

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-454/94004(DRP); 50-455/94004(DRP)

Docket Nos. 50-454; 50-455

License Nos. NPF-37; NPF-66

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

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: January 11 through February 28, 1994

Inspectors: H. Peterson  
C. Brown  
M. Bailey (Medical Records Review January 7-21)  
D. Schrum (Fire Protection Assistance February 16-17)

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Reactor Projects Section 1A

3-8-94  
Date

Inspection Summary

Inspection from January 11 through February 28, 1994, (Report Nos. 50-454/94004(DRP); 50-455/94004(DRP)).

Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of previous inspection findings, operational safety verification, engineered safety feature system walkdown, housekeeping and plant cleanliness, radiological controls, security, fire protection, safety assessment/quality verification, maintenance and surveillance activities, tagouts and work control, cold weather preparations, engineering and technical support, emergency preparedness, and report reviews.

Results: Of the fourteen areas inspected, two violations, one unresolved item, and two inspector followup items were identified. The violations pertained to failure to follow NRC requirements and station procedures (paragraphs 3a and 3f). The unresolved item pertained to engineering and design concerns (paragraph 7). The inspector followup items pertained to self assessment and work control concerns (paragraphs 4b and 5c). A summary of performance during this inspection period is provided in Paragraph 1.

## DETAILS

### 1. Management Interview (71707)

The inspectors met with the licensee representatives denoted in paragraph 12, both during the inspection period and at the conclusion of the inspection on March 1, 1994. The inspectors summarized the scope and results of the inspection and discussed the likely content of the report as described in these Details. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.

#### Plant Operations

Overall, performance in this area continues to be good. During this inspection period, several operational issues challenged the licensee, including the continued problems with the process and prime computers. The licensee's responses to these and other issues were good.

Two operational concerns were identified during this period. One issue pertained to problems associated with the two year interval for the licensed operator medical examinations (paragraph 3a). The second issue pertained to the lack of aggressive controls by the station's fire protection program (paragraph 3f). Both of these issues involved violations of NRC requirements.

#### Safety Assessment/Quality Verification

Performance in this area remains good. Station management continues to give high regard and attention to the station's Integrated Reporting Process, as evident by the extensive improvement program. On the other hand, the inspector had concerns about effective Problem Identification Form (PIF) screening (paragraph 4b).

#### Maintenance and Surveillance

Performance in this area was satisfactory; however, a series of tagout and work control problems, both recent and historical, indicate a need for continued attention (paragraph 5c).

#### Engineering and Technical Support

Performance in this area was considered to be good. The licensee identified two engineering concerns; specifically, the problems associated with the cardox and the essential service water (SX) systems. With respect to the SX system, the licensee faced an engineering/modification challenge, including an operability issue. The inspectors are also monitoring the engineering department's progress on the cardox system as an unresolved item (paragraph 7).

2. Action on Previous Inspection Findings (92701 & 92702)

- a. (Closed) Violation 454/455-92007-02(DRS): A violation was issued for inadequate fire watch coverage. The fire watch was located beyond a reasonable distance to provide adequate coverage for a cutting/welding operation. The placement of the fire watch had been determined by the Fire Marshal's office after conferring with the supervisor in charge. During this welding operation, the fire watch person failed to stay in the area where adequate coverage could be provided. The licensee's corrective action was to immediately stop the cutting operation, until another fire watch was posted. The Fire Marshal's office issued a memo to all department heads on the requirement to ensure that fire watches are properly positioned to cover assigned jobs. Also, the training module was enhanced by incorporating additional words to clarify the fire watch responsibilities.

During the past two years, no additional problems were noted for fire watches not being in a work area to provide adequate fire watch coverage. A review of field monitoring reports (FMRs) and audits indicated that Site Quality Verification (SQV) had not identified a repeat of the problem. During this inspection, it was observed that a fire watch who was providing coverage for a welding activity was attentive to his duties. An extinguisher was stationed nearby by attachment to the welding cart. Following the review of the licensee's corrective actions, this violation is considered closed.

- b. (Closed) Open Item 454/455-92007-01(DRS): Hydrogen Tank Farm Piping Cathodic Protection. The plant receives hydrogen from the hydrogen tank farm through Class D carbon steel underground piping with a protective coating for corrosive resistance. The inspector's concern was that faults and discontinuities in the coating could develop and lead to corrosion of the pipe. The subsequent hydrogen release would result in a fire and explosion hazard. The licensee agreed to consider whether cathodic protection was needed for the underground hydrogen tank piping.

Byron has a high-performance replaceable deep anode cathodic protection system which provides corrosion protection for buried piping throughout the area of the plant. The licensee performed an engineering evaluation on the hydrogen piping to determine if the cathodic protection provided by the site cathodic protection system was adequate. The test results determined that the current level of protection for the hydrogen piping was unacceptable; it was at  $-.385$  volts versus a required acceptable value of  $-.85$  volts.

Prior to this inspection, the licensee had attempted to isolate the piping and provide a direct connection to a rectifier for cathodic voltage protection. However, an undetermined ground in the piping had prevented the licensee from obtaining an acceptable voltage value. The licensee plans to contract the work to identify the ground in the current piping.

The corrective actions for this project are slow, but the actual safety implications of this pipe rusting through are minimal. The majority of these pipes are underground and outside the safety-related areas. The open item states that the licensee agreed to consider whether cathodic protection was required. The licensee has identified that additional cathodic protection is necessary and adequate actions are being taken; therefore, this item is considered closed.

### 3. Plant Operations

Both units operated at power levels up to 100% in the load following mode throughout the report period.

#### a. Operational Safety Verification (71707, 93702)

The inspectors verified that the facility was being operated adequately in conformance with applicable licenses and regulatory requirements. Additionally, the licensee's management control system continues to effectively carry out its responsibilities for safe operation. During this inspection period, the following items, relating to operational events and issues, were evaluated.

#### CONTAINMENT DRAIN LEAK DETECTION 1RF008

On February 13, 1994, the control room experienced an alarm on Unit 1 "Containment Drain Leak Detect Flow High" annunciator for the floor drain recorder 1RF008. The equipment, 1RF008, measures the floor drain leak rate by utilizing a sump and weir arrangement. The drain sump fills up and the flow through the weir gives representative indications of leakage within the containment. The initial flow rate on 1RF008 had indicated 0.3 gpm, but the flow rate after the onset of the alarm increased to 0.9 gpm, which was above the reset value and below the alarm set point of 1.0 gpm. This caused the annunciator to remain lit.

Initially, the operators appeared somewhat passive about receiving the locked-in alarm. The licensee noted that this condition had occurred before, and it was assumed that some debris must have clogged the weir causing the increased flow rate indication. No problem identification form (PIF) was found to be written. The inspector expressed concern about reliable leak indication and subsequent operability of this technical specification (TS) equipment used for containment leakage detection per TS 3.4.6.1.b. The inspector questioned operations and system engineering on the

consequences and what mitigating actions were required, and also why a PIF was not written. Subsequently, on February 15, a PIF was written and reviewed for tracking purposes. The licensee performed a set point change evaluation and also incorporated a temporary procedure change, to clear the alarm and prevent masking out other leakage alarms. This resulted in adjusting the alarm set point relative to the present indication to adequately give a margin (0.6 to 0.7 gpm) prior to exceeding a 1.0 gpm unidentified containment leakage. The inspector determined that adequate actions associated with the annunciator response procedure were performed, including verifying reactor coolant system and unidentified leak calculations and requesting chemistry to sample the floor sump.

At the end of this inspection period, the licensee made a containment entry outside the missile barrier to check the transmitter. The actual weir and sump equipment are located inside the missile barrier, making it very difficult to repair unless the reactor is shut down. No improvements were made. Subsequently, another set point change was required due to additional fluctuation in the leakage indication. The licensee has determined to clean out and further investigate IRF008 on the next available reactor shutdown. The inspectors will continue to monitor the licensee's corrective action.

#### PROCESS COMPUTER

During this inspection period, the inspector attended a licensee presentation on the status of the process computer upgrade and replacement project. The four phase development continues to progress adequately, with the phase 2 portion of the Unit 1 computer scheduled to be performed during the Fall 1994 refueling outage. During this presentation, the licensee also demonstrated the capabilities of the new process computer. While the computer replacement project remains uncompleted, the licensee continues to experience computer failures.

During this inspection period, four failures occurred requiring NRC ENS notifications: January 21, two on January 23, and February 8, 1994. The majority of these conditions were initiated subsequent to routine maintenance, when the system failed to restart. The inspectors brought out questions associated with the adequacy of performing this routine maintenance. The activities performed by the computer personnel appeared to be satisfactory, within the level of understanding by the inspectors.

These periodic failures of the process and prime computers are a disruption to shift personnel; however, the computer failure itself does not pose a major safety concern. The operators do not lose the actual safety system control panel indications and they have contingency procedures to manually calculate reactor thermal parameters. The licensee has applied a conservative

interpretation of 10 CFR 50.72.(b).(1).(v), requirements associated with "major loss of emergency assessment capabilities," by stipulating that, if the computer system associated with emergency assessment is determined to be inoperable for greater than two hours, with the exception of routine maintenance and testing, then the NRC 1 hour non-emergency notification is required. The inspectors will continue to monitor the licensee's progress.

#### LICENSED OPERATOR MEDICAL EXAMINATIONS

On December 17, 1993, the NRC regional staff requested medical examination records for all Byron licensed operators. On January 7, 1994, the licensee provided the requested information in appropriate detail.

Pursuant to 10 CFR 55.21 and 55.53(i), licensed operators are required to have a medical examination every two years during the period of their license. The licensee has the responsibility to oversee these medical examinations to ensure that all licensed operators are medically fit in accordance with 10 CFR 55.53(a)(1), to maintain records of these medical examinations in accordance with 10 CFR 55.27 for the period of the license, and to notify the NRC in accordance with 10 CFR 55.25 of any changes in the operator's medical status that could affect their ability to perform licensed duties. Furthermore, in accordance with 10 CFR 50.54(i), the licensee may not permit the performance of licensed duties by anyone who may not be licensed under the provisions of 10 CFR Part 55.

Following the review of medical examination dates, it was determined that 17 of 99 licensed operators at Byron did not have a medical examination within the required period of "every two years." Seven of these operators exceeded the two year requirement by as much as 102 to 259 days. Also, five of these operators conducted licensed duties, requiring manipulation of reactor controls, during this period. The failure of licensed operators to obtain a medical examination every two years and the licensee's actions in allowing the subject operators to continue licensed duties are considered a violation of 10 CFR Parts 55.21 and 50.54(i), (50-454/455-94004-01(DRP)).

The licensee's management discussed these findings with the NRC regional staff on January 24, 1994. The licensee questioned if this issue came under the condition for non-cited violations. Due to apparent misinterpretation of 10 CFR Part 55, the licensee initially established an interval of two years (with an allowed grace period) between medical examinations, starting from the initial licensing date versus the medical exam date. Following the issuance of a similar violation in October of 1993 to the Dresden Station, the licensee indicated that a review of the medical examination program was initiated. The licensee stated

that a new procedure was implemented in November of 1993 to correct this deficiency. However, the procedural changes were not considered sufficient to ensure licensed operators do not exceed the two year requirement.

The inspector concluded that prior notification of problems with licensed operator medical examinations was provided in Information Notice (IN) 91-08, "Medical Examinations for Licensed Operators", issued February 5, 1991. IN 91-08 described problems identified by the NRC in the administration and documentation of medical examinations for licensed operators. It specifically identified cases where licensed operators did not receive medical examinations at two year intervals. Therefore, it was concluded that the licensee had adequate opportunity to identify and satisfactorily correct the discrepancies in its own program much earlier. Consequently, the criteria for Section VII.B of the Enforcement Policy (non-cited violations) were not satisfied.

b. Engineered Safety Feature (ESF) Systems (71710)

During this inspection period, the inspectors selected accessible portions of several ESF systems to verify status. Consideration was given to the plant mode, applicable Technical Specifications, Limiting Conditions for Operation Action Requirements (LCOARs), and other applicable requirements.

Various observations, where applicable, were made of: hangers and supports; housekeeping; weather freeze protection, if required, was installed and operational; valve position and conditions; potential ignition sources; major component labeling, lubrication, cooling, etc.; whether instrumentation was properly installed and functioning and significant process parameter values were consistent with expected values; whether instrumentation was calibrated; whether necessary support systems were operational; and whether locally and remotely indicated breaker and valve positions agreed.

During the inspection, the accessible portions of the following ESF systems were walked down:

- Unit 1 Train A Residual Heat Removal
- Unit 1 Train A Safety Injection
- Unit 2 Train B Chemical and Volume Control
- Portions of Unit 1 and 2 Trains A and B Essential Service Water

No major discrepancies were identified. Detailed inspections of major system valves were performed. All valves were found to be adequately tagged for proper valve identification and correctly indicated as emergency operating procedure (EOP) equipment. Material condition of the pipes in the heat exchanger room was satisfactory, although some surface rust was evident on the

component cooling system lines. No visible leakage was evident from any pipe or connection. Representative engineering drawings were obtained to verify support and hanger configuration. No discrepancies, including obvious misalignment or overloading, were found. General material condition throughout the systems was identified to be satisfactory; however, pump seal leakage and some valve stem leakage continue to pervade the systems.

c. Housekeeping and Plant Cleanliness

The inspectors monitored the status of housekeeping and plant cleanliness for fire protection and protection of safety-related equipment from intrusion of foreign material. The licensee continues its clean up and painting program throughout the plant. In general, housekeeping and plant cleanliness continues to improve; however, there are still areas, such as the residual heat removal pump, heat exchanger and containment spray pump rooms, that are targeted for more cosmetic improvements.

d. Radiological Controls

The inspectors verified that personnel were following health, physics procedures for dosimetry, protective clothing, frisking, posting, etc., and randomly examined radiation protection instrumentation for use, operability, and calibration.

e. Security

Each week during routine activities or tours, the inspectors monitored the licensee's security program to ensure that observed actions were being implemented according to the approved security plan. The inspectors noted that persons within the protected area displayed proper photo-identification badges and those individuals requiring escorts were properly escorted. The inspectors also verified that checked vital areas were locked and alarmed. During this inspection period, a security and safeguards regional specialist conducted a routine inspection. No major findings were identified. Details of the inspection are found in inspection report 50-454/455-94005 (DRSS).

f. Fire Protection

GENERAL

During the inspection period, the inspectors toured areas of the auxiliary building, the turbine building, and the circulating water pumphouse. During these tours, control of combustibles, fire doors, hose stations, detection equipment, fire pumps, extinguishers, sprinkler systems, emergency lights, and also general housekeeping were inspected for adequacy.



The material condition of the fire suppression and detection equipment was satisfactory, except for fire main valve problems. The fire marshal considered that silting from river water in the fire main system was the contributing cause for corrosion of valves making them difficult to operate. The diesel and electric fire pumps appeared to be in good condition during the walkdown. Fire brigade equipment was in good condition and was stored in locked cages in convenient locations in the plant. Most fire hoses in the plant had been replaced during the past year. The fire marshal stated that the remainder of the fire hoses will be replaced prior to their required hydro surveillance date.

### IMPAIRMENTS

The number of impaired doors in the plant continues to be a concern. In addition, there was no detailed listing of impairments. Based on a review of individual impairments the inspector concluded that the plant had not been proactive in getting impairments closed. The plant had more than 200 impairments on fire protection equipment (some dated back to 1990 and 1991). During the walkdown, it was noted some doors in the plant did not close and latch, and few doors were found open without impairments. One open fire door had caught on a bolt projecting out of the floor and the adjoining door was not latched. Continuous roving fire watches were used for compensatory measures for these numerous impairments. The plant appears to take too much reliance on the roving fire watch as a compensatory measure, rather than correcting the impairments.

With respect to fire protection, the cleanliness and housekeeping in the plant was considered good, except for some storage cages which contained considerable combustible materials. The fire marshal stated that the materials were no longer tracked as transient combustibles, but were included as part of the fixed fire load for that area. This approach is acceptable.

### COMBUSTIBLES

During a plant walkdown with the fire marshal, the inspector noticed a substantial amount of used oil in an unlocked storage cage in the auxiliary building. The oil was in 7 uncovered 5 gallon cans, which were being temporarily stored following the change out of the 1A charging pump motor oil. The fire marshal and the assistant fire marshal who were on the tour, walked past the area without remarking on the condition.

Procedure BAP 1100-9, "Control, Use, and Storage of Flammable and Combustible Liquids and Aerosols," Revision 4, provides instructions for the use, control and storage of flammable/combustible liquids. The procedure states that all flammable and combustible liquid containers transported into plant areas, which will be left unattended, shall have prior

authorization by the Station Fire Marshal/designee. Authorization shall be accomplished by completing a Transient Fire Load Permit BAP 1100-T27, and submitting to the Station Fire Marshal/designee for approval.

Technical Specification 6.8.1 requires adherence to fire protection program implementing procedures. The identified condition, involving approximately 30 gallons of used oil being left unattended in the auxiliary building without a transient combustible authorization permit, is considered a violation (50-454/455-94004-02(DRP)).

A similar problem had been identified two years earlier by Site Quality Verification (SQV), when approximately 40 gallons of oil was left unattended. Other examples of flammable combustibles not being properly controlled in the plant had also been identified by SQV during the past two years. The fire marshal stated that the fire watches had also identified examples of flammable combustibles being found unattended in the plant. However, these findings were not being documented in accordance with the problem identification form (PIF) program. In contrast, the SQV audits and field monitoring reports were performance based observations of conditions in the plant, and were effective in identifying problems in the fire protection program.

Immediate corrective actions had been taken for the identified conditions, but actions were not taken to investigate and determine if additional corrective actions were necessary to ensure that plant staff is controlling liquid combustibles. During discussions between the Senior Resident Inspector and the fire marshal, the fire marshal was not certain if the above condition should be a documented concern, even though it clearly violated the procedure for control of flammable liquids. Following a discussion with the inspectors, the fire marshal agreed that a PIF would be written to investigate why the oil was left in the plant in this instance and for any future situations where flammable liquids are not being properly controlled in the plant. The PIF process will capture the data for trending and identify when additional corrective actions are required.

In conclusion, there were some indications of lack of aggressive concern towards proper control of combustible materials. This is not considered as being a program weakness, as yet, but rather a hinderance to program effectiveness, which warrants added attention.

Two violations were identified (3a, 3f) in this area.

4. Safety Assessment/Quality Verification (40500, 90712, 92700)

a. Licensee Event Report (LER) Follow Up (90712, 92700)

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, that immediate corrective action was accomplished, and that corrective action to prevent recurrence had been or would be accomplished in accordance with Technical Specifications (TS):

(CLOSED) LER 455/93-467 (LER No. 93-008): Reactor Trip/Turbine Trip due to Solid State Protection System Universal Logic Card Intermittent Failure

On November 23, 1993, Unit 2 reactor tripped from an apparent Solid State Protection System circuit card problem. The licensee initially determined that three cards were the probable cause of the trip, taking into account the specific symptoms prior to and subsequent to the reactor trip. These symptoms included the unexpected start of the auxiliary feedwater pump, steam generator blowdown isolation, and a reactor trip breaker anomaly. The licensee's immediate short term corrective action, to replace and test all three suspect circuit cards, were satisfactory. The licensee appropriately noted that the cause of the trip was indeterminate, although it was identified that one or all of the three cards were the probable cause of the failure. Long term corrective actions involved setting up a test panel to further evaluate the suspect circuit cards, in an attempt to recreate a similar event and possibly identify the specific card component failure. The system engineer and the instrument maintenance personnel expended considerable time and effort to further investigate the circuit cards.

Following further testing of the suspect cards, no definitive results were found to identify the specific card component failure. However, strip chart recordings of various tests led to a theorized cause of the failure. It was found that a voltage fluctuation within one circuit card, along with a present test signal, as during performance of a surveillance test, a cascading effect can occur within the three card logic system. This effect closely emulated the experienced system failure. The licensee's actions associated with root cause determination, specifically the further testing of the suspect cards, were excellent. This LER is considered closed.

b. Self Assessment - Integrated Reporting Process (40500)

The inspector reviewed the licensee's Problem Identification Forms (PIF) generated during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel

performance, potential trends, etc. PIFs were also reviewed to ensure that they were generated appropriately and dispositioned in a manner consistent with the applicable procedures.

The inspector observed several screening meetings associated with the Problem Identification Forms. In addition to these meetings, the inspector also had an impromptu interview with the Operational Experience (OPEX) administrator concerning the improvement program for the Integrated Reporting Process (IRP). In the interview, the inspector relayed some concerns about the effectiveness of properly screening the PIFs.

On a few occasions, the inspector posed added questions associated with safety related equipment PIFs. Proper classification and identification of some problems were questioned. Some examples of the issues included: failure of the OB emergency diesel driven essential service water (SX) make up pump; CO<sub>2</sub> trouble alarm and leak on a fire protection valve; and, a mercury spill at the river screen house associated with a traveling screen differential pressure recorder. Additionally, the licensee's Independent Safety Evaluation Group (ISEG) had a representative at the PIF screening meetings who posed appropriate questions about PIF classification. Subsequently, the above examples and other items have been upgraded and are now being adequately followed up by the licensee.

In the case of the CO<sub>2</sub> alarm and leak, further review identified that it was manually initiated without approval and that a potential design concern exists. The engineering section, paragraph 7, has further details on the CO<sub>2</sub> issue, which will be followed as an unresolved item.

Discussions with various members of the plant staff indicated that the writing of PIFs was looked upon negatively in some quarters, and that the responses to PIFs were not always adequately justified. The NRC encourages and supports the identification of problems and their documentation (e.g., writing of PIFs), so it was encouraging that the SQV organization noted similar concerns, and actions are in progress to develop an audit program to look into the adequacy of root cause investigation.

Additional actions are being taken by the licensee, including the extensive efforts towards IRP improvement. Following completion of the IRP improvements, the inspectors will continue to monitor the licensee's progress, associated with PIF screening, evaluation, and follow up, to assess overall effectiveness of the program. This item will be tracked as an inspector follow up item (50-454/455-94004-03(DRP)).

One inspector follow up item was identified.

5. Maintenance/Surveillance (62703 & 61726)

a. Maintenance Activities (62703)

Routinely, station maintenance activities were observed and/or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with technical specifications.

The following items were also considered during this review: approvals were obtained prior to initiating the work; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; and activities were accomplished by qualified personnel.

Portions of the following maintenance activities were observed and reviewed:

- 1A Charging Pump Motor Oil Change
- 2A Charging Pump Seal Replacement
- 2B Emergency Diesel Generator - Installation of the modification to the starting air compressors' belt guard support

b. Surveillance Activities (61726)

During the inspection period, the inspectors observed technical specification required surveillance testing and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that results conformed with technical specifications and procedure requirements and were reviewed, and that any deficiencies identified during the testing were properly resolved.

The inspectors also witnessed portions of the following surveillances:

- 1B Residual Heat Removal Pump ASME Surveillance
- 1B Containment Spray Pump ASME Surveillance
- 1A Emergency Diesel Generator ASME Surveillance
- 1A Safety Injection Pump ASME Surveillance and VOTES testing of Recirculation MOV.
- 2B Emergency Diesel Generator ASME Surveillance
- Unit 2 Power Range NI Calibration

On February 2, 1994, a surveillance was being completed on the Emergency Personnel Hatch for Unit 2 containment when a maintenance individual incorrectly proceeded to remove the blank flange on the Equipment Hatch. The removal of the blank flange did not break containment integrity. The removal of the blank flange from either the Equipment Hatch or the Emergency Personnel

Hatch "air lock" requires the performance of steps in the local leak rate surveillance test. The error was identified and an unplanned LCOAR for the Equipment Hatch was entered. Both flanges were correctly installed and satisfactory local leak rate testing was performed. Subsequently, the LCOARs were exited. The licensee has an ongoing root cause investigation on this event.

c. Tagouts and Work Control

During this inspection period, the inspectors have noted and reviewed the increasing occurrence of problems and anomalies associated with tagout and work control. This included reviewing data of items previously identified by SQV, and items noted in the PIFs, spanning back several months. The issues of concern are increased incidents of erroneous tagouts, valve misalignments, and poor work control. Some examples included: SQV identified items involving inadequate controls on temporary lifting of tagouts; NRC observed a discrepancy during the 2A charging pump seal replacement, involving the temporary lifting of tags without an apparent temporary lift tagout sheet (white sheet), and the inadequate placement of a poly bottle during the system venting resulting in the bottle falling and contaminating the area; several PIFs were associated with less than adequate work performance dealing with the diesel generator, DC power system, and a containment hatch problem (as described above); and, PIFs identified some valve misalignments.

The licensee had identified and issued PIFs to track and trend these items. Subsequently, the licensee has now initiated actions to investigate these concerns. In a previous inspection report, NRC noted a non-cited violation associated with tagout control of an incorrect system train. The inspector, having some concern towards tagout and work control quality and effectiveness, will track this item as an inspector follow up item pending completion of the licensee's investigation (50-454/455-94004-04(DRP)).

One inspector followup item was identified.

6. Cold Weather Preparations (71714 & 61726)

The inspectors verified, by review of the licensee's surveillance for freezing temperature equipment protection, that appropriate precautions had been taken to adequately protect plant systems from seasonal and sudden extreme cold weather conditions. The initial surveillance was performed from September to November 1993, prior to expected cold weather conditions. Followup activities were performed as dictated by extreme outside temperatures, for example; adjustments to the natural draft cooling tower doors. A few minor concerns were identified, including a frozen line and subsequent break in the fire protection drain line in the new Instrument Maintenance shop, due to loss of power and heating to the room.

Overall, no major problems associated with extreme cold temperatures were noted. However, the inspectors found that Nuclear Work Requests (NWRs) initiated for the cold weather preparations were not all completed. It was found that, of approximately 15 NWRs identified through the performance of the surveillance, only 6 NWRs were completed by the end of January. The licensee continues to perform a status review of the NWRs for this area. The inspector relayed to the licensee the series of significant events throughout Region III associated with cold weather problems. These illustrated that important maintenance items identified for cold weather preparations should be completed prior to the onset of cold weather. The licensee agreed and stated that a review and any potential enhancements of the existing cold weather surveillance would be performed.

#### 7. Engineering & Technical Support (37700)

The inspectors evaluated the extent to which engineering principles and evaluations were integrated into daily plant activities. This was accomplished by assessing the technical staff involvement in non-routine events, and assigned technical specification surveillances. Further evaluation was conducted, as necessary, by observing technical staff involvement associated with on-going maintenance work and troubleshooting, and reviewing non-conformance investigations and root cause analysis. The engineering organization continues to demonstrate good engineering awareness and initiatives.

##### Cardox CO<sub>2</sub> Leak

On February 5, 1994, the cardox (CO<sub>2</sub>) tank trouble alarm actuated. An operator verified cardox tank level and pressure were normal; however, an odor of wintergreen was evident in the area. One of the CO<sub>2</sub> dump valves was found to be frosted. The operators verified that no CO<sub>2</sub> was dumping into any area. A PIF was written and was initially classified as level 4 on February 7, 1994. The inspector and the ISEG representative posed added questions about operability and the cause of this condition. Further investigation was conducted, and the PIF was later elevated to level 3 on February 9.

After some added investigation, the licensee found that the actuation of the cardox dump valve was from an apparent abandoned-in-place fire suppression push button. This component, although indicated as being abandoned, was still wired and operational. Furthermore, it was found that an operator had intentionally pushed the button to satisfy a curiosity about what a "real" actuation button would feel like. Intentional actuation of plant safety equipment for personal curiosity is a potentially serious matter; although the person apparently thought the equipment was not operational, this was not verified. Without proper adherence to accepted procedures, policies, and controls, plant operations will tend to degrade. However, the individual responsible for this infraction did demonstrate integrity by admitting to the improper action, which could not otherwise have been identified with certainty.

The licensee's system engineering and site engineering organizations are performing extensive investigation. Specific concerns are being reviewed relating to design control, the "abandoned in place" program, and operator performance. This item is considered unresolved, pending completion of the licensee's investigation and further review by the inspectors (50-454/455-94004-05(DRP)).

#### Essential Service Water MOV Crosstie Valve Operability Determination

On January 31, 1994, while performing continued evaluations of motor operator valves associated with Generic Letter 89-10, the licensee's corporate organization informed the site engineering group of a potential problem. The problem concerned the adequacy of torque switch settings and structural capabilities of six essential service water (SX) butterfly valves (0SX147, 2SX005, 1SX033, 2SX033, 1SX034, and 2SX034) to perform their design functions at full differential pressure. These valves are the SX unit and train crosstie valves. The issue affects both Byron and Braidwood stations.

On February 1, 1994, at approximately 2:30 p.m., the licensee completed initial engineering data review, determined the non-conformance situation, and initiated its administrative engineering procedure QE-40.1, "Evaluation and Review of Potential Design Concerns for Impact on Plant Operability." After adequately performing the operability evaluation, the licensee initiated three compensatory actions to assure valve operation. Long term corrective actions are under investigation. Subsequently, the valves and the SX system were considered to be conditionally operable on February 2 at 4:35 p.m.. The licensee notified the NRC pursuant of the problem pursuant to 10 CFR 50.72(b)(2), 4 hour non-emergency notification, at 5:02 p.m. February 2, 1994. Overall, the operability determination was satisfactory and met the intent of Generic Letter 91-18.

#### Area Flood Analysis

During this inspection period, the inspectors posed a question to the engineering department concerning design basis review. The question involved the flood protection analysis of the Containment Spray (CS) and Residual Heat Removal (RHR) pump rooms. The respective trains of RHR and CS pumps are in separate cubicles, but are not separated by watertight doors. It was determined that the pumps were at sufficient elevation to prevent flood damage. A failure of any of the piping in these rooms would cause flooding up to the level of the 346 elevation. The RHR and CS pumps are elevated well above this predicted flood level. Any flooding in the general area that leaks into these rooms is also bounded by this scenario. The only equipment which could be damaged by this flooding would be the cubicle coolers. This would cause a gradual increase in the room operating temperatures, but would not impair the ability to safely shut down the plant.

One unresolved item was identified.



8. Emergency Preparedness (82701)

On January 31, 1994, the inspectors observed the licensee's performance in a training drill associated with the Operations Support Center (OSC). The drill involved off-shift operations personnel in performing the actual equipment and room set up of the OSC. The training also included a question and answer period following the OSC set up. This drill was part of the continuing emergency preparedness training being conducted every month. Enhancement training is also being performed approximately every two weeks to update plant personnel of the changes associated with the new NUMARC emergency action levels and dose assessment model. The training was conducted professionally, and the shift personnel demonstrated an excellent knowledge of their responsibilities.

No violations or deviations were identified.

9. Report Review

During the inspection period, the inspector reviewed the licensee's Monthly Performance Reports for December 1993 and January 1994. The inspector confirmed that the information provided met the requirements of Technical Specification 6.9.1.8 and Regulatory Guide 1.16.

The inspector also reviewed the licensee's Monthly Plant Status Reports for December 1993 and January 1994.

No violations or deviations were identified.

10. Definitions

Inspector Follow Up Items

Inspector 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. Two inspector follow up items disclosed during the inspection are discussed in paragraphs 4b and 5c.

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 paragraph 7.

11. Meetings and Other Activities

a. Management Meetings

On February 3-4, 1994, Mr. B. L. Jorgensen, Chief, Reactor Projects Section 1A, Region III, toured the Byron plant and met with various members of licensee management to discuss their

responsibilities and to relay first impressions concerning plant performance and plant condition.

b. Personnel Injury

On February 10, 1994, one of the resident inspectors, Mr. C. H. Brown, accidentally fractured his foot in a floor piping penetration while performing an inspection tour. He was taken to a hospital for medical attention, but subsequently returned to work under a restriction for only light duties.

12. Persons Contacted

Commonwealth Edison Company (CECo)

- K. Schwartz, Station Manager
- \*T. Tulon, Operations Manager
- D. St. Clair, Site Engineering Construction Manager
- P. Johnson, Technical Service Superintendent
- E. Campbell, Support Services Director
- \*M. Snow, Work Control Superintendent
- \*D. Brindle, Regulatory Assurance Supervisor
- T. Gierich, Maintenance Superintendent
- \*W. Grundman, On-Site Quality Verification Superintendent
- \*A. Javorik, Technical Staff Supervisor
- \*E. Zittle, Security Administrator
- \*P. Enge, NRC Coordinator
- R. Wegner, Shift Operations Supervisor
- W. Dijstelbergen, Site Engineering Supervisor
- W. Kouba, Operating Engineer, Unit 2
- T. Schuster, Safety/Quality Verification Director
- B. Gossman, Chemistry Supervisor
- J. Bauer, Nuclear Licensing Administrator
- \*K. Passmore, Station Support & Engineering Supervisor
- J. Langan, Licensing Group Leader
- \*B. Waninski, Lead Mechanical Engineer, SEC-Modification
- \*J. Schrock, Unit 1 Operating Engineer,

\*Denotes those attending the exit interview conducted on March 1, 1994.

The inspectors also had discussion with other licensee employees, including members of the technical and engineering staffs, reactor and auxiliary operators, shift engineers and foremen, and electrical, mechanical and instrument maintenance personnel, and contract security personnel.