



**Commonwealth Edison**  
Dresden Nuclear Power Station  
6500 North Dresden Road  
Morris, Illinois 60450  
Telephone 815/942-2920

September 3, 1993

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Document Control Desk

**Subject:** Dresden Nuclear Power Station Units 2 and 3  
Response to Notice of Violation  
Inspection Report 50-237/92034; 50-249/92034  
NRC Docket Nos. 50-237 and 50-249

- References:** (a) J.A. Zwolinski to M.J. Wallace letter dated  
July 12, 1993
- (b) J.F. Stang to Commonwealth Edison letter dated  
July 22, 1993
- (c) D.L. Farrar letter to Document Control Desk dated  
August 12, 1993

Attached is Commonwealth Edison Company's (CECo) response to the subject Notice of Violation. The violations concern the failure to meet the requirements of 10 CFR 50.59 and the failure to perform an adequate post-modification test.

If your staff has any questions concerning this letter, please refer them to Sara Reece-Koenig, Regulatory Performance Administrator, at (708) 663-7250.

Sincerely,

Michael D. Lyster  
Dresden Site Vice - President

**Attachment:**

**cc:** J.B. Martin, Regional Administrator - Region III  
J.F. Stang, Project Manager, NRR  
M.N. Leach, Senior Resident Inspector, Dresden

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**ATTACHMENT**

**RESPONSE TO NOTICE OF VIOLATION  
NRC INSPECTION REPORT  
50-237/249-92034**

**VIOLATIONS ASSESSED A CIVIL PENALTY:**

10 CFR 50.59, Changes, Tests and Experiments allows a licensee to make changes to the facility as described in the final safety analysis report (FSAR) without prior Commission approval unless the proposed change involves a change in the technical specifications incorporated in the license or an unreviewed safety question. A proposed change is deemed, in part, to involve an unreviewed safety question if the margin of safety as defined in the basis for any technical specification is reduced.

10 CFR 50.59 also requires, in part, that the licensee maintain records of changes in the facility and these records must include a written safety evaluation which provides the bases for the determination that the proposed change does not involve an unreviewed safety question.

FSAR Section 5.2.3.3 (Rev. June 1990), "Containment Characteristics After Reactor Blowdown," stated in part, the long-term pressure and temperature response of the primary containment was analyzed for a minimum of two containment cooling service water (CCSW) pumps available to mitigate the design basis accident (DBA).

FSAR Table 6.2.4.1 (Rev. June 1992), "LPCI/Containment Coolant Equipment Specifications," stated the train heat load was 95 million BTU/hr and the train CCSW flow was 7,000 gpm.

1. Contrary to the above, on December 1, 1992, changes were accepted to the facility as described in the FSAR, reducing the specified (CCSW) train flow below 7000 gpm and the CCSW heat load below 95 million BTU/hr, which involved the following unreviewed safety questions and prior Commission approval was not obtained:
  - (a) Containment overpressure was required to provide adequate emergency core cooling system (ECCS) pump net positive suction head (NPSH). As a result of the change, the margin to safety as defined in the basis for Technical Specification 3.7.A was reduced by now requiring containment pressure to provide adequate NPSH. Specifically, Technical

**ATTACHMENT**

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NRC INSPECTION REPORT  
50-237/249-92034**

Specification Basis 3.7.A stated: "For an initial maximum suppression chamber water temperature of 95°F and assuming the normal complement of containment cooling pumps (2 LPCI pumps and 2 containment cooling service water pumps) containment pressure is not required to maintain adequate net positive suction head (NPSH) for the core spray, LPCI and HPCI pumps."

- (b) Long-term containment pressure was increased above eight psig. As a result of the change, the margin to safety as defined in the basis for Technical Specification 3.5.B was reduced by that increase above eight psig. Specifically, Technical Specification Basis 3.5.B stated: "For the flow specified, the containment long-term pressure is limited to less than eight psig and, therefore, is more than ample to provide the containment heat removal capability."

2. Contrary to the above, on December 1, 1992, the licensee accepted changes to the CCSW, reduction of the train flow below 7,000 gpm and heat load below 95 million BTU/hr, without performing an adequate written safety evaluation to provide the bases that these changes did not constitute an unreviewed safety question. Specifically, the safety evaluation was deficient in the following areas:

- (a) New containment performance and decay heat computer codes were used for the safety evaluation without adequate validation that the codes properly modeled the Dresden Nuclear Station plant configuration. Benchmarking was limited to a comparison with the results of the old codes using different inputs for key parameters.
- (b) Net positive suction head (NPSH) calculations for core cooling pumps were not performed for the most limiting conditions that could occur. Potentially more severe accidents were not considered, flows were not corrected for instrument inaccuracies to provide the most limiting conditions, and the limiting pump (core spray) was not considered in the calculations.

## ATTACHMENT

### RESPONSE TO NOTICE OF VIOLATION NRC INSPECTION REPORT 50-237/249-92034

- (c) Methodologies were employed which resulted in non-conservative conclusions to the NPSH calculations. Specifically, the acceptance criterion for adequate NPSH was defined as being one percent below the vendor specified value.

This is a Severity Level III violation (Supplement I).

#### **ADMISSION OR DENIAL OF THE ALLEGED VIOLATION:**

Commonwealth Edison accepts this violation and the resultant civil penalty.

#### **REASON FOR THE VIOLATION:**

Our actions to resolve the Containment Cooling Service Water (CCSW) event on April 2, 1992 attempted to reconstruct the original design basis of Dresden's Containment Cooling subsystem. The documentation contained in the Safety Analysis Report (SAR), Technical Specification Bases and sister plant documents concerning the configuration of the containment cooling subsystem contained conflicting statements.

Because documentation of the original analytical results for Dresden's design analysis could not be found, decisions were based on our interpretation of SAR statements, knowledge of the analytical results of Dresden's design analyses and the assumptions used, discussion with the NSSS vendor, industry standards on definitions of Design and Safety Margins and industry practice for other plants of the same vintage. These interpretations included determinations on what statements in both the SAR and Technical Specification Bases constituted definitions of the design basis and which were results of the original analyses and equipment specifications. The re-analysis efforts performed to support reconstruction of the design basis were directed toward developing a consistent and conservative analysis, with contemporary methods.

Reconstitution of Design Basis information is an inherently complex undertaking. A questioning attitude and clearly outlined management expectations can lead to a successful design reconstitution.

## **ATTACHMENT**

### **RESPONSE TO NOTICE OF VIOLATION NRC INSPECTION REPORT 50-237/249-92034**

A questioning attitude with clear management expectations was not evident when the methodology and input assumptions were chosen for the CCSW design review, and at the critical decision points in the process review.

The assumptions utilized in various calculations were based on currently available methods. Due to the unavailability of the original inputs for comparison, some inputs may have been less conservative than the original; however, the overall impact of these inputs did not significantly reduce the safety margin. Therefore, the impact on safety was minimal. While the safety significance is considered minimal, the appropriate use of engineering assumptions and judgements is considered a significant issue.

#### **CORRECTIVE ACTIONS:**

Testing performed subsequent to the issuance of the Notice of Violation has demonstrated that flows of 7000 gpm with two pumps are achievable on both the Unit 2 and Unit 3 CCSW systems.

Degraded voltage calculations performed prior to the April 2, 1992 event assumed a 1 Low Pressure Core Injection (LPCI)/ 1 CCSW pump combination. These calculations have been reassessed assuming a 1 LPCI/2 CCSW pump combination, and identified the need for installation of a temporary alteration to ensure adequate CCSW operation under degraded voltage conditions. Installation of this temporary alteration began on September 3, 1993, with expected completion within two shifts.

#### **CORRECTIVE ACTIONS TAKEN TO PREVENT RECURRENCE:**

A license amendment request will be submitted to clarify the containment cooling system design basis configuration as 1 LPCI/1 CCSW pump. Analyses supporting this amendment request will be based on calculational methods, assumptions, conservatisms, and benchmarking consistent with CECo and industry standards.

**ATTACHMENT**

**RESPONSE TO NOTICE OF VIOLATION  
NRC INSPECTION REPORT  
50-237/249-92034**

The existing CECo programs for Design Basis Documents, FSAR Rebaseline, Master Equipment List (MEL) upgrade and the Technical Specification Upgrade will improve the documentation necessary to determine Dresden's Design Basis and allow future decisions on such issues to be made with a minimum of interpretation on the meaning and intent of individual statements. These programs were initiated because CECo understood that the original design basis information for Dresden was incomplete and not well defined.

The Dresden Site Engineering and Construction Group initiated a 10 CFR 50.59 self-assessment review program on July 12, 1993. The program will be used to enhance proficiency in performing 50.59 evaluations, by providing consistent and regular feedback on the quality of the safety evaluation. This program is intended to run through 1994.

Management expectations will be communicated to the staff regarding self-assessment and questioning attitudes by September 24, 1993. These expectations will include direction to utilize the appropriate mechanisms to review designs, engineering assumptions, and engineering judgement.

**DATE WHEN FULL COMPLIANCE WAS ACHIEVED:**

Full compliance was achieved when 7000 gpm CCSW flow was observed on both Units, and after the installation of the September 3, 1993, temporary alteration which addressed the degraded voltage issue.

## ATTACHMENT

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#### II. VIOLATION NOT ASSESSED A CIVIL PENALTY

10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in the applicable design documents.

Contrary to the above, the testing performed to demonstrate the acceptability of modification M12-2/3-82-1, which allowed the Unit 2 Containment Cooling Service Water System (CCSW) pumps to supply cooling to the backup control room ventilation system under accident conditions, failed to demonstrate that the affected systems would perform satisfactorily in service. Specifically, the written test procedure failed to incorporate acceptance limits such as minimum CCSW system discharge pressure and flow rate.

This is a Severity Level IV violation (Supplement I).

#### ADMISSION OR DENIAL OF THE ALLEGED VIOLATION:

Commonwealth Edison agrees with the violation.

#### REASON FOR THE VIOLATION:

This violation was caused by an inadequate system interaction review to assess the impact of the proposed change on the system or related systems performed during the 1985 Modification design and implementation process, as discussed during the enforcement conference on February 22, 1993.

**ATTACHMENT**

**RESPONSE TO NOTICE OF VIOLATION  
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50-237/249-92034**

**CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED:**

Immediate corrective actions initiated upon discovery restored operability of the 2B and 2C CCSW pumps by valving out the Control Room HVAC supply. Special testing of CCSW was completed on November 20, 1992. During the performance of the special test, flow through the CCSW vault coolers and the Control Room HVAC condenser were reduced. This reduction in flow provided for adequate flows at the heat exchangers for the primary CCSW cooling function.

**CORRECTIVE ACTION TAKEN TO PREVENT FURTHER OCCURRENCES:**

Subsequent to the subject modification, long-term corrective actions were implemented to address analysis deficiency issues. ENC-QE-6.2, "Systems Interaction Evaluation for Design Modifications," has been revised and now requires a review of the new operating mode of the system to ensure the system continues to meet its design requirements. This procedure is currently applied to all modifications.

**DATE WHEN FULL COMPLIANCE WAS ACHIEVED:**

Full compliance was achieved on November 20, 1992, when flows through the CCSW vault valves and the Control Room HVAC condenser were adjusted to their design values.