



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351

September 2, 1997

EAs 97-222, 97-223

Mr. John H. Mueller  
Site Vice President  
Zion Generating Station  
Commonwealth Edison Company  
101 Shiloh Boulevard  
Zion, Illinois 60099

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTIES  
- \$330,000 (NRC Augmented Inspection Report 50-295/97006 and Inspection  
Reports 50-295/304-97002 and 50-295/304-97007)

Dear Mr. Mueller:

The NRC conducted three inspections at the Zion Nuclear Power Plant from February 6, 1997, through April 28, 1997. These inspections reviewed several matters, including the reactivity management event that occurred on February 21, 1997, the displacement of reactor coolant from the reactor vessel on March 8, 1997, and the failure to comply with a Technical Specification Limiting Condition for Operation on February 24, 1997. The reports of these inspections were sent to you by letters dated April 29, May 21, and June 4, 1997. Because of the seriousness of the issues evaluated during these inspections, a predecisional enforcement conference was held in the Region III office on July 3, 1997, to discuss the issues.

Based on the information developed during these inspections and the information that was provided during the predecisional enforcement conference, the NRC has determined that several violations of NRC requirements occurred. These violations are cited in the enclosed Notice of Violation and Proposed Imposition of Civil Penalties (Notice) and the circumstances surrounding them are described in detail in the subject inspection reports.

Section I.A of the Notice refers to the reactivity management event of February 21, 1997 in which a licensed reactor operator was assigned a task of reducing reactor power to the point of adding heat and inadvertently made the reactor subcritical. When the operator realized that the reactor was substantially subcritical -- instead of stopping, evaluating, and communicating the unauthorized change in reactivity -- the operator started withdrawing rods to make the reactor critical at the point of adding heat. This activity was observed by a Qualified Nuclear Engineer who expressed some concerns but failed to adequately communicate technical advice for excessive control rod manipulation to shift management. The plant was in the process of shutting down pursuant to Technical Specifications due to an inoperable containment spray pump. Prior to the shutdown, the shift and site management team failed to appropriately plan the shutdown and effectively communicate to the operating staff their expectations for shutting down the reactor. Licensee senior management assumed that Unit 1 was being shut down since the containment spray pump could not be repaired within the Technical Specification allowed outage time. However, management was not

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aware that the shift engineer directed that the unit be kept critical in anticipation of the pump being returned to service. Operations supervision was so focused on pump restoration activities, that appropriate oversight of control rod manipulations was not provided. In addition, the licensee's failure to control the ingress of personnel into the control room resulted in the impairment of the formality and professionalism of control room activities, which contributed to the reactivity management event. During the 8 minutes between tripping the main turbine and tripping the reactor, the same time period during which the primary nuclear station operator excessively manipulated control rods, 39 people were in the control room envelope, with 15 people in the immediate vicinity of the areas where the primary nuclear station operator and unit supervisor were stationed. Accordingly, the violations in this section concern both the direct failure to follow plant operating procedures and the failure to conform with station administrative procedures regarding responsibilities for reactivity control, supervisory oversight of control room activities, requirements for infrequently performed evolutions, maintenance of control room decorum, and proper control room communications. The failure to comply with plant operating and station administrative procedures during a power descent resulted in eight violations of NRC requirements, as discussed in Section I.A of the Notice. Collectively, these violations reflect a breakdown in management oversight and control of operational activities. Accordingly, these violations are classified in the aggregate, in accordance with the "General Statement of Policy and procedure for NRC Enforcement Actions," (Enforcement Policy), NUREG-1600, as a Severity Level III problem.

Section I.B of the Notice addresses the failure to implement effective corrective actions for previous reactivity control problems that had either been documented in the licensee's corrective action system or were the subject of NRC Notices of Violation. In April 1996 and January 1997, the licensee experienced previous reactivity management issues in which inadequate command, control, and communications were identified as causal factors. The NRC issued a Notice of Violation in each instance. Additionally, an internal Zion station memorandum dated February 1996, clearly identified an adverse trend in reactivity management to operations management, and corrective actions were not effectively implemented. The failure to implement effective corrective actions for previous reactivity control problems resulted in three violations of NRC requirements as discussed in section I.B of the Notice. The violations are classified in the aggregate, in accordance with the Enforcement Policy, as a Severity Level III problem.

Section I.C of the Notice addresses the failure to prevent the recurrence of reactor coolant displacement from the reactor vessel caused by undetected gas (primarily nitrogen) accumulation in the Unit 2, and to a lesser extent, Unit 1 reactor coolant systems while the units were in cold shutdown on March 8, 1997. This gas accumulation or voiding is of concern because it presents a threat to the ability to maintain shutdown cooling flow. This topic had been the subject of several generic correspondences and had previously occurred at Zion in September 1996, when Unit 1 was in cold shutdown. Corrective actions to preclude recurrence had been identified, but implementation of necessary procedure changes was deferred. The failure to implement effective corrective action for a previous occurrence of undetected gas accumulation in the reactor coolant resulted in one violation of NRC requirements as discussed in section I.C of the Notice. This violation is classified in accordance with the Enforcement Policy as a Severity Level III violation.

Collectively, the violations are of significant regulatory concern in that several administrative and managerial control systems were ineffective. The violations indicate that several licensee processes and barriers were not used to their fullest potential to permit the early detection and timely resolution of significant performance deficiencies. For example the licensee's line organization had failed to maintain command and control of control room activities during non-routine activities such as the February 21, 1997, plant shutdown and reactivity changes. In addition, the site management team failed to adequately plan activities with the potential for risk significance, and failed to adequately communicate their expectations for shutting down the unit. Lastly, the corrective action system suffered from a noticeable lack of senior management review, oversight, and prioritization which resulted in significant conditions adverse to quality -- such as the precursors to the reactivity management event and reactor coolant displacement by gas -- not being resolved in a timely manner. The NRC's concerns were heightened by continued poor performance in the area of plant operations and in a recent escalated enforcement action<sup>1</sup> caused by ineffective management of plant operation.

The actual safety consequences of these events were low. For the reactivity management event, numerous reactor protection system plant trips were enabled that would have precluded safety limits from being exceeded due to a power excursion. The reactor coolant displacement due to gas accumulation was detected by operators before the capability to remove decay heat was affected. However, the underlying causes for these events could have resulted in events of greater consequence. Had plant operating and administrative procedures been properly implemented and had effective corrective actions for previous precursor and actual events been taken, neither of these events would have occurred and operations personnel would not have been unnecessarily challenged to prevent further degradation of plant conditions. Furthermore, the NRC considers the action taken by your facility management in returning the individuals involved in the reactivity management event to licensed shift duties prior to understanding the causes of the event and prior to the completion of the operators' remediation training, to be a further indication of a lack of management oversight. Therefore, the regulatory significance of the reactivity management event and the coolant displacement event is high.

In accordance with the enforcement policy a base civil penalty of \$55,000 is assessed each Severity Level III violation or problem. The NRC considered whether discretion was warranted to escalate the enforcement sanction in accordance with Section VII.B of the Enforcement Policy. After reviewing the merits of this enforcement action, the NRC has determined that discretion is warranted to double the base civil penalty for the reactivity management and command and control problems (discussed in Section I.A of the Notice) due to particularly poor licensee performance manifested in the poor management oversight of these plant activities. In addition, for the corrective action problem and corrective action

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1 EA 96-216 issued a NOV with Severity Level III Violation with a \$ 50,000 civil penalty for a number of operator errors and unplanned mode changes that occurred from January - June, 1996 time frame.



violation (discussed in Sections I.B and I.C of the Notice), the NRC has determined that discretion is warranted to double the base civil penalty because the violations represent a history of poor past performance in the corrective action area.

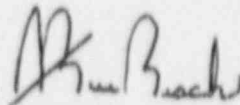
Ineffective or untimely corrective actions at Zion have been the subject of previous enforcement action and have been discussed at a number of management meetings with Commonwealth Edison Company over the past year. For the violations in this case your short term Corrective Actions were only marginally acceptable as demonstrated by the previously detailed failure of the management oversight team to keep crew members involved in the reactivity management event off-shift until they had completed remedial training and the failure to ensure compliance with a Technical Specification action statement. By contrast, your plans for long term Corrective Actions were global in nature and pertained to developing communication skills, enhancing command and control, establishing an organization to preplan activities with the potential to be risk significant and manage the flow of work to the control room, improving the support of engineering organizations to plant operations, resolving plant material condition problems, improving the corrective action system, developing an effective plant oversight group, and the removal of both units from service until the corrective plan can be implemented. However, the inability to implement effective, long-standing corrective actions continues to impact performance at Zion.

Therefore, to emphasize the importance of effective management oversight of plant operations and the importance of timely, effective and lasting corrective actions, I have been authorized, after consultation with the Director, Office of Enforcement and the Deputy Executive Director for Regulatory Effectiveness, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties in the amount of \$110,000 (twice the base) for each of the two Severity Level III problems and the Severity Level III violation described in the Notice. This results in total Civil Penalties of \$330,000.

The violations described in Section II of the Notice discussed three Severity Level IV violations that were not assessed a Civil Penalty. These violations address a less significant failure to comply with the action statement for a Technical Specification Limiting Condition for Operation, the failure to establish upper tier procedures to manage plant activities while a unit was in cold shutdown for an extended period of time, and the failure to make required reports.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be placed in the NRC Public Document Room (PDR).

Sincerely,



A. Bill Beach  
Regional Administrator

Docket Nos: 50-295, 50-304  
License Nos: DPR-39, DPR-48

Enclosure:  
Notice of Violation and Proposed  
Imposition of Civil Penalties

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