U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-454/88006(DRP); 50-455/88006(DRP)

Docket Nos. 50-454; 50-455 License Nos. NPF-37; NPF-66

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Station, Byron, Illinois

Inspection Conducted: February 12 - March 31, 1988

Inspectors: P. G. Brochman
N. V. Gilles

Approved By: J. M. Hinds, Jr., Chief
Reactor Projects Section 1A

4.11.88
Date

Inspection Summary

Inspection from February 12 - March 31, 1988 (Report Nos. 50-454/88006(DRP); 50-455/88006(DRP))
Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of licensee action on previous inspection findings; licensee event reports; bulletins; generic letters; operations summary; training; surveillance; maintenance; operational safety and engineered safety features system walkdowns; event followup; followup of Region III requests; licensee action reports; engineering and technical support; and management changes.
Results: Of the 12 areas inspected, no violations or deviations were identified. One potential issue affecting the public's health and safety was identified (environmentally unqualified pressure switches - paragraph 11.b).

## DETAILS

1. Persons Contacted

Commonwealth Edison Company

*R. Pleniewicz, Station Manager
*T. Joyce, Production Superintendent
*R. Ward, Services Superintendent
W. Burkamper, Quality Assurance Superintendent
T. Tulon, Assistant Superintendent, Operating
G. Schwartz, Assistant Superintendent, Maintenance
*L. Sues, Assistant Superintendent, Technical Services
D. St. Clair, Assistant Superintendent, Work Planning
T. Higgins, Operating Engineer, Unit 0
J. Schrock, Operating Engineer, Unit 1
D. Brindle, Operating Engineer, Unit 2
T. Didier, Operating Engineer, Rad-Waste
M. Snow, Regulatory Assurance Supervisor
*R. Flahive, Technical Staff Supervisor
S. Barret, Radiation/Chemistry Supervisor
P. Johnson, Master Instrument Mechanic
P. O'Neil, Quality Control Supervisor
W. Pirnat, Regulatory Assurance Staff
*E. Zittle, Regulatory Assurance Staff
*S. Krans, Quality Assurance Staff
*D. Robinson, Onsite Nuclear Safety
*G. Stauffer, Regulatory Assurance Assistant Supervisor
*K. Chernick, Training Supervisor

The inspector also contacted and interviewed other licensee and contractor personnel during the course of this inspection.

* Denotes those present during the exit interview on March 31, 1988.

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

a. (Closed) Open Item (454/85016-02(DRP)): Modification of control room radiation monitors to reduce their susceptibility to spurious noise spikes. The licensee has changed the low voltage setpoints on the radiation monitors, installed noise suppression filters, improved the grounding, and checked for possible radio frequency interference. These efforts have been successful in reducing the number of spurious actuations to one every 6 to 12 months. Based on these actions, this item is considered closed.

b. (Closed) Violation (454/85048-01(DRS)): Inadequate design control of motor-operated valve setup, maintenance, and testing. This issue is identical to items addressed in IE Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings." Since this area will be examined

in future inspections during review of Bulletin 85-03, this violation is being administratively closed to preclude duplication of effort, in accordance with a Region III memorandum from M. P. Phillips to N. J. Chrissotimos, dated February 23, 1988.

c. (Closed) Unresolved Item (454/85048-02(DRS)): Motor-operated valve testing does not appear to meet the requirements of 10 CFR 50, Appendix B, Criterion XI. This item is being administratively closed for the reason stated in paragraph 2.b above.

d. (Closed) Open Item (454/85048-03(DRS)): Motor-operated valve maintenance procedure comments need to be addressed. This item is being administratively closed for the reason stated in paragraph 2.b above.

e. (Closed) Open Item (454/85048-04(DRS)): Motor-operated valve packing tightening needs to be controlled. This item is being administratively closed for the reason stated in paragraph 2.b above.

f. (Closed) Violation (455/86046-01(DRP)): Discrepancies between the as-built configuration and drawings and valve lineups for the residual heat removal system. The inspector reviewed the licensee's response to verify that the corrective actions had been accomplished as stated.

The inspector verified that procedure BOP RH-M2 and drawing C & ID M-2137, sheet 1, had been revised to reflect the installation of valves 2RH018C, 2RH018D, 2RH019C, and 2RH019D. The inspector discussed the current policy with the instrument maintenance (IM) department supervisor to verify that IM personnel have control of equipment up to the 5-valve manifolds. Valves that have station identification tags are controlled by the operating department. Based on these reviews, this item is considered closed.

g. (Closed) Unresolved Item (455/87019-02(DRP)): Discrepancies between the containment spray (CS) system installed configuration and valve lineup. The inspector reviewed procedure BOP CS-M2, Revision 2, and verified that valves 2CS075, 2CS076, 2CS077, 2CS078, 2CS079, and 2CS080 are listed on the valve lineup with their correct positions indicated.

A second issue addressed under this item was the position of valve 2CS045. Inspection report 455/87019 stated that the position of valve 2CS045 had been changed from locked closed to locked open by a modification and that the valve lineup had not been revised to indicate the new position. Further review of this item identified that the correct position for valve 2CS045 is, in fact, locked closed and that the valve lineup does indicate the correct position. Based on this review, this item is considered closed.

h. (Closed) Violation (454/87022-01(DRP)): Revision of the locked equipment program. The inspector reviewed revision 51C to procedure BAP 330-3, "Locked Equipment Program," and the concerns previously identified by the NRC have been resolved. The inspector interviewed operating shift personnel to verify their understanding of the new key storage boards and implementation of the locked equipment program. Based on these reviews, this item is considered closed.

i. (Closed) Unresolved Item (454/87028-01(DRP); 455/87026-02(DRP)): Licensee's policies on temporarily lifting out-of-services (OOSs). The inspector reviewed revision 2 to procedure BAP 331-1, "Administrative Requirements for Temporarily Lifting OOS cards and/or Placing Equipment in Test," to verify that the commitments described in a letter from L. D. Butterfield to A. B. Davis, dated September 18, 1987, have been implemented. The inspector reviewed approximately 250 temporary lift forms (BAP 331-ITI) for January 1988 and did not identify any discrepancies. Based on these reviews, this item is considered closed.

j. (Closed) Violation (454/87028-02(DRP); 455/87026-03(DRP)): Failure to obtain required signature on temporary lift forms. The inspector reviewed the licensee's response and verified that the corrective actions had been accomplished as stated. The inspector also reviewed approximately 250 temporary lift forms (BAP 333-ITI) for January 1988 and did not identify any discrepancies. Based on these reviews, this item is considered closed.

k. (Closed) Violation (454/88002-02(DRP)): Zero and span adjusting screw protective covers not installed for level transmitter 1LT-0932. The inspector reviewed the licensee's response and verified that the corrective actions had been initiated as stated. The level transmitter was recalibrated and revisions are being made to all procedures which calibrate Barton Model 752 level transmitters to verify that the zero and span adjusting screw protective covers are installed upon completion of the calibration. The licensee is tracking these procedure changes under AIR (Action Item Record) 454-88-0052. Based on the actions taken, this item is considered closed.

3. Licensee Event Report (LER) Followup (92700)

(Closed) LERs (454/88001-LL; 455/88001-LL)): Through direct observation, discussions with licensee personnel, and review of records, the following LERs were reviewed to determine that the reportability requirements were fulfilled, that immediate corrective action was accomplished, and that corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

| LER No. | Title |
|---|---|
| Unit 1 | |
| 454/88001 | Control Room Ventilation Shifted to the Emergency |

Mode Due to a Spike on the Intake Air Radiation Monitor

Unit 2

455/88001 Reactor Trip on Lo-Lo Steam Generator Water Level Due to a Feedwater Pump Trip

The events described in LER 455/88001 are discussed further in paragraph 11. No violations or deviations were identified.

4. NRC Compliance Bulletin Followup (92703)

(Open) Bulletin (454/87001-BB; 455/87001-BB): Licensee programs for monitoring the wall thickness of carbon steel pipes in high energy single-phase and two-phase systems. In response to the Surry feedwater pipe break accident, the NRC requested in a bulletin, dated July 9, 1987, that licensees describe their programs for monitoring reductions in the wall thickness of high-energy carbon steel piping which is susceptible to the erosion-corrosion phenomenon, in both single-phase and two-phase systems. The licensee's response was contained in a letter from M. Turbak to A. B. Davis, dated September 11, 1987. The adequacy of the licensee's response will be discussed in a subsequent report, consequently, this bulletin will remain open.

5. Generic Letter (GL) Followup (92703)

(Closed) GL (454/87012-HH; 455/87012-HH): 10 CFR 50.54(f) request for information regarding operation of the residual heat removal (RHR) system during mid-loop operations. This GL was issued on July 9, 1987, and requested that licensees provide information on plans, procedures, equipment, and abnormal response actions for operation of the RHR system with reactor vessel water level drained to the mid-plane of the reactor coolant system loops. The licensee's response was forwarded to the staff in a letter from W. E. Morgan to F. J. Miraglia, dated September 25, 1987. Review of the technical adequacy of the response will be performed by NRR. In accordance with a Region III memorandum from W. Axelson, dated February 19, 1988, no further review of this GL is required. Based on this memorandum, this GL is considered closed.

6. Summary of Operations

Unit 1 operated at power levels up to 98% for the entire report period.

Unit 2 operated at power levels up to 95% until 1805 on February 12, 1988, when a reactor trip occurred (see paragraph 11). The unit was restarted at 8:26 a.m. on February 13 and was synchronized to the grid 7:15 p.m. on the same day. The unit subsequently operated at power levels up to 95% until 2:20 a.m. on February 27, when the turbine was taken off line for maintenance on the electro-hydraulic (EH) control system. The unit was synchronized to the grid at 4:58 a.m. on March 3, 1988, and operated at power levels up to 95% until 10:44 a.m. on

March 26 when the turbine was again taken off-line for maintenance on the turbine EH system. The unit was synchronized to the grid at 3:47 a.m. on March 29 and operated at power levels up to 94% for the rest of the report period.

7. Training (41400 & 41701)

The effectiveness of training programs for licensed and nonlicensed personnel was reviewed by the inspectors during witnessing of the licensee's performance of routine surveillance, maintenance, and operational activities and during review of the licensee's response to events which occurred during February and March 1988. Personnel appeared to be knowledgeable of the tasks being performed, and nothing was observed which indicated ineffective training.

No violations or deviations were identified.

8. Monthly Surveillance Observation (61726)

Station surveillance activities of the safety-related systems and components listed below were observed or reviewed to ascertain that they were conducted in accordance with approved procedures and in conformance with Technical Specifications.

Steam generator level channel 549 functional test - Unit 1
Phase A containment isolation slave relay test - Unit 2
Pressurizer low pressure slave relay test - Unit 2
Essential service water pump ASME surveillance test - Unit 2

The following items were considered during this review: the limiting conditions for operation were met while affected components or systems were removed from and restored to service; approvals were obtained prior to initiating the testing; testing was accomplished in accordance with approved procedures; test instrumentation was within its calibration interval; testing was accomplished by qualified personnel; test results conformed with Technical Specifications and procedural requirements and were reviewed by personnel other than the individual directing the test; and any deficiencies identified during the testing were properly documented, reviewed, and resolved by appropriate management personnel.

On March 21, 1988, the inspector identified a concern relating to the accuracy of the ultrasonic flowmeter used to perform surveillance testing of the centrifugal charging (CV) pumps. The boron concentration in the CV system can vary from 0 to 2000 ppm over an operating cycle, whereas the boron concentration for the other ESF (engineered safety feature) pumps remains at a relatively constant 2000 ppm. The ultrasonic flowmeter used is a Controlotron Model 480. The technical manual for the Model 480, section 4.2.7.2, states that mineral solids in the fluid stream can affect the sonic impedance of the fluid and cause significant signal loss and a resulting loss of accuracy. The inspector discussed this concern with the licensee's technical staff, which subsequently contacted Controlotron for assistance. The manufacturer stated that the accuracy

of the Model 480 is not affected by changes in the density of the fluid, only by the presence of solids. The boric acid used is of the form $H_3BO_3$, which dissolves into free radicals; consequently, there are no solid particles in the fluid, and the Model 480 will automatically compensate for any changes in density due to changes in the boron concentration; therefore, this concern is considered closed.

No violations or deviations were identified.

9. Monthly Maintenance Observation (62703)

Station maintenance activities of the safety-related systems and components listed below were observed 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.

Repair of sealtight connector for 1AF013C valve motor
Inspection of DS-416 circuit breakers per NRC Bulletin 88001
Measurement of Limitorque operator signatures for 1SX001A valve motor Calibration of the 1A steam line pressure channel 516

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from and restored to service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and fire prevention controls were implemented. Work requests were reviewed to determine the status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may affect system performance.

No violations or deviations were identified.

10. Operational Safety Verification and Engineered Safety Features System Walkdown (71707, 71709, 71710, & 71881)

The inspectors observed control room operation, reviewed applicable logs and conducted discussions with control room operators during February and March 1988. During these discussions and observations, the inspectors ascertained that the operators were alert, cognizant of plant conditions, and attentive to changes in those conditions, and that they took prompt action when appropriate. The inspectors verified the operability of selected emergency systems, reviewed tagout records, and verified the proper return to service of affected components. Tours of the auxiliary, fuel-handling, rad-waste, and turbine buildings were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations, and to verify that maintenance requests had been initiated for equipment in need of maintenance.

On March 18, 1988, during a review of out-of-services, the inspector identified that the return-to-service position of valve 2SI8921A, safety injection pump 2A manual discharge isolation valve, for OOS #88-2-837 was not correct. The valve position was specified as open instead of locked open. The inspector identified the discrepancy to the Unit 2 reactor operator, who recalled the equipment attendant who was performing the return-to-service actions, and corrected the return-to-service position to locked open. The inspector discussed this item with operating department supervisors and managers and expressed concern with the lack of attention to detail. The licensee has discussed this event with operators and has initiated revisions to the periodic refresher training given to licensed and non-licensed operators on administrative controls. The inspector subsequently interviewed the personnel involved in this event and determined that the revisions made to the licensee's locked component program would have identified this discrepancy. Based on the licensee's corrective actions and the fact that the pump would not have been inoperable, the NRC has determined that enforcement action need not be taken for this event; however, the licensee needs to ensure that the out-of-service and locked component programs are rigorously followed and that all personnel who participate in these activities understand the programs in their entirety.

The inspectors verified by observation and direct interviews that the physical security plan is being implemented in accordance with the station security plan. Changes to the site security contractor are also discussed in paragraph 14.

The inspectors observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection controls. The inspectors also witnessed portions of the radioactive waste system controls associated with rad-waste shipments and barreling. During February and March 1988, the inspectors walked down the accessible portions of the 2A containment spray and 1A residual heat removal systems to verify operability.

The observed facility operations were verified to be in accordance with the requirements established under Technical Specifications, 10 CFR, and administrative procedures.

No violations or deviations were identified.

11. Onsite Followup of Events at Operating Reactors (93702)

The inspectors performed onsite followup activities for events which occurred during February and March 1988. This followup included reviews of operating logs, procedures, Deviation Reports, Licensee Event Reports (where available), and interviews with licensee personnel. For each event, the inspector developed a chronology, reviewed the functioning of safety systems required by plant conditions, and reviewed licensee actions to verify consistency with procedures, license conditions, and the nature of the event. Additionally, the inspector verified that the licensee's investigation had identified the root causes of equipment malfunctions and/or personnel errors and that the licensee had taken

appropriate corrective actions prior to restarting the unit. Details of the events and the licensee's corrective actions developed through inspector followup are provided in paragraphs a through c below:

a. Unit 2 - Reactor Trip on Lo-Lo level in the 2C Steam Generator

At 6:04 p.m. on February 12, 1988, with reactor power at 94%, a reactor trip on Lo-Lo level in the 2C steam generator occurred, following the loss of the 2C main feedwater pump. Attempts to maintain steam generator level prior to the trip by running back the main turbine were unsuccessful due to problems with the turbine control system. All systems functioned normally after the trip.

The 2C feedwater pump experienced an overspeed trip when the high pressure governor valve spuriously opened. The licensee's investigation determined that the spurious actuation of the governor valve was caused by a faulty "moog" valve (servo valve) in the feedwater pump electro-hydraulic control system. The licensee replaced the faulty valve. The licensee and Westinghouse also investigated problems with the turbine control system and found that recent software changes in the control system caused the turbine runback to stop at 1014 megawatt (MW) rather than the 559 MW at which the controller was set. Corrections were made to the software. The unit was taken critical at 8:26 a.m. on February 13, 1988, and synchronized to the grid at 7:15 p.m. the same day.

No violations or deviations were identified.

b. Units 1 and 2 - Whitman General Pressure Switches not Environmentally Qualified

At 12:30 p.m. on March 27, 1988, the senior resident inspector was informed by licensee management of problems with the environmental qualification (EQ) of pressure switches which are part of the actuator assemblies of several safety-related valves. The licensee identified these problems as the result of NRC inquiries resulting from the EQ team inspection performed at the licensee's Braidwood Station. The pressure switches are made by Whitman General, Model J-505, and were supplied as part of the Borg-Warner actuators for several types of valves. The valves which are affected are 8 main feedwater isolation, 8 steam generator atmospheric relief, and 8 containment purge valves (4 per unit of each type). The licensee has identified that 34 J-505 switches are installed on these valves and an additional 11 switches are suspect due to their illegible identification markings. The licensee isolated the steam generator atmospheric relief valves in accordance with Technical Specifications. The containment purge valves were already isolated as required by Technical Specification 3.6.1.7. The pressure switches on the Unit 2 feedwater isolation valves were replaced before the valves were returned to service. The licensee prepared a justification for continued operation (JCO) for the Unit 1 feedwater isolation valves to allow the continued operation of Unit 1 without

implementing the action statement of Technical Specification 3.6.3.

The licensee committed to the replacement of the pressure switches at the next available outage (see paragraph c below). The acceptability of the licensee's use of Whitman J-505 pressure switches in an environmentally qualified application will be followed as an unresolved item (454/88006-01(DRP); 455/88006-01(DRP)).

c. Unit 1 - Tube Leak in the 1D Steam Generator

On March 11, 1988, the licensee identified the presence of a tube leak in the 1D steam generator. The tube leak was calculated to be 1.4 gallons per day (gpd). The licensee continued to monitor the leakage and on April 1, 1988, calculated the leakage rate to be 184 gpd and increasing. Technical Specification 3.4.6.2 limits steam generator tube leakage to 500 gpd per steam generator. At 11:00 p.m. on April 1, 1988, licensee management notified the inspector that it intended to shut down Unit 1 for a 14-day outage. The shutdown was timed to complete the shutdown prior to exceeding the 500 gpd limit while allowing the leak to be large enough for ready detection by eddy current inspection. Major work activity scheduled for the outage included plugging the leaking steam generator tube, inspecting snubbers, performing in-service testing required during cold shutdown, and replacing the pressure switches on the feedwater isolation valves.

No violations or deviations were identified.

12. Followup of Region III Requests (92701)

The inspectors received a memorandum from C. E. Norelius, dated January 28, 1988, which requested information regarding main steam safety valves (MSSV) used in PWRs. The memo requested the inspectors to obtain from the licensee information relating to the review of IE Information Notice (IN) 86-05, "Main Steam Safety Valve Test Failures and Ring Setting Adjustments," and other information concerning the main steam safety valves installed at the licensee's facility. This information was provided to Region III as requested.

No violations or deviations were identified.

13. Licensee Actions Concerning Potential Wrongdoing (99024)

On February 10, 1988, the senior resident inspector was informed by licensee management of a potential wrongdoing issue, which involved the performance of compensatory fire watches in the auxiliary building (previously discussed in inspection reports 454/88002; 455/88002). The affected individuals were employed by the security contractor, Wackenhut Corporation. The licensee's review of security computer records identified 68 individuals who were potentially involved. The licensee suspended the site access of the individuals pending the results of additional investigation and interviews. Following completion of its investigation, the licensee has restored 17 individuals to duty and has

revoked the security access of 51 individuals for 1 year, after which they would be eligible to apply for reinstatement. The senior resident inspector was informed of these actions on March 17, 1988. Region III personnel are continuing their review of these events and will document their findings in subsequent reports.

14. Licensee Actions Concerning Suspected Drug Use (99024)

On March 15, 1988, licensee management informed the resident inspector that an anonymous allegation had been received by the licensee's medical department. The alleger related indirect knowledge of an employee from Byron who was using controlled substances offsite. The individual in question performed non-licensed, non-supervisory, safety-related duties. The licensee interviewed the individual who admitted to the use of controlled substances. The individual's site access was suspended, and the individual submitted to medical screening tests. The screening test results were positive for controlled substances. The individual has entered the licensee's employee assistance program, and the individual's site access remains suspended. The licensee has reviewed the activities which had been performed by the individual and did not identify any discrepancies. The resident inspectors are continuing to follow this event.

15. Engineering and Technical Support (50095)

On March 25, 1988, the inspector identified a concern relating to the environmental qualification of some devices located in the turbine building. The Byron Safety Evaluation Report (SER), NUREG-0876, section 7.2.2.4, states that the turbine impulse pressure transmitters and the turbine throttle-stop valves' closure limit switches are seismically and environmentally qualified. The inspector reviewed the Byron Safety Related Component List, which states that the components are safety-related and seismically qualified but not environmentally qualified. The inspector questioned whether this was correct. The licensee reviewed its records and determined that the devices are required to be environmentally qualified for a mild environment. The licensee stated that a device which is properly classified as safety-related is automatically assumed to be qualified for a mild environment. The safety-related component list only identifies those components which are qualified for a harsh environment. Based on this information, this concern is considered closed.

The inspectors will continue to follow the licensee's activities involved in reracking the spent fuel pit with high density fuel racks.

No violations or deviations were identified.

16. Management Changes

a. The resident inspectors were informed by licensee management of the following personnel changes, which were effective March 7, 1988: Mr. R. Querio left his position as Byron Station Manager to replace Mr. E. Fitzpatrick as Braidwood Station Manager. Mr. R. Pleniewicz,

former Production Superintendent at Byron, has replaced Mr. Querio as Byron Station Manager. Mr. T. Joyce, former Assistant Superintendent for Operations, has replaced Mr. Pleniewicz as Production Superintendent at Byron. Mr. T. Tulon, former Master Mechanic, has replaced Mr. Joyce as Assistant Superintendent for Operations. Mr. E. Cremens has replaced Mr. Tulon as Master Mechanic.

b. On February 18, 1988, the senior resident inspector was informed by licensee management that Burns Security Services International would be replacing the current site security contractor following a transition period. On March 30, 1988 the senior resident inspector was informed that Burns would assume responsibility for security duties effective April 1, 1988. The inspectors are continuing to monitor the performance of the security force during the transition period.

17. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved items disclosed during the inspection are discussed in paragraph 11.

18. Exit Interview (30703)

The inspectors met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection on March 31, 1988. The inspectors summarized the purpose and scope of the inspection and the findings. The inspectors also discussed the likely informational content of the inspection report, with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.