

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-454/89019(DRP); 50-455/89021(DRP)

Docket Nos. 50-454; 50-455

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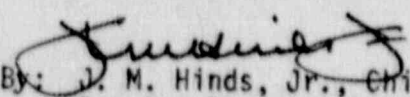
Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: October 1 through November 17, 1989

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

DEC 05 1989
Date

Inspection Summary

Inspection from October 1 through November 18, 1989 (Report Nos. 50-454/89019 (DRP); 50-455/89021(DRP))

Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of operational safety, engineered safety feature systems, on-site event followup, economic generation control, Regional request, licensee event reports, evaluation of licensee self-assessment capability, security, maintenance activities, surveillance activities, engineering and technical support and fuel handling.

Results: Of the 12 areas inspected, no violations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

- *R. Pleniewicz, Station Manager
- *G. Schwartz, Production Superintendent
- *R. Ward, Technical Superintendent
- *J. Kudalis, Service Director
- *D. Brindle, Operating Engineer, Administration
 - T. Didier, Operating Engineer, Unit 0
 - T. Gierich, Operating Engineer, Unit 2
 - T. Higgins, Assistant Superintendent, Work Planning
 - J. Schrock, Operating Engineer, Unit 1
- *D. St. Clair, Assistant Superintendent, Work Planning
- *T. Tulon, Assistant Superintendent, Maintenance
 - D. Winchester, Quality Assurance Superintendent
- *D. Wozniak, ENC Project Manager
 - E. Zittle, Regulatory Assurance Staff
- *K. Orris, Regulatory Assurance Staff

*Denotes those attending the exit interview conducted on November 16, 1989, and at other times throughout the inspection period.

The inspectors also had discussions with other licensee employees, that included 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.

2. Plant Operations

Unit 1 operated at power levels up to 100% for the entire report period.

Unit 2 operated at power levels up to 100% until 10:25 p.m. on November 13, 1989, when a unit shutdown was commenced to repair a steam leak on pressurizer safety valve, 2RY8010C. The licensee plans an eight day outage to repair the steam leak and to perform other maintenance activities.

a. Operational Safety (71707)

The inspectors observed control room operation, reviewed applicable logs and conducted discussions with control room operators during October and November, 1989. Based on these discussions and observations, the inspectors ascertained that the operators were alert, cognizant of plant conditions, attentive to changes in those conditions, and took prompt action when appropriate. The inspectors verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected

components. Tours of the auxiliary and turbine buildings were conducted to observe plant equipment condition that included potential fire hazards, fluid leaks and excessive vibration and to verify maintenance requests had been initiated for equipment in need of maintenance.

The observed facility operations were verified to be in accordance with the requirements established under Technical Specifications, 10 CFR, and administrative procedures except during a walkdown of the Unit 0 (Common) Main Control Board, when inspectors noted that the control switch for the 2B Diesel Generator (DG) ventilation fan, 2VD01CB-2, had a caution tag and was Pull-To-Lock (PTL). The caution tag stated to remove plastic over the outside inlet air damper prior to starting the fan. The inspectors investigated why there was plastic over the inlet air damper. The investigation determined that the damper had not fully closed, as required by design, and a reversed "chimney effect" resulted. Cold outside air was induced through the vent supply ductwork and into the 2B DG room. The UFSAR, Section 7.3, (Engineered Safety Features Actuation System), states that the DG ventilation system was designed to limit the maximum ambient temperature in the DG rooms to 130 degrees F. Also, the DG ventilation system has provisions to modulate the outside air intake and return air dampers to maintain a minimum DG room temperature of 65 degrees F. With the "chimney effect" in the winter due to a failed open or leaking outside air damper, the 65 degrees F. would not be maintained in the 2B DG room. Therefore, plastic was placed over the 2B DG outside air damper to curtail the "chimney effect". Section 7.3 of the UFSAR states the DG ventilation system was designed to include either an auto-start of the ventilation fan when the associated DG starts on an auto-start signal; or manually from the main control room. Also, Figure 9.4.6 identified the outside supply damper, (2VD01YA(B)), failure mode as "fail open". The inspectors considered placing the 2B DG ventilation fan control switch to PTL and the placement of plastic over the outside supply damper as a Temporary Alteration. However, the licensee did not use procedure BAP 330-2, Revision 3, "Temporary Alterations" prior to placement of the plastic over the outside air damper. After the identification of this issue by the inspectors, the licensee performed an engineering evaluation via the onsite review process. The inspectors reviewed the engineering evaluation and found the conclusions acceptable. Since the inspectors had not previously identified instances where the licensee failed to document temporary alterations in accordance with station procedures, the failure to follow procedure BAP 330-2 for the plastic on the 2B DG outside supply damper was considered an isolated occurrence. This area will be closely monitored by the resident staff in future inspections.

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

During the inspection, 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; whether freeze protection, if required, was installed and operational; valve positions 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 following ESF systems were walked down:

Unit 1

1B Containment Spray
1A Charging and letdown
1A Auxiliary Feedwater (AFW)
1B Auxiliary Feedwater

Unit 2

2A Diesel Generator
2A Battery and Battery Charger

c. Onsite Event Follow-up (93702)

(1) On October 5, 1989 during an investigation of steam generated SG blowdown rates for a blowdown system modification, the licensee identified an apparent discrepancy between the analysis documented in the Updated Final Safety Analysis Report (UFSAR) and actual plant configuration. Figure 7.2-1, sheet 15, in the UFSAR identified that SG blowdown would isolate on initiation of AFW. However, present plant configuration has steam generator blowdown isolation only on a safety injection phase "A" containment isolation signal and an auxiliary building high temperature signal (high energy line break). The licensee, in conjunction with Westinghouse, conducted a review of plant construction documentation and of additional accident analysis to determine if AFW without SG blowdown isolation had already been analyzed or was required. As immediate corrective action until completion of this investigation, the licensee implemented temporary procedure changes to the following procedures to require isolation of SG blowdown upon initiation of AFW:

- * 1(2) BCA-0.0, Revision 2, "Loss of All AC Power, Unit 1(2)"

- * 1(2) BEP-0, Revision 1, "Reactor Trip or Safety Injection, Unit 1(2)"
- * 1(2) BFR-H.1, Revision 1A, "Response to Loss of Secondary Heat Sink, Unit 1(2)"
- * 1(2) BFR-S.1, Revision 1, "Response to Nuclear Power Generation/ATWS, Unit 1(2)"

The inspector reviewed the temporary procedure changes and had no concerns.

- (2) The inspectors reviewed an event that involved the identification and correction of a secondary system water leak in Unit 1 containment. The licensee had observed over a period of time, a slight increase in the amount of water collected and pumped from the Unit 1 containment sump. Chemical analysis of the water determined the source to be from a secondary side water system. During the week of October 16, 1989, the licensee entered the containment to identify the specific source. The licensee determined that the source was from the 1B steam generator upper manway cover flange. Maintenance work order WRB 71410 was issued on October 17, 1989 to repair and test the leak. On-site review (OSR), 89-240, was performed on October 20, 1989 to cover the "Furmanite" procedure N-89399 that was used for the repair. The OSR 89-240 included a 10 CFR 50.59 review of the procedure. A special procedure was also issued for the torquing of the manway cover bolts. The work was completed in an acceptable manner on October 21, 1989.
- (3) On October 25, 1989, while deconning an area around a pump that was utilized in filtering and skimming the spent fuel pool during the fuel rack changeout, a hot particle of cobalt 60 was discovered on the floor. Subsequently, other hot particles of various sizes were discovered. Radiological specialists from Region III were sent to the site for follow-up and debriefing by the licensee's staff. For further details see Inspection Report 454/89021; 455/89023.
- (4) On November 11, 1989, Unit 2 containment was entered to investigate why the containment atmosphere samples were not the expected values. Also, the station's operations staff had noticed an upward trend of the reactor coolant system (RCS) unidentified leakage over the past several weeks. The licensee trends RCS unidentified leakage by plotting surveillance results. Plots were located at each unit's Nuclear Station Operator (NSO) desk. The resident staff considered the practice of plotting RCS leakage results as a useful tool as evidence by the ability of the operations staff to identify this upward trend of the RCS unidentified leakage. Another containment entry was accomplished and a small steam leak was identified at the inlet flange of the pressurizer safety valve, 2RY8010C. For further details see Section 7.a of this report.

d. Economic Generation Control, (EGC), Unit 2

On October 23, 1989, the EGC system was placed in service on Unit 2 at Byron. EGC allowed the Commonwealth Edison Company Load Dispatcher to initiate minor load changes on the unit from a remote location. The operational band was established at 50 Megawatts (MW) with a maximum ramp rate of 2 MW per minute. The unit must be below 98% power for EGC. Operating Procedure BOP EH-8, EGC operation, was issued and operator training was administered.

During initial operation of EGC a problem between 800 and 850 MW was identified where higher than expected load changes occurred. This was attributed to the flow vs. lift curves currently loaded into the DEH computer. Byron Station issued a daily order to avoid operation on EGC at loads between 800 to 850 MW. The transition to EGC appeared to have been accomplished in an acceptable manner.

In summary the resident staff considered the licensee's performance in plant operations during this inspection period as aggressive in the resolutions of technical issues. There was good coordination between the operations, technical and maintenance organizations.

No violations or deviations were identified.

4. Regional Request (92701)

On October 26, 1989, Region III requested information on the licensee's system engineer (SE) program at Byron. The information requested pertained to the SE duties, experience levels, organizational structure etc. The resident staff provided the requested information to the Region on October 26, 1989.

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

a. Licensee Event Report (LER) Followup (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) 454/89008-LL; 454/89008-1L: "Auxiliary Feedwater Suction Pressure Switches Found Out of Calibration Due to Failure to Consider Head Correction. The event associated with this LER was described in Inspection Reports 454/89017; 455/89019, which identified an Unresolved Item 454/89017-01; 455/89019-01.

(Closed) 454/89009-LL: "Inadequate Incorporation of Steam Generator Blowdown Isolation Requirements as Assured in Certain Accident Analysis Caused by a Preservice Design Implementation Deficiency."

The immediate corrective action to this event is further described in Section 2.c.1 of this report.

In addition to the above LERs, the inspector reviewed the licensee's Deviation Reports (DVRs) issued during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel performance, potential trends, etc. DVRs were also reviewed to ensure dispositions were performed in a manner consistent with the applicable procedures and the licensee's QA manual.

b. Evaluation of Licensee Self-Assessment Capability (40500)

The inspectors reviewed and evaluated the licensee's self-assessment program to determine its effectiveness.

Through discussions with members of the onsite nuclear safety group (ONSG), the inspectors determined that the licensee was in compliance with administrative Technical Specification requirements. The group consisted of three full-time qualified engineers, two of which have completed Senior Reactor Operator licensing training and hold certificates. The ONSG was well qualified to perform assigned tasks which included performing periodic walkdowns, attending station management and working meeting, observing modifications testing, and reviewing QA audit reports. In the past, ONSG received all QA audit reports but only some corporate audit reports; a program change will have all corporate audit reports routed to ONSG for reviews.

The inspectors reviewed ONSG monthly reports for August through October 1989. The reports were well written, indicating that the staff was well informed of the day-to-day plant operating activities, limitations, and events. The staff aggressively followed up on previous recommendation to assure that proper closure was warranted based on station actions. In one instance, ONSG was very timely and effective in initiating prompt corrective action from the licensee. ONSG identified current weaknesses with the process for controlling temporary procedure changes, in that on-site review and station manager approval were not being obtained within the required time period. As a result, recommendations were made and immediately implemented, which has enhanced the control of temporary procedure changes.

ONSG provides a quarterly report to the Safety Assessment Manager, outlining the group's intended action plan. At the time of the inspection, ONSG was in the transition phase of transferring training qualification requirements due to an organizational realignment. During June 1989, ONSG was realigned under Quality Program and Assessment, but was originally assigned to the Nuclear Safety Group. Even though the qualification requirements will remain the same under the new realignment; there was no supporting documentation to this effect available for review. The inspectors have no concerns at this time.

The licensee had a well defined corrective action program. The program accounted for assigning responsibility, item tracking, and documenting accomplished corrective actions in a timely manner. All corrective actions needed as the result of NRC commitments, audit deficiencies, modifications, and deviation reports are assigned an action item record (AIR) number and are placed and tracked on the licensee's nuclear tracking system (NTS). A monthly status meeting is held to review the AIR status, and is attended by the station manager and the responsible departments.

The inspector also attended a "Material Supplier Audit Exit". The licensee was very receptive to comments made by the auditor to enhance program effectiveness.

On September 25-29, 1989, a team consisting of corporate and station evaluators, and two consultants evaluated the licensee's Technical Support program. The assessment was very thorough with comparison being made to NRC requirements, station requirements, and industry practices. The team's assessment was that the program was adequate but some areas were identified as needing improvements. All audit findings were placed on the NTS.

On October 10-13, 1989, a second maintenance assessment was conducted by the Nuclear Engineering Department Maintenance staff members to review the station's progress of the implementation of the "Conduct of Maintenance Directive." The maintenance team used the following items to assess the licensee's progress: observation of maintenance activities, discussions with craftsman and managers, observation of working environments, and review of work packages. The result of the assessment was that Byron Station was steadily progressing toward full implementation; however, the team noted that previously identified weaknesses were in need of additional improvements.

No violations or deviations were identified.

5. Security (81064)

The inspectors, observed that persons in the protected area (PA) displayed proper badges and had escorts if required; vital areas were kept locked and alarmed, or guards posted if required; and personnel and packages entering the PA received proper search and/or monitoring.

No violations or deviations were identified.

6. Maintenance/Surveillance (62703 & 61726)

a. Maintenance Activities (62703)

Station maintenance activities affecting the safety-related and associated systems and components listed below were observed/

reviewed to ascertain activities were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with Technical Specifications.

The following items were considered during the review: the limiting conditions for operation were met while components or systems were removed from and restored to service; approvals were obtained prior to initiation of the work; activities were accomplished with approved procedures and were inspected as applicable; functional tests and/or calibrations were performed prior to the return of 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 jobs and to assure that priority was assigned to safety-related equipment maintenance that would affect system performance.

The following maintenance activities were observed and reviewed:

- NWR B 62370 - Repair (Furmanite) leak in main steam condenser dump valve.
- NWR B 67235 - Remove, repair and reinstall actuator for EQ temperature control damper 2VD02YB.
- NWR B 69028 - Replace capacitors in 123 battery charger.
- NWR B 71053 - Repair actuator assembly for EQ temperature control damper 1VD02Y9.
- NWR B 71212 - Remove blind flange on A train inlet eductor drain and replace flexitallic gasket.
- NWR B 71575 - Repair and/or calibrate Unit 2 first stage pressure channel, 2PI-FW0506.
- NWR B 71654 - Replace defective card and recalibrate windowbox annunciator for CVC system on Panel 1PM05J.
- NWR B 71668 - Repair and/or calibrate Unit 2 first stage pressure channel, 2 PT-FW0505. NWR B 99502 - Unit 1, Recalibrate pressure switches - 1PS-076B, 1PS-077B, 1PS-098B, and 1PS-099B on 1B Diesel Generator.
- NWR B 99803 - Unit 2, Process computer would not boot. Determine cause and repair.

The inspectors periodically monitored the licensee's work in progress and verified that it was being performed in accordance with proper procedures and approved work packages and that 10 CFR 50.59 reviews and other applicable drawing updates were made and/or planned.

b. Surveillance Activities (61726)

The inspectors observed surveillance tests required by Technical Specifications during the inspection period and verified that the tests were performed in accordance with adequate procedures; test instrumentation was calibrated; limiting conditions for operation were met; removal and restoration of the affected components were accomplished; results conformed with Technical Specifications and procedure requirements and were reviewed by personnel other than the individual directing the test; and any deficiencies identified during the tests were properly reviewed and resolved by appropriate management personnel.

The inspectors witnessed portions of the following test activities:

1BOS 2.4.1.a-1, "Quadrant Power Tilt Ratio Calculation."

1BOS 3.1.1-21, "Unit 1, Train B Solid State Protection System Bi-Monthly Surveillance (staggered)."

1BOS 5.2 c-1, "Unit 1 Containment Loose Debris Inspection."

1BOS 6.2.1.a-1, "Unit 1 Containment Spray System Valve Lineup and Spray Add Tank N2 Cover Pressure, Monthly Surveillance."

1BVS 2.3.2-1, "Monthly Nuclear Enthalpy Rise Hot Channel Factor and RCS Total Flow Rate Check."

1BVS 3.1.1-4, "Incore - Excore Axial Flux Single Point Comparison Monthly Surveillance."

1BVS 7.1.5-2, "Partial Stroke Test of Main Steam Isolation Valve (MSIV) Standby Train."

1BVS XPT-8, "Thermocouple Normalization Factors."

2BVS 3.3.2-1, "Moveable Incore Detectors Operability Check."

No violations or deviations were identified.

7. Engineering & Technical Support (37700)

- a. As described in Section 2.c.4 of this report, a small steam leak was identified on a Unit 2 pressurizer safety valve (2RY8010C) inlet flange on November 11, 1989. The licensee initiated action to ascertain if the steam leak could be stopped by use of interim measures. Also, an engineering evaluation was initiated to determine the affect on the steam leak on the loop seal for valve 2RY8010C.

On November 13, 1989, insulation was removed and the licensee obtained temperature readings of the pipe in the loop seal for

2RY8010C and compared the readings from another safety valve. The differences in temperatures, approximately 200 degrees, indicated a possible loss of the loop seal for safety valve 2RY8010C. The station's staff, after further discussions with Westinghouse and the licensee's corporate engineering staff, determined that the effect of the elevated temperatures on the Technical Specification setpoint 2485 psig (plus or minus 1%) for valve 2RY8010C could not be definitively ascertained. Therefore, the licensee initiated the prudent and conservative action of placing Unit 2 in cold shutdown (Mode 5). On November 13, 1989 at 10:25 p.m. a Unit 2 shutdown was commenced and the unit entered Mode 5 on November 15, 1989 at 10:50 p.m.

- b. The inspectors reviewed On-Site Review (OSR), 89-252, dated November 13, 1989, that pertained to the operability of feedwater check valves 1(2) FW079A(B)(C)(D) at the Byron Station. During a recent refueling outage at Byron's replicate plant, Braidwood, the FW079A(B)(C)(D) check valves for Unit 1 were found stuck open when an inservice inspection was performed. OSR 89-252 documented the current status and operability of the FW079 check valves. At the time of the OSR both units were at power. The OSR stated that the primary cause of the check valves sticking open was the difference in coefficients of thermal expansion between a manganese bronze bushing and the carbon steel bonnet. Small design clearances did not allow the bushing to expand freely during the temperature change from ambient to the operating temperature of 400 degrees F. The operating temperature was also close to the temperature at which manganese bronze was normally stress relief heat treated. Long term exposure to the operating temperature caused the restrained bushing to stress relieve. As a result, the contraction of the bushing during cooldown results in an interference fit. The licensee has identified a feedwater temperature below 250 degrees as the point of possible binding of the bushing. Since the contraction was reversible, reheating the valve during plant startup would allow the piston rod to move freely. The OSR stated that at normal full power operating temperatures (440 degrees F.) the safety related isolation function would be met. The Updated Final Safety Analysis (UFSAR), Chapter 15, that pertains to accident analysis, identified the FW079 valves as necessary to mitigate the effects of a main feedwater line break. The Unit 2 FW079 valves were inspected during the November 13, 1989 eight day outage for the pressurizer safety valve, 2RY8010C, steam leak. The 2FW079B check valve was found stuck open and the other three valves, 2FW079A(C)(D) were found slightly open (approximately 1-2"). The licensee initiated action to repair the 2FW079C. This repair included increasing the inner diameter of the bushing to allow free movement of piston rod regardless of valve temperature. Since valves 2FW079A(C)(D) were still susceptible to failing open during plant startup or shutdowns the licensee planned to perform another OSR for check valves 2FW079A(C)(D) prior to the startup of Unit 2 to ascertain operability of check valves. Startup was scheduled for November 22, 1989. This matter is considered an open item,

pending review by the NRC of the OSR for check valves 2FW079 A(C)(D) prior to Unit 2 startup. (454/89019-01; 455/89021-01(DRP)).

No violations or deviations were identified.

8. Fuel Handling

On several occasions the inspectors witnessed the receipt and storage of new fuel within the fuel handling building. The inspectors verified the appropriate documentation of new fuel and that station procedures were followed in unloading, lifting, moving, lowering, and inspecting new fuel assemblies. Appropriate cleanliness controls were implemented. Efficient communications between fuel handlers, crane operators, radchem technicians, and the fuel handling foremen facilitated fuel handling operations.

No violations or deviations were identified.

9. Open Items

Open 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 Open item disclosed during the inspection is discussed in Paragraph 7.

10. Meetings and Other Activities

a. Management Meetings (30702)

- (1) On October 4, 1989, W. D. Shafer, Chief, Reactor Projects Branch 1, J. M. Hinds, Chief, Section 1A, and the NRC resident inspectors toured the Byron plant and met with licensee management to discuss plant performance, plant material condition and current regulatory issues.
- (2) On November 16, 1989, W. D. Shafer, Chief, Reactor Projects Branch 1, and the NRC resident inspectors met with licensee management to discuss Commonwealth Edison's response to the OSART inspection conducted in June 1989.

b. Exit Interview (30703)

The inspectors met with the licensee representatives denoted in paragraph 1 during the inspection period and at the conclusion of the inspection on November 17, 1989. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.