence of the RO. The operations manager also stated that these expectations would be re-communicated to the SROs as a group. The inspectors have not seen any further problems in this area and considered this an isolated incident.

1.6 Follow-up on Previously Opened Items A review of previously opened items was performed per NRC Inspection Procedure 92901.

(Closed) Unresolved Item 96002-03: Inoperable Hydrogen Monitors. As discussed in Inspection Report 96002 the 2A hydrogen monitor had a flow rate of 5.0 standard cubic feet per hour (scfh) and the licensee declared the monitor inoperable based on vendor information that the monitors had only been tested to 4.0 scfh. During this inspection period, the licensee performed additional calculations and concluded that the 2A hydrogen monitor was operable. The inspectors reviewed the calculations and have no further concerns about 2A hydrogen monitor high flow. However, the issue of valve manipulations within the monitor cabinets was part of a special Inspection Report (96005) and will be tracked as apparent violations 96005-04 and 96005-05.

(Closed) Unresolved Item 96002-05: Unit 2 Pressurizer Relief Tank (PRT) Level Adjustments. Licensee personnel stated that there was an undocumented investigation of unexplained input into the PRT sometime in 1994 or early 1995. The investigation ruled out leakage by several valves as the source of the input, but did not identify a possible source. After the investigation, no further actions were taken. On January 30, 1996, the inspectors noted a PRT high pressure alarm had come in on that day and no followup corrective actions had been taken by the operators. The inspectors also noted that the alarm had come in several times earlier in January and there were no records of operators taking corrective actions as required by alarm response procedure BwAR 2-12-B7, "PRT Pressure High." Through discussions with several operators, the inspectors concluded that no corrective actions were taken because the operators believed the problem had been previously investigated and that nothing would result from taking further action. After the inspectors' observation was discussed with operations management, the licensee again investigated and on February 27, identified excessive packing leakoff from a valve, 2CV8147, the charging to reactor coolant loop 2A isolation valve, as the source of the leakage. A work request was written to repair the valve during the current Unit 2 outage. The failure on January 30 to initiate corrective actions is an example of violation of 10 CFR 50, Appendix B, Criterion XVI (96006-01).

(Closed) Inspection Follow-Up Item (IFI) 96002-06: Unit 1 Overboration. As discussed in Inspection Report 96002, an excessive boron addition occurred on February 6 during an automatic makeup to the volume control tank. The excessive boron addition resulted in an unexpected drop in reactor coolant temperature of about four degrees. Another smaller overboration occurred on February 22, following troubleshooting of a suspected faulty boric acid flow controller. No further problems occurred after the February 22 event.

Contributing to the February 6 event was an operator workaround issue which required the operator to place 1CV110B, the boric acid blender to charging pumps isolation valve, in manual within 15 seconds of routinely received flow deviation alarms to prevent makeup isolation. The failure of the boric acid controller was an intermittent problem. The licensee has monitored the boric acid controllers and made minor gain adjustments and has not experienced any additional problems. The licensee is also evaluating a modification to use a different type of controller with resolution expected by June 1996. Since the event, all operating crews have been trained on the problem concerning the boric acid flow controller. In addition, a similar failure of the boric acid flow controller was included in a recent simulator scenario. The inspectors observed this scenario and concluded that the prompt inclusion of the failure in the training was a good effort by the licensee.

(Closed) Inspection Follow-Up Item 95017-05: Trips of Electronic Circuit Breaker on the 2D Steam Generator Power Operated Relief Valve (PORV). The licensee's investigation of a series of trips of the circuit breaker determined that a pressure switch, used for starting and stopping the pump for the closed stroke of the PORV, was faulty. Frequent cycling of the switch caused overheating of an output transistor, which resulted in the circuit breaker opening. The switch was replaced and no further problems occurred. The licensee initiated an engineering evaluation to determine whether control room indication of the trip status of the circuit breaker was necessary. Based on discussions with licensee representatives, the inspectors concluded that the licensee's actions to correct the cause of the trips were adequate.

(Closed) Inspection Follow-Up Item 95015-06: Diesel Generator (DG) Governor Oil Fill. As discussed in Inspection Report 95015, the licensee identified that an oil hole on the electro-hydraulic governor on the 1B diesel generator had not been drilled out by the manufacturer. Subsequently, governors on the other three DGs were inspected by the licensee. No similar problems were identified. Based on observations of troubleshooting activities of mechanical maintenance and system engineering personnel, the inspectors concluded that the licensee's actions in identifying and resolving the problem with the fill hole were good. In response to the problem, the manufacturer reviewed its records to determine if other defective governors had been manufactured. Unable to rule out that possibility, the manufacturer subsequently informed the NRC in a letter dated November 28, 1995, in accordance with the requirements of 10 CFR 21, of the potential generic problem.

2.0 MAINTENANCE

NRC Inspection Procedures 62703 and 61726 were used to perform an inspection of maintenance and testing activities.

2.1 Emergency Light Deficiency On February 7, 1996, during a routine tour of the 1B centrifugal charging (CV) pump room, the inspectors observed the emergency light 1-121 fast charge light illuminated and battery electrolyte level well below the allowable range. A deficiency tag was observed hanging from the light which indicated that an action request (AR) has been written on January 4, 1996, to identify that the fast charge light was continuously energized.

The emergency lights provide lighting in the event of a loss of normal plant lighting and are required by 10 CFR 50, Appendix R. Also, electrolyte level at a low level could lead to a battery explosion under certain circumstances.

Subsequently, the fire protection system engineer confirmed the inspectors' findings and wrote an AR and completed a problem identification form (PIF) for the emergency light. From a review of the AR on the light, the system engineer identified that an AR was worked by minor maintenance on January 11, 1996 and

another AR had been written on January 29, 1996. Both ARs indicated the correct light number, but an incorrect location. As a result, it appeared that maintenance workers closed out both ARs without performing any work.

On February 9, maintenance placed a fully charged battery in the light. Following that work, the inspectors toured the area and noted that the fast charge light was illuminated and the electrolyte level in the battery was normal. On February 13, the inspectors again noted the fast charge light was illuminated and contacted the system engineer. Another AR and PIF were generated. On February 20, the emergency light battery and a circuit board in the charging circuit were replaced. The old circuit board was defective and caused the fast charge circuit to be used continuously. This had led to overcharging the battery and the low electrolyte level found on February 7.

The inspectors concluded that the licensee's corrective actions for this event were neither timely nor effective. About 1 1/2 months, and 4 ARs, and 2 PIFs were required to restore the emergency light.

10 CFR 50, Appendix B, Criterion XVI requires, in part, that conditions adverse to quality, such as malfunctions, deficiencies, defective material and equipment, and nonconformances are promptly identified and corrected. Failure to take prompt corrective actions to repair emergency light 1-121 as described above is an example of a violation (96006-01).

2.2 Online Maintenance of the 2B Safety Injection Pump During the week of March 3-8, 1996, the licensee conducted online maintenance of the 2B Safety Injection (SI) pump. The bulk of the maintenance involved the replacement of the pump's rotating element. On March 5, the inspectors observed about 1-2 gallons per minute of water streaming from a flow orifice flange on the discharge line of the pump and questioned the licensee as to the source of the leakage. The subsequent licensee investigation determined the water was coming from the refueling water storage tank. Because the flange was not included within the out-of-service boundary for the 2B pump work, the operability of the 2A pump was in question. This problem is the subject of special Inspection Report 96005. The leaking flange was repaired and subsequent observations by the inspectors of pump reassembly and post maintenance testing identified no problems; however, because of a minor leak identified by the licensee during the testing, the inboard seal will be reworked during the current Unit 2 refueling outage.

2.3 Follow-up on Previously Opened Items A review of previously opened items was performed per NRC Inspection Procedure 92902.

(Closed) Inspection Follow-Up Item 96002-08: 1B Centrifugal Charging Pump Maintenance. On January 11, during performance of a 1B centrifugal charging (CV) pump surveillance, oil filter differential pressure increased to an abnormal value and the pump was secured. The licensee inspected the oil reservoir and a 2-inch length of tygon hose as well as a small quantity of paint chips, some dirt, and metal shavings were discovered in the bottom of the reservoir.

The licensee was unable to identify the source of the foreign material. At the end of the inspection period, the licensee planned to inspect the 2A and 2B CV pump reservoirs to determine if foreign materials were present. The inspectors concluded that the events as described above was an additional example of a foreign material exclusion problem which was discussed in Inspection Report 95015 and for which a Notice of Violation was issued (95015-03).

(Closed) Inspection Follow-Up Item 96002-09: 1B Condensate Booster (CB) Pump Failure. On January 26, a field supervisor noted no oil return flow on the 1B CB pump inboard bearing. This pump had recently been rebuilt as part of a licensee effort to improve the material condition of these pumps. Shortly afterward, the inboard bearing temperature increased rapidly and the 1B CB pump was secured.

Subsequently, the inspectors learned through interviews that mechanical maintenance department personnel disassembled the pump bearing and identified that the babbitt material on the internal bore of the bearing had been significantly damaged and that the pump shaft around the bearing had a groove in it. In addition, mechanical maintenance personnel opened the lube oil sump and identified babbitt and other debris.

During this inspection period, the inspectors learned through interviews that the licensee identified small aluminum oxide particles embedded in the pump outboard bearing which could account for the damage to the inboard bearing since both bearings shared a common lube oil system. The licensee was unable to identify the source of the foreign material. The inspectors concluded that the events as described above were an additional example of a foreign material exclusion problem which was discussed in Inspection Report 95015 and for which a Notice of Violation was issued (95015-03).

3.0 ENGINEERING

NRC Inspection Procedure 37551 was used to perform an onsite inspection of the engineering function.

3.1 Unit 1 Battery 112 Operability As discussed in Inspection Report 95015, the licensee had poor results from a discharge test of the safety-related bus 112 DC (direct current) battery. Subsequently, the licensee committed to conduct additional testing.

On March 6 and March 8, 1996, two individual cells were tested as part of that commitment. Both cells failed and the licensee declared the battery inoperable. Unit 1 was subsequently shutdown while an investigation was conducted by the licensee to determine the cause of the failures. The results of that investigation will be discussed in a future inspection report.

3.2 Hydrogen Recombiner Walkdown The inspectors reviewed the operation and maintenance of the Unit 1 and Unit 2 post-accident hydrogen recombiners used to control the buildup of hydrogen within the containment in the event of an accident. At the end of that review, the inspectors concluded that the recombiners would function properly in the event of an accident. However, the following issues were identified:

System Walkdown Observations During the walkdown, the inspectors noted the following deficiencies:

- **Solenoid Valve Leakage** During maintenance observations, the inspectors noted that the OB hydrogen analyzer span gas solenoid valves leaked-by excessively. However, since the licensee has not been able to calibrate the analyzer, even with a dedicated span gas cylinder, the inspectors concluded that this was not a significant problem. Action requests to repair these valves had not been generated. After the inspectors identified this condition, the licensee planned to repair these valves as part of a work package to repair the hydrogen recombiner hydrogen analyzers which have not functioned properly since initial plant startup.

- **Valve Position Indication Weaknesses** Numerous system valves did not have open and closed position labels affixed to the valve body. The inspectors concluded that the valve position indicating pointers could not be fully utilized by the operators as an aid to indicate when valves were fully open or closed.

- **Configuration Control Problem** During a walkdown of the OA hydrogen recombiner, the inspectors identified an instrument power supply breaker in an incorrect position (closed). The licensee subsequently opened the breaker and documented this event in a PIF. As described in previous inspection reports, configuration control problems have been identified by the licensee and the inspectors as an issue and are the subject of special Inspection Report 96005.

- **Component Identification Weaknesses** The inspector identified two valve identification weaknesses:

    - Two hydrogen analyzer calibration gas isolation valves had incorrect unit designations.

- The hydrogen analyzer selector switch was not labeled consistent with procedural references.

Hydrogen Analyzer Longstanding Material Condition Problem During the inspection, licensee personnel stated that the nonsafety-related hydrogen analyzer portion of the hydrogen recombiners had not functioned properly since plant startup. The inspectors noted that although the hydrogen analyzers were not required to support the operation of the recombiners, they could serve as a non-seismic backup to the hydrogen monitors to provide important containment hydrogen concentration information in the event of an accident. In addition, the analyzers can be used to monitor hydrogen concentration at the exit of the recombiner, and can therefore provide an indication of recombiner effectiveness.

The licensee has recently begun to restore this equipment to a functional state. The inspectors concluded that problems with the hydrogen analyzer portion of the hydrogen recombiner were examples of longstanding material condition problems.

The inspectors reviewed the Braidwood UFSAR and identified that Section 6.2.5.1 stated that the analyzer portion of the hydrogen recombiners were available for monitoring hydrogen concentration in containment. However, as discussed above, licensee personnel stated that the hydrogen analyzer portion of the hydrogen recombiners had not been functional since initial plant startup. The inspectors also identified that it appeared that a review required by 10 CFR 50.59 to not use the hydrogen analyzers had never been performed. This is an Unresolved Item (96006-03) pending further NRC review.

Procedure Review The inspectors reviewed procedures BwOG OP-9, "Shutdown of the Hydrogen Recombiners," BwOG OP-10, "Startup of a Hydrogen Recombiner," BwAR 0-38-E14, "Hydrogen Recombiner Trouble," and identified the following weakness:

- The hydrogen recombiner startup procedure directed that in the event of a high containment hydrogen concentration, operators were to open a nitrogen supply throttle valve to dilute flow into the recombiner. However, the procedure did not specify any hydrogen concentration limits into the recombiner. The inspectors concluded that operators could reduce the recombiner efficiency since operators could over-dilute hydrogen flow into the recombiner and therefore unnecessarily limit the recombiner's effectiveness.

Surveillance Review The inspectors reviewed the following most recently completed surveillance procedures and concluded that the surveillances results satisfied the technical specification requirements.

BwIS 6.4.2-200	Surveillance Calibration of Hydrogen Recombiner Inlet Flow Loop
BwIS 6.4.2-201	Surveillance Calibration of Hydrogen Recombiner Temperature Switch
BwIS 6.4.2-202	Surveillance Calibration of Hydrogen Recombiner Temperature Loop
BwIS 6.4.2-203	Surveillance Calibration of Hydrogen Recombiner Temperature Indicating Control Loop
BwHS 4009-010	Thermal Hydrogen Recombiner 18 Month Surveillance
BwOS 6.4.2.A-1	Hydrogen Recombiner 0A Semi-Annual Surveillance
BwOS 6.4.2.B-1	Hydrogen Recombiner 0B Semi-Annual Surveillance

No deficiencies were noted.

4.0 PLANT SUPPORT

NRC Inspection Procedures 71750 and 83750 were used to perform an inspection of Plant Support Activities.

4.1 Security and Safeguards The inspectors reviewed the licensee's physical security program to assess the licensee's capability to protect the facility against radiological sabotage and to determine if safeguards program commitments and regulatory requirements were met. The review included audits, corrective actions and management support; effectiveness of management controls; security program plans; protected area detection equipment; and alarm stations and communications. No violations were identified.

4.1.1 Effectiveness of Management Controls: Biometrics A strength was identified in the licensee's identification and assessment of an apparent isolated failure of the Biometrics access control system implemented in August 1995.

On December 21, 1995, a licensee employee inserted his keycard into a security computer card reader, but was not prompted to insert his hand by the Biometrics reader and inappropriately received a turnstile release signal from the computer which allowed access through the turnstile. The employee immediately notified security officers in the area.

The licensee reviewed logs for both the Biometrics and security computer and verified that the employee was logged into the plant on the security computer. However, there was no record of a transaction for him in the Biometrics system. On January 30, another similar event took place.

Subsequently, the licensee immediately removed the affected Braidwood Biometrics reader from service and contacted the vendor who indicated that they would conduct a full review of the software being used. Subsequently, the licensee developed a "test bed" and after several thousand insertions, a card misread was reproduced. The vendor then requested that the licensee send them the Biometrics reader, test bed, several key cards, and documentation pertaining to the events, for a more detailed review. Licensee discussions with the vendor disclosed that the software, contrary to initial specifications, was not performing parity checks on the input side of the Biometric reader. This directly contributed to the problem. The licensee requested that a parity checking feature be added to the software. Once these changes are made, the licensee intended to ensure that the software met an acceptance criterion defined as greater that 10,000 card reads without experiencing any misreads.

The inspector concluded that the licensee had done an excellent job in identifying the problem and pursuing resolution. The failures of the Biometrics systems did not represent a vulnerability that would require compensatory measures. The identified failures were extremely few in number compared to the hundreds of thousands of reader entries made since the system was placed in operation in August 1995. The card misreads were unpredictable, and could only be reproduced with great difficulty.

4.1.2 Security Computer Replacement Program: Alarm Station Operator Training The basic design of a new security computer system was developed through several meetings with representatives from the licensee's security staff and Burns security from all six Commonwealth Edison nuclear stations. The revised design incorporated the best features of current systems in addition to many new functions.

In December 1995, a simulator containing the newly created operator interface was delivered to Braidwood Station. All of the console operators were exposed to the simulator training and new ideas were obtained, evaluated, and where deemed appropriate, incorporated into the design. The Burns computer training team did an excellent job in developing a training program for operators. Console operators went through this training during the inspection period and provided positive feedback to the inspectors.

The electrical maintenance department expected to complete the power portion of the computer replacement project February 28, 1996 and begin installation. The licensee will be running on the two new security computers as well as having two backup computers throughout refueling outage A2RO6. After the outage (late May 1996), the replacement efforts will continue with the installation of revised multiplexer hardware that will complement the new computers. The existing backup computer will then be removed.

The inspector concluded that the computer replacement project received excellent management support and that the training program for console operators was excellent.

4.3 Follow-Up on Non-Routine Events NRC Inspection Procedures 90712 and 92700 were used to perform a review of written reports on non-routine events.

(Closed) Licensee Event Report 456/96-S01-00: Failed Compensatory Measures for Lake Screen House Security Barrier Degradation. The distance below the screen house gate slightly exceeded the 96 square inch criteria identified in NUREG 0908 as a result of maintenance personnel adjusting the height of the gate.

As part of the licensee's corrective actions for this event, lessons learned information was provided to security supervisors and security force personnel were advised in writing of the 96 square inch criteria. The event had minimal safety significance. The licensee's approach in analyzing the event through a root cause investigation and correcting the problem was thorough.

Section 5.2 of the licensee's approved security plan states that "he protected area physical barriers are constructed such that the integrity of the barriers are not reduced by access points. The inspectors determined that in this case the barrier integrity was reduced; however, this licensee-identified and corrected violation is a Non-Cited Violation (96003-04), consistent with Section VII of the NRC Enforcement Policy.

4.4 Follow-Up on Previously Opened Items A review of previously opened items was performed per NRC Inspection Procedure 92901.

(Open) Inspection Follow-Up Item 95013-05: Negative Trend in Door and Perimeter Hardware Failures. During the inspection period, the Security Administrator stated that the perimeter and door failures were attributable to several problem zones that have been repaired; however, a new issue identified by the licensee was an increase in the number of perimeter zone junction box solid tamper alarms that will not reset potentially due to moisture entering the boxes.

(Open) Inspection Follow-Up Item 95013-06: Contingency Response Weakness and Inability to Respond to an External Threat. As discussed in Inspection Report 95013, a critical equipment analysis and the development of a defensive strategy for deployment of response assets as part of the contingency planning for responding to an external threat had not been conducted. The licensee continued to believe that they can reach their goal of validating a response strategy and completing security force training in that response strategy by the end of 1996. The inspectors concluded the licensee appeared to be making good progress in resolving the contingency planning weakness.

5.0 REVIEW OF UFSAR COMMITMENTS

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 descriptions. During the inspection period, the inspectors reviewed the applicable sections of the UFSAR that related to the inspection areas discussed in this report. The following inconsistencies were noted between the wording of the UFSAR and the plant practices, procedures and/or parameters observed by the inspectors.

- UFSAR Section 6.2.5, "Combustible Gas Control in Containment," states, in part, that, "The capability to monitor combustible gas concentration within the containment has been provided. Two systems for monitoring hydrogen concentration in containment are available. One is a qualified system capable of measuring the hydrogen concentrations up to 30 percent (hydrogen monitoring system). The second system is a nonqualified system which is part of the hydrogen recombiners and is capable of measuring hydrogen concentrations up to 5 percent (hydrogen recombiner analyzer)."

  In practice, however, licensee personnel stated that the hydrogen analyzer portion of the hydrogen recombiner system has never been functional at Braidwood. Therefore, this system was not capable of monitoring containment hydrogen concentration as stated in the UFSAR.

- UFSAR Section 6.2.5.2.1.4, "Alarms and Indications," for the hydrogen recombiner local alarms failed to include a "Containment Hydrogen Concentration High," alarm although the annunciator existed in the field.

5.0 PERSONS CONTACTED AND MANAGEMENT MEETINGS

Senior Management Visit On March 6 the Director, Division of Reactor Projects for Regions III and IV, Mr. J. Roe and a member of his staff toured the plant and conducted interviews of ComEd personnel.

Exit Meeting The inspectors 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 March 22, 1996, the inspectors met with licensee representatives (denoted by *) and summarized the scope and findings of the inspection activities. The licensee did not identify any of the documents or processes reviewed by the inspectors as proprietary.

*K. Kaup, Site Vice President
*T. Tulon, Station Manager
*A. Haeger, Radiation/Chemistry Director
W. McCue, Support Services Director
R. Flessner, Site Quality Verification Director
R. Byers, Maintenance Superintendent
D. Skoza, Engineering Superintendent
D. Miller, Work Control Superintendent
*T. Simpkin, Regulatory Assurance Supervisor
*H. Cybul, System Engineer Supervisor
*J. Meister, Engineering Manager
*D. Cooper, Operations Manager
*J. Lewand, Regulatory Assurance - NRC Coordinator
*M. Pavey, Nuclear Licensing
*H. Pontius, Nuclear Licensing

6.0 VIOLATIONS FOR WHICH A "NOTICE OF VIOLATION" WILL NOT BE ISSUED

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee's initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of the NRC Enforcement Policy. These tests are: 1) the violation was identified by the licensee; 2) the violation would be categorized as Severity Level IV; 3) the violation will be corrected, including measures to prevent recurrence, within a reasonable time period; and 4) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation. A violation of regulatory requirements identified during this inspection for which a Notice of Violation will not be issued is discussed in Section 4.3.

7.0 DEFINITIONS

7.1 Inspection Follow-Up Items Inspection Follow-Up Items are matters which have been discussed with the licensee, which will be reviewed by the inspector, and which involve some action on the part of the NRC or licensee or both. An Inspection Follow-Up Item disclosed during the inspection is discussed in Section 1.4.

7.2 Unresolved Items Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An Unresolved Item disclosed during the inspection is discussed in Section 3.2.