

Commonwealth Edison Company  
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February 28, 1996

**ComEd**

LTR: BYRON 96-0057  
FILE: 1.10.0101

U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attention: Document Control Desk

Subject: Byron Nuclear Power Station Units 1 and 2  
Response to Notice of Violation  
Inspection Report No. 50-454/95011; 50-455/95011  
NRC Docket Numbers 50-454, 50-455

Reference: Lewis F. Miller, Jr. letter to Mr. Graesser dated  
January 29, 1996, transmitting NRC Inspection  
Report 50-454/95011; 50-455/95011

Enclosed is Commonwealth Edison Company's response to the Notice of Violation (NOV) which was transmitted with the referenced letter and Inspection Report. The NOV cited four (4) Severity Level IV violations requiring a written response. ComEd's response is provided in the attachment.

This letter contains the following commitments:

- 1) A re-emphasis of log taking expectations will continue to be stressed in operator annual and re-qualification training.
- 2) A Training Revision Request (TRR) #00815 was written to ensure that the failure to write a Problem Identification Form (PIF) incident and management expectations are discussed during Engineering Continuing Training.
- 3) Chemistry Technicians will be formally trained on the procedure revision process.
- 4) Plant modifications have been initiated to permanently correct the Safe Shutdown Analysis deficiencies.
- 5) The containment sump isolation valve pressure differential will be determined in conjunction with the series of calculations being performed for the Generic Letter 89-10 Program. These calculations will be reviewed for applicability and this review will be documented. The calculations for the containment sump isolation valve will be completed by April 1, 1996.

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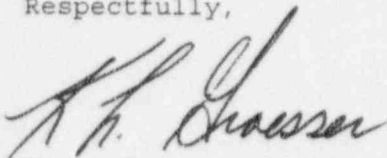
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- 6) There will be an assessment of the engineering calculations from 1995 and they will be compared with the calculations performed in 1996. This review will assess the effectiveness of the corrective actions and the relevancy of the metrics.

If your staff has any questions or comments concerning this letter, please refer them to Don Brindle, Regulatory Assurance Supervisor, at (815)234-5441 ext.2280.

Respectfully,



K. L. Graesser  
Site Vice President  
Byron Nuclear Power Station

KLG/DB/rp

Attachment(s)

cc: H. J. Miller, NRC Regional Administrator - RIII  
G. F. Dick Jr., Byron Project Manager - NRR  
H. Peterson, Senior Resident Inspector, Byron  
L. F. Miller Jr., Reactor Projects Chief - RIII  
D. L. Farrar, Nuclear Regulatory Services Manager, Downers Grove  
Safety Review Dept, c/o Document Control Desk, 3rd Floor, Downers Grove  
DCD-Licensing, Suite 400, Downers Grove.

## ATTACHMENT I

### VIOLATION (454/455-95011-01)

10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures.

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented, and maintained covering activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

- a. Byron Administrative Procedure, BAP 350-1, "Operating Logs and Records," Revision 11, section C.1.a.2, requires that logs and log sheets are considered operating shift records; and, section C.1.b.2, requires, in part, that all shift records must be legible, accurate, complete, and understandable.

Byron Operating Procedure, BOP DG-11T2, "Diesel Generator Operating Log," Revision 6, requires, in part, that the governor oil level be  $\pm 1/4$  inch from the mark on the governor oil sight glass.

Contrary to the above, from May 31 through December 7, 1995, the diesel operators were not accurately recording the governor oil level for the 1A emergency diesel generator. The governor oil level was being recorded as "OK" or "SAT" on the operating log when it was actually out-of-sight high.

- b. Procedure BAP 1250-2A6, "IRP PIF Threshold," revision 1, requires that a Problem Identification Form (PIF) be initiated to document human performance, organizational, or programmatic problems, or potential problems especially if degraded plant or personnel safety could result and there is the potential to identify corrective actions that would prevent problems in overall station, department, program or personnel performance.

- (1) Contrary to the above, a PIF was not initiated for a calculation error identified by the NRC in Calculation BYR95-086 dated October 31, 1995, concerning the refueling water storage tank (RWST) switchover setpoint. The licensee's calculation preparer was aware of the calculation error, but had failed to initiate a PIF and document the error, as of December 4, 1995.

- (2) Contrary to the above, a PIF was not initiated on December 5, 1995, by the system engineer to remove rust noted by the inspectors on terminals 8 and 11 of battery 1AE01B-B during system walkdowns. The PIF was written on December 18, 1995, after the engineer was again questioned by the NRC inspectors.

- c. Byron Chemistry Procedures BCP 300-2, "General Sampling Procedure," Revision 6, BCP 300-23, "Reactor Coolant or Pressurizer Liquid Grab Sample," Revision 10, and BCP 100-39, "Determination of Analytes using a Chemet Test Kit," Revision 1, implemented the requirements for chemistry sampling and analysis procedures contained in Appendix A of Regulatory Guide 1.33. These procedures contained the requirements for rinsing sample containers, utilizing proper Chemet test kits, and performing radiological surveys.

Contrary to the above:

- (1) On November 14, 1995, a chemistry technician did not rinse sampling containers as required by BCP 300-2, revision 6.
- (2) On November 17, 1995, a chemistry technician did not utilize a proper Chemet kit for the expected analyte range as required by BCP 100-39, revision 1.
- (3) On November 17, 1995, a chemistry technician did not perform a radiological survey of the liquid sample panel as required by BCP 300-23, revision 10.

This is a Severity Level IV Violation (Supplement I).  
(50-454/455-95011-01(DRS))

#### REASON FOR THE VIOLATION

1. Reason for the Violation related to inadequate Operating procedure adherence.

It has been determined that this violation is due to an error by the operators in recording data. The operators assumed, that more oil was better, and that an exact reading of the oil level was not necessary. The operators did not apply the requirements of (+/-) 1/4" from the line on the sightglass due to misunderstood instruction/information. Due to a lack of clear expectations, habit and mindset by the operators, subsequent operators perpetuated the error.

2. Reason for the Violation related to failure to write a PIF.

- a. The Problem Identification Form process was not used to track calculational concerns. The common practice in engineering is to consider such concerns to be "in-process" and can be corrected before the final product was issued.
- b. On November 10, 1995, a Problem Identification Form (PIF) (454-201-95-1491) was written to address concerns with splashing the Battery, 1AF01EB-B, for the 1B AF Pump with SX water. The corrective actions for this PIF dealt solely with the possibility of getting SX water in the electrolyte. It neglected to address concerns with corrosion of the intercell connections.

On December 5, 1995, during an NRC inspector walkdown of the 1B AF Room, rust was discovered on Battery 1AF01EB-B, cell numbers 8 and 11. A PIF should have been written that addressed the corrosion and inadequate corrective actions of the November 10th PIF. Rather than write a PIF on December 5th, the System Engineer wrote an Action Request (AR 960067132), to ensure the adequacy of the interconnected cell continuity and clean the corrosion from the connections.

A PIF was written on December 18, 1995, to document the problem and aid in future trending. This PIF was closed to the aforementioned AR.

3. Reason for the Violation related to inadequate Chemistry procedure adherence.

It was determined that the dominant Human Error/Inappropriate Action of this violation was Insufficient Degree of Attention Applied, primarily in the area of Work Practices. This occurred when personnel did not maintain an adequate focus on a particular detail of a task, or remember to do an untracked-but-necessary action that is necessary for successful completion of a task. These are skill-based errors, unintentional slips or lapses. They are characterized as involving routine actions in a familiar environment and are usually associated with a reflex action or are performed by habit. The individual involved was sufficiently skilled or practiced such that no conscious thought was required to execute the action.

#### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

1. Immediate corrective actions related to inadequate Operating procedure adherence.
  - a. A Daily Order was issued re-emphasizing management expectations involving Operator performance and documentation.
  - b. A revision to BOP DG-11, Diesel Generator Startup, and associated T-Form, 11T2, were completed to provide guidance on usage of actual values when recording data. Additionally, these revisions clarified the "Expected Range" parameters and how the data relates to same.
2. Immediate corrective actions related to failure to write a PIF.
  - a. The threshold for initiating a Problem Identification Form (PIF) has been reviewed. The proposed guidance from the Chief Engineers' is that a PIF will be initiated if a concern is identified in an approved calculation or other document when the concern A) will change or may change the conclusion of the calculation or B) relates to engineering judgement with wrong references, unstated assumptions, or no basis.
  - b. System Engineers were reminded of the expectation to write a PIF anytime a problem is noted in the system, during Departmental Meetings.

- c. Expectations were also addressed during 4th Quarter continuing training on System Walkdowns.
- 3. Immediate corrective actions related to inadequate Chemistry procedure adherence.
  - a. The Chemistry Manager communicated and published his expectations that until further notice all procedure books will be open and procedures followed for all field and laboratory activities. If an error is found in a procedure, the user will make the necessary corrections and submit them to management for processing. Chemistry personnel will not rely on craft skill for any activity in which a procedure exists.
  - b. The Chemistry Manager communicated and published his expectations that the lab supervisors will accompany the Chemistry Technicians in the field to observe various sampling and analysis activities on a periodic basis. They will evaluate the effectiveness of the procedures, the ability of the individual to follow the procedure, and the use of appropriate rad practices.

#### CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

- 1. Corrective actions related the inadequate Operating procedure adherence.
  - a. A re-emphasis of log taking expectations will continue to be stressed in operator annual and re-qualification training. (NTS# 454-100-95-01101-01)
- 2. Corrective actions related to failure to write a PIF.
  - a. A Training Revision Request (TRR) #00815 was written to ensure this specific incident and expectations are discussed during 1996 Engineering Continuing Training. (NTS# 454-100-95-01101-02)
- 3. Corrective actions related to inadequate Chemistry procedure adherence.
  - a. Chemistry Technicians will be formally trained on the revision process in Module 1 - April 1996 Continuing Training. (NTS# 454-100-95-01101-03)

#### DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved on 01/20/96 when BOP DG-11 and BOP DG-11T2 were revised to provide guidance on usage of actual values when recording data.



## ATTACHMENT II

### VIOLATION (454/455-95011-03)

10 CFR Part 50 Appendix R, Section III, paragraph G.1, states, in part, that "Fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage."

Contrary to the above, on October 13, 1995, one train of the Unit 1 Engineered Safeguards Features Switchgear Ventilation Fan and one train of the Diesel Generator Fuel Oil Transfer Pump, necessary to achieve and maintain hot shutdown conditions, would not be maintained free of fire damage for a fire in Fire Zone 11.4-0.

This is a Severity Level IV violation (Supplement I).  
(50-454/455-95011-03 (DRP))

### REASON FOR THE VIOLATION

The cause of this event was a failure of the team of analysts preparing the original Byron Safe Shutdown Analysis to recognize the interconnection between Motor Control Centers (MCCs) powered from a single 480 volt Bus breaker. Consequently, the Safe Shutdown Analysis for Fire Zones 11.4-0 and 11.6-0 did not consider the potential loss of some MCCs located outside of the fire zone. The team of analysts considered the equipment and cables located in the fire zone that could be directly affected by a fire. An assumption was implicitly made and the analyses were performed as if the power and control for each component formed an independent circuit and that a failure of cables for one component would not have any impact on any other safe shutdown components. This assumption is based on breaker coordination studies that demonstrate that fire induced faults on a cable will not cause an upstream supply breaker to open before the specific load fuse or breaker for the circuit in question opens. This assumption would not apply if two MCCs are fed from a single bus breaker.

### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

1. A Daily Order was immediately written to identify and define to Operations the deficiencies reported on 10/12/95 and 10/13/95.
2. Hourly fire watches are in effect in all fire zones impacted and will remain so until permanent corrective actions are taken.
3. Darmatt KM1 fire barrier was installed on some of the conduits and trays containing 1A Diesel Generator cables in the spring of 1995. This installation resolves some of the discrepancies identified in 1993.

4. Criteria for reporting deficiencies in the FPR were established in an October 23, 1995, teleconference between Byron and Braidwood Station Regulatory Assurance and Site Engineering Departments. The criteria will be applied to any future events to establish whether it is reportable.
5. An action plan to assess the FPR Safe Shutdown Analysis (Section 2.4 of the FPR) has been developed and is in progress. The plan is to review all previously identified problems, determine root cause, and recommend corrective actions in order to confirm the technical integrity of the FPR analysis. An initial report of the review and recommended corrective actions has been drafted and is being reviewed. Comprehensive reviews of the Byron FPR Safe Shutdown Analysis are being considered to search for and identify any other unknown discrepancies which may exist. (NTS # 454180950005-03)

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

1. Plant modifications have been initiated to permanently correct each deficiency. The Unit 1 modifications are expected to be installed by May, 1996, and the Unit 2 modifications are expected to be installed by December, 1996. (NTS # 454180950005-01, 454180950005-02)

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance will be achieved by December 1996 when plant modifications to correct each deficiency, for Units 1 and 2, have been completed.



### ATTACHMENT III

#### VIOLATION (454/455-95011-05)

10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in paragraph 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. Also, design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews.

Procedure NEP-12-02, "Preparation, Review, and Approval of Calculations," Revision 1, Section 5.1.3, requires, in part, that detailed design reviews shall consist of a review of the calculation for assumptions, appropriateness of analytical methods and judgement, numerical accuracy, completeness, compliance with design criteria, codes, standards, licensing commitments for the adequacy of the design, and reasonableness of output data.

Contrary to the above:

- a. On March 10, 1995, calculation NED-P-BYR-077, "Minimum Thickness of a Solid Blank to be Installed Between Flanges of the 2FE-SD033 Orifice," Revision 0, did not receive an adequate design review. The review conducted on this calculation failed to identify an incorrect assumption for the system design temperature and the omission of the mechanical allowances factor in the determination of the minimum blank thickness without a technical basis.
- b. On October 31, 1995, calculation BYR95-086 did not verify the adequacy of design for a modification in that the calculation did not adequately determine the maximum differential pressure across the containment sump isolation valves. The calculation failed to account for flow induced line losses due to the operation of Emergency Core Cooling System pumps which would result in a higher maximum differential pressure across the containment sump isolation valves than that calculated.

This is a Severity Level IV violation (Supplement I).  
(50-454/455-95011-05 (DRS))

#### REASON FOR THE VIOLATION

The cause of the non-compliance is that the expectations for calculations were not explicitly stated. The engineering metric system which gives management an assessment of the overall quality of engineering calculations did not reflect the increasing expectations and attention to detail. The errors were a result of not having full access to the design data. The engineer performed a calculation which had already been performed as a result of other programs. These other calculations had a wider purpose and included more items and considerations.

#### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

Site Engineering has taken the following actions:

1. Training was conducted for all engineers performing calculations. This training was a presentation on how to perform a good calculation. Attention to detail and the expectations for reviewers were emphasized. This training was completed January 5, 1996.
2. The Chief Engineers from the corporate office conducted a design review of the calculations listed in the Notice of Violation and others, as part of the Engineering Metrics. These metrics act as a measurement tool for engineering performance. The metrics have been revised to give a better breakout of the comments and provide more information for trending purposes. This review identified several areas where improvements in the performance of calculations could be made. This review was completed January 25, 1996. The results of the chief engineers' review was presented to Site Engineering February 2, 1996. This review provided the engineering supervisors and managers better indications as to the quality of the engineering calculations.
3. The original design calculations for many disciplines are on-site and have been indexed. This indexing provides greater accessibility for the engineer to original design data. A presentation of this system has been given to the engineers to provide an awareness of availability/accessibility of design data.

#### CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

Site Engineering with support of the Chief Engineers will take the following steps to avoid further violations:

1. Calculation NED-P-BYR-077 has been revised and the errors have been corrected. Calculation BYR95-086 has been voided. The containment sump isolation valve pressure differential will be determined in conjunction with the series of calculations being performed for the Generic Letter 89-10 Program. These calculations will be reviewed for applicability and this review will be documented. The calculations for the containment sump isolation valve will be completed by April 1, 1996. (NTS# 454-100-95-01105-01)
2. There will be an assessment of the engineering calculations from 1995 and they will be compared with the calculations performed in 1996. This review will assess the effectiveness of the corrective actions and the relevancy of the metrics. This review will be completed by June 1, 1996. (NTS# 454-100-95-01105-02)

#### DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance will be achieved on April 1, 1996 when the pressure differential calculations review is completed.

#### ATTACHMENT IV

##### VIOLATION (454/455-95011-07)

Technical Specification 6.11 requires, in part, that procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained and adhered to for all operations involving personnel radiation exposure.

Byron Training Procedure BTP 300-5, "Nuclear General Employee Training," (NGET), Revision 8, Section C.5.a, requires, in part, that the initial NGET was required for persons not having current NGET. Section C.5.c requires, in part, that challenge NGET was for persons having current NGET.

COMED Corporate Procedure, "NGET Administration and Course Management Information," Revision 6, section 5.a, requires, in part, that under "urgent circumstances" personnel may be exempted from NGET and be allowed escorted access if the Health Physics Supervisor (HPS) authorizes it. Furthermore, it requires that an NGET card should not be issued when using this option.

Contrary to the above, a contractor, without authorization of the HPS and without a current NGET card, was given a challenge exam on August 30, 1994. The contractor passed the exam and was issued a NGET card.

This is a Severity Level IV violation (Supplement I).  
(50-454/455-95011-07(DRP))

##### REASON FOR THE VIOLATION

The Health Physics Department does have a procedure to issue a waiver for personnel to enter radiologically posted (radiologically controlled) areas prior to attending NGET. BRP 5000-5, Revision 1, Radiation Protection Training for Escorted Visitors, is limited to a maximum of two consecutive days. It is not intended to replace NGET and was designed to be used in "urgent" situations, on a "case by case" basis. The waiver requires approval from the Health Physics Supervisor in situations where the waiver grants access to High Radiation Areas or Contaminated Areas. The Lead HP contacted the Training Department in an effort to satisfy the "intent" of the regulating documents bounding both the NGET training program which is described by BTP 300-5 and the Health Physics Support Department waiver described by BRP 5000-5. The instructor in charge of the NGET program, or Subject Matter Expert (SME), was not notified of this request for training and was not involved in this event until the vendor technician arrived on site.

The current practices for use of "Task Specialists" were not adequately considered in the development of the current revisions of BTP 300-5 and BRP 5000-5. The issue was known to exist prior to the event. There was adequate time to take action to correct the conditions prior to the event. The Corporate Accreditation and Course Management Information (ACMI) document for General Employee Training does provide for an exemption for "Task Specialist" but only under extreme circumstances when unescorted access is required. The Corporate ACMI does not specifically address a situation similar to the conditions surrounding this event even though "Task Specialists" are encountered under similar conditions for each outage at Byron Station.

The Training Department Technical Lead Group Leader allowed perceived pressure to influence his action to promptly grant access to a Radiologically Posted Area (RPA) by a vendor technician. This perceived pressure influenced action contrary to procedure. Personnel were cognizant of the high cost of the vendor technician's services and felt that, considering the vendor technician's previous experience, this high cost warranted special consideration of the access requirements currently in effect. The procedures, BTP 300-5 and BRP 5000-5, do not provide for special considerations.

#### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

1. A cooperative agreement was reached between the Health Physics and Training Departments to issue waivers in cases where work is of short duration. The workers previous training and experience would be taken into consideration in developing necessary training and evaluation on a "case by case" basis. This training and evaluation would be documented and attached to the waiver. Both Health Physics and Training are confident that only adequately trained and qualified personnel will be admitted to the RPA(s) under this agreement.
2. The Training Department Supervisor and Training Department Technical Lead Group Leader reviewed and discussed this event to stress the expectation that procedural compliance or use of formal methods to change procedure is always necessary. Effective teamwork was stressed in resolving emerging issues. In this case, early involvement by the subject matter expert should have speeded resolution of the issues to prevent this event. Task development and tracking of tasks regarding emerging issues should be performed by supervisors to ensure timely completion of actions necessary to prevent conditions which may generate perceived pressure to take actions not permitted by procedure. Subsequently the Training Department Technical Group Leader reviewed this event with the instructors involved to reinforce the issues addressed above.
3. BTP 300-5 was revised to ensure that the program is effective in providing the necessary qualification of personnel accessing Radiologically Posted Areas. These revisions are in compliance with the Production Training Center ACMI as prescribed there in.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATION

No further actions to be taken.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved on 12/14/94 when BTP 300-5, BTP 300-5.1, and BTP 300-5T2 were revised and approved.