

March 26, 1997

PUBLIC

IE-45

EA 96-530  
EA 96-531

Mr. E. Kraft, Site Vice President  
Quad Cities Station  
Commonwealth Edison Company  
22710 206th Avenue North  
Cordova, IL 61242

SUBJECT: QUAD CITIES PRE-DECISIONAL ENFORCEMENT CONFERENCE

Dear Mr. Kraft:

This refers to the meeting conducted at the NRC Region III Office in Lisle, Illinois on February 27, 1997. The meeting was to discuss your actions related to: 1) the identification of degraded control room ventilation system performance at the Quad Cities station, and 2) response to a degraded secondary containment following a severe storm event. These issues are discussed in detail in Inspection Reports 50-254;265/96017 and 50-254;265/96019 respectively, both dated February 4, 1997. The topics discussed at the meeting included our findings and your related corrective actions, both completed and planned.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

We appreciate your cooperation in this matter. If you have any questions regarding this meeting, please contact me at 630/829-9603.

Sincerely,

/s/ P. L. Hiland  
Patrick L. Hiland, Chief  
Reactor Projects Branch 1

Docket No. 50-254  
Docket No. 50-265

Enclosures:

1. Partial List of Attendees
2. Licensee Presentation, ComEd Quad Cities Station, Pre-decisional Enforcement Conference

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cc w/encl: T. J. Maiman, Senior Vice President  
Nuclear Operations Division  
D. A. Sager, Vice President,  
Generation Support  
H. W. Keiser, Chief Nuclear  
Operating Officer  
L. W. Pearce, Station Manager  
C. C. Peterson, Regulatory Affairs  
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I. Johnson, Acting Nuclear  
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Richard Hubbard  
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R. Zimmerman, NRR w/encl

ENCLOSURE 1  
QUAD CITIES PRE-DECISIONAL ENFORCEMENT CONFERENCE  
FEBRUARY 27, 1997  
LIST OF ATTENDEES

Commonwealth Edison (ComEd)

E. S. Kraft, Quad Cities Site Vice President  
L. W. Pearce, Quad Cities Station Manager  
J. J. Hutchinson, Engineering Manager,  
J. R. Garrity, Design Engineering Supervisor  
D. W. Craddick, Quad Cities System Engineering Supervisor

Nuclear Regulatory Commission

A. B. Beach, Regional Administrator, RIII  
J. L. Caldwell, Director, Division of Reactor Projects, RIII  
P. L. Hiland, Chief, Reactor Projects Branch 1, RIII  
C. G. Miller, Dresden Senior Resident Inspector, RIII  
L. L. Collins, Dresden Resident Inspector, RIII  
J. K. Heller, Enforcement Coordinator, RIII  
R. A. Capra, Director, Project Directorate III-2, NRR  
R. M. Pulsifer, Quad Cities Project Manager, NRR

COMED

QUAD CITIES STATION

PREDECISIONAL ENFORCEMENT  
CONFERENCE

FEBRUARY 27, 1997

# AGENDA

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## ■ INTRODUCTION

*Ed Kraft, Jr.*

## ■ CONTROL ROOM EMERGENCY VENTILATION SYSTEM

*Dave Craddick*

- *Overview of General Arrangement*
- *Timeline*
- *Apparent Violations*
  - *Issue, Cause(s), Corrective Actions*
- *Significance*
- *Follow-up Questions*
- *Inspection 97-003 Concerns*

## ■ SECONDARY CONTAINMENT

*John Garrity*

- *Overview of General Arrangement*
- *Timeline*
- *Apparent Violations*
  - *Issue, Cause(s), Corrective Actions*
- *Significance*
- *Follow-up Questions*

## ■ CLOSING REMARKS

*Ed Kraft, Jr.*

# *Quad Cities Station*

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## *CONTROL ROOM EMERGENCY VENTILATION ISSUES*

*DAVID CRADDICK*

*Commonwealth Edison*

*February 27, 1997*

## CONTROL ROOM EMERGENCY VENTILATION SYSTEM CHRONOLOGY

<u>Date</u>	<u>Action</u>
2/83	Modification Letter
4/85 (ISSUE #1)	Post Modification Test
1/89	Initiated CREVS Monthly Surveillance to verify 1/8" Water Gauge Differential Pressure between Control Room and Service Building Hallway
9/07/96	Monthly Surveillance Verified 1/8" Water Gauge Differential Pressure
9/23/96 (ISSUE #2)	Implemented upgraded Technical Specifications
10/08/96	PIF written addressing Dresden identified CREVS concern
10/3 - 10/27/96	Discussions with Dresden and LaSalle
10/28/96	Technical Specification Test failed, Entered LCO, ENS phone call, CREVS Inoperable
10/28 - 11/02/96	Repairs
11/03/96 (ISSUE #3)	Surveillance Test demonstrated 1/8" Water Gauge Differential Pressure, CREVS Declared Operable, Exited LCO
11/13/96 (ISSUE #4)	Engineering noted discrepancy between portable equipment measured flow and installed flow instrument measured flow
11/14/96	Electronic Calibration performed on installed instrument, as-found within Technical Specifications
11/18/96	PIF written documenting instrument question
11/18 - 11/23/96	Toxic Gas Analyzer Inoperable, which prevented air filtration unit operation and measurement of flow to address PIF concern
11/23/96	Toxic Gas declared Operable
11/24/96	Air Filtration Unit Flow Test performed and installed Instrument found to be outside Technical Specifications. Control Room Emergency Filtration System inoperable
11/26/96	Initiated work to restore CREVS to design

## *ISSUE #1*

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- *The modification test in 1985 and subsequent surveillance tests of CREVS failed to ensure that the system would perform as described in the Updated Final Safety Analysis Report (UFSAR)*

# CAUSES

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- *Modification test procedure was less than adequate*
- *Lack of a rigorous modification process in 1985*
- *Inadequate contractor oversight*

# CORRECTIVE ACTIONS

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- Restoring CREVS to conform with design basis requirements
- Review of CREVS surveillances (completed)
- Revised process for specifying post-modification testing requirements (completed)
- Contractor oversight addressed through modification process (completed)

# *CORRECTIVE ACTIONS*

*(continued)*

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- *Revised surveillance procedure (completed)*
- *Implemented design basis reviews of post-modification tests from a sample of 1980-1996 modifications*
- *Established Engineering Assurance Group (completed)*

## *ISSUE #2*

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- *Control Room Emergency Ventilation System (CREVS) was inoperable in excess of the Technical Specification limit*

# CAUSE

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- *Inadequate technical review by Quad Cities Technical Specification Upgrade Project (TSUP) implementation team*

# *CORRECTIVE ACTIONS*

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- Demonstrated 1/8" w.g. differential pressure (completed)
- Revised surveillance procedure (completed)
- Performed review of surveillances associated with TSUP (completed)
- Revising CREVS Technical Specification Basis
- Revising control room habitability study

## ISSUE #3

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- Failure to perform a required 50.59 safety evaluation

# CAUSE

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- *Engineering supervisors believed that seeking a license amendment based upon a new control room habitability study and safety evaluation, as a corrective action, was allowed by G.L.91-18*

# *CORRECTIVE ACTIONS*

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- *Trained Engineering supervisors on conforming to design basis requirements (completed)*
- *Communicated lessons learned via Regulatory Assurance personnel to other ComEd Stations (completed)*
- *Reviewed open operabilities (completed)*

# *CORRECTIVE ACTIONS*

*(continued)*

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- *Revising operability determination procedure clarifying process for evaluating reduced design margin*
- *Issued procedure on how to disposition design basis discrepancies (completed)*
- *Completed design review of top ten risk significant systems (completed)*
- *Trained PORC members on conforming to design basis requirements (completed)*

## ISSUE #4

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- Flow measured during 11/3/96 CREVS surveillance did not satisfy Technical Specifications
- As-found flow was not required to be recorded by procedure

# CAUSE

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- Calibration procedure for Technical Specification flow instrument was less than adequate

# *CORRECTIVE ACTIONS*

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- *Calibrated permanent instrument to reflect actual air flows (completed)*
- *Adjusted system flow rate to satisfy Technical Specification requirement (completed)*
- *Performing reviews of calibrations that support Technical Specifications*

# *CORRECTIVE ACTIONS*

*(continued)*

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- *Revising calibration procedure for Technical Specification flow measurement (RTD) instrument*
- *Revising procedure to record as-found flow*
- *Notified Dresden and LaSalle of issue (completed)*

# *SAFETY SIGNIFICANCE*

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- *No potential impact to health and safety of public*
- *Calculation supports higher allowable inleakage*
- *GDC 19 limits would not have been exceeded for control room operators*

# *RESPONSE TO FOLLOW-UP QUESTIONS*

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- *Ensure equipment testing incorporates design specifications*
  - *Site procedures designate Design Engineer responsible for determining testing and acceptance criteria*
  - *Procedures direct engineer to refer to applicable design documents for testing and acceptance criteria*

# *RESPONSE TO FOLLOW-UP QUESTIONS (continued)*

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- *Ensure equipment testing incorporates design specifications (continued)*
  - *Training program requires engineers to be qualified to develop and perform modification tests*
  - *Multi-discipline reviews of post-modification tests are required for other than standing test procedures*

# *RESPONSE TO FOLLOW-UP QUESTIONS (continued)*

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- *Evaluation of degraded equipment*
  - *PIF documents conditions adverse to safe plant operation*
  - *Shift Engineer reviews for Technical Specification operability*
  - *If needed, Shift Engineer forwards to engineering for further review*
  - *Engineering performs operability assessment and determines conformance to design*

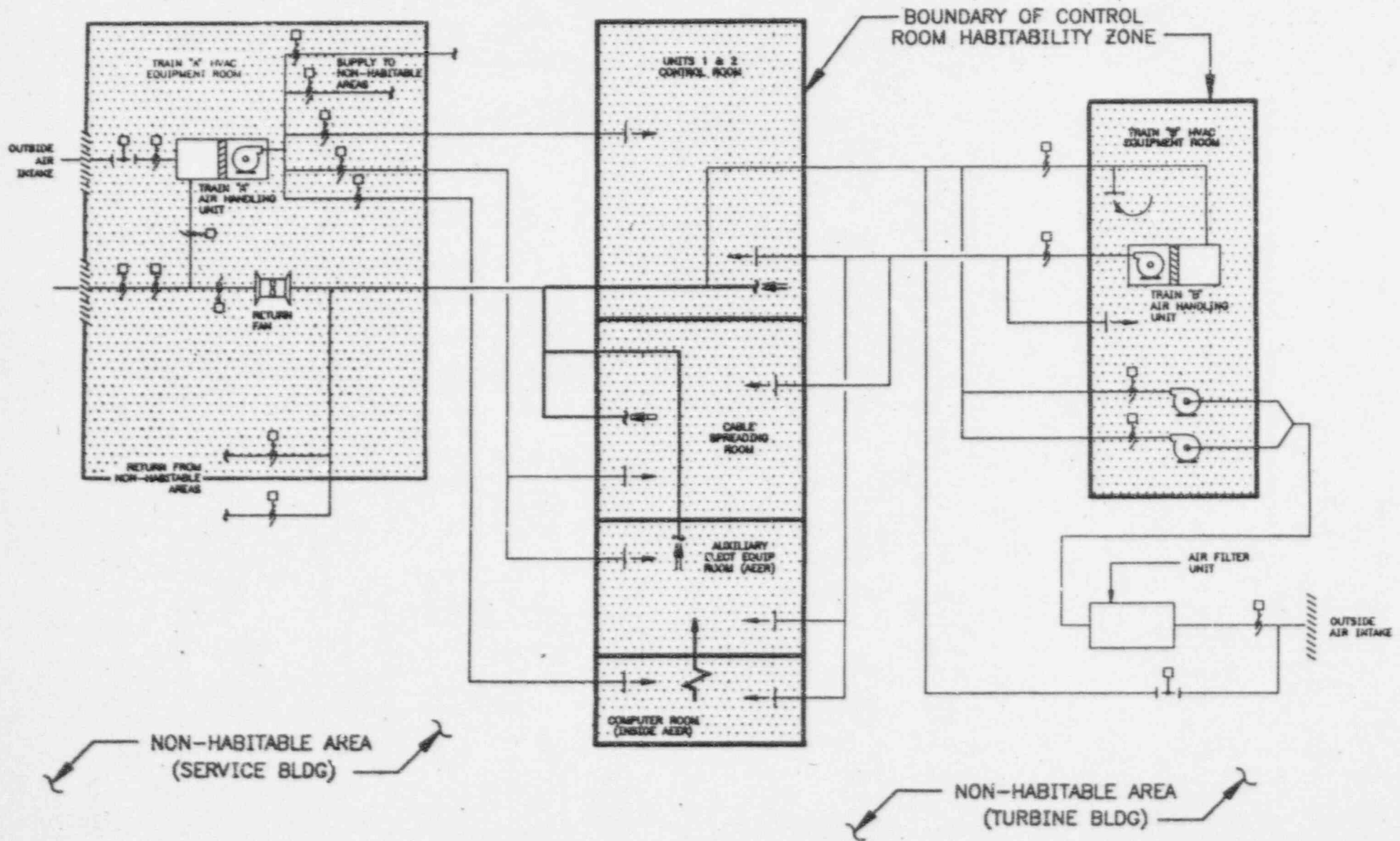
# *RESPONSE TO FOLLOW-UP QUESTIONS (continued)*

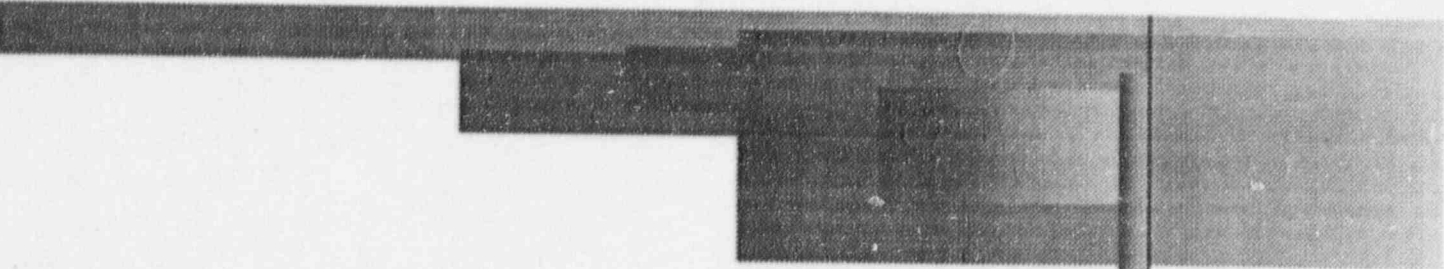
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## ■ *Evaluation of degraded equipment (continued)*

- *If degraded condition exists, engineering dispositions and recommends corrective actions*
- *PORC reviews operability determinations and reviews conformance to design recommendations*
- *Shift Engineer determines operability*

# CONTROL ROOM EMERGENCY VENTILATION SYSTEM





# *Quad Cities Station*

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## *Secondary Containment*

### *Issues*

*John Garrity*

*Commonwealth Edison*

*February 27, 1997*

# *Issues*

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- *The first apparent violation involves the failure to maintain the reactor building blowout panels in accordance with the design basis.*
  - *Damaged blowout bolts existed for extended period of time.*
  - *Pipe and supports were installed without adequate evaluation.*

## *Issues (continued)*

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- *The second apparent violation involves making changes to the facility without an adequate evaluation to determine if an unreviewed safety question existed.*
  - *Damaged bolts and attached pipe supports allowed blowout panels to degrade into non-compliance with design requirements of the UFSAR.*
  - *A 10 CFR 50.59 safety evaluation improperly concluded the secondary containment panel's exterior siding was not an integral part of secondary containment.*

# *Sequence of Events*

## **May 9, 1996**

- Unit 1 -Refueling Outage
- Unit 2 -Operating at Full Power

## **May 10, 1996**

- High winds hit the Quad Cities Nuclear Power Station
- Unit 2 Shutdown

## *Sequence of Events (continued)*

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**May 14, 1996:**

- Quad Cities SQV questioned  
Engineering on the non-safety  
related classification of the reactor  
building blowout panels.

## *Sequence of Events (continued)*

### **May 18, 1996:**

- Station decided to proceed with modification of Unit 2 Corner Room Steel to eliminate operability issues prior to unit startup.

### **May 19, 1996:**

- Degraded voltage issues identified on Unit 2.
- Secondary Containment declared Operable.

## *Sequence of Events (continued)*

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### **May 20, 1996:**

- 10 CFR 50.59 safety evaluation initiated for UFSAR change to clarify outer panel and bolts were not required to meet design basis loads.

### **May 22, 1996:**

- Scheduled completion of Corner Room Steel was June 30, 1996.
- NRC questioned the basis of UFSAR change.

## *Sequence of Events (continued)*

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### **May 23, 1996:**

- Identified Degraded Voltage issue existed on Unit 1 delaying unit startup.

### **May 29, 1996:**

- Calculations to support UFSAR change completed.
- Secondary Containment declared Inoperable. (PIF 96-1955)

## *Sequence of Events (continued)*

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### **July 17, 1996:**

- Secondary Containment declared operable.
- Unit 1 and Unit 2 remain in cold shutdown pending other plant repairs.

# *Damaged Bolts*

## **Issue:**

- Prior to May 10, 1996 no documented inspection of blowout bolts was performed.
- May 10, 1996 inspection identified ~135 broken blowout bolts on various panels.

## *Damaged Bolts (continued)*

### **Issue (continued):**

- May 19, 1996 repairs to bolts on panel N16/17 completed. Secondary Containment tested and declared operable.
- Subsequent inspection of ALL blowout bolts identified additional discrepancies.

## *Damaged Bolts (continued)*

### **Causes for Broken Bolts:**

- Damaged by equipment or personnel.
- Previous high wind events.

## *Damaged Bolts (continued)*

### **Causes for Not Identifying Earlier:**

- No routine inspection.
- Lack of questioning attitude during floor cleaning and wall painting.

## *Damaged Bolts (continued)*

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### **Missed Opportunities:**

- 1975 Architectural/Structural Drawings for Inspection of Blowout Panels.
- During routine housekeeping.
- 1988 painting of inner liner panels.
- May 10, 1996 storm damage inspection.

## *Damaged Bolts (continued)*

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### **Corrective Actions:**

- Repaired damaged bolts.
- Painted warning labels on all blowout panels.
- Incorporated inspection of bolts and panels into surveillances.
- Performed review of 2200 Architectural/Structural Drawings.
- Reconstituted siding calculation.

## *Damaged Bolts (continued)*

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### **Corrective Actions:**

- Personnel who normally work on the refuel floor have been briefed on the importance of the blowout bolts.

### **Safety Significance:**

- Potential Consequences below 10 CFR 100 Limits.
- No actual impact to health and safety of public.

## *Damaged Bolts (continued)*

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### **Safety Significance:**

- PSA model for LOCA combined with a tornado resulted in probability being  $4.8 \text{ E-}8/\text{year}$ .
- We must maintain integrity of the Secondary Containment System.

# *Piping*

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## **Issue:**

- *Installation of piping and hangers to blowout panels failed to conform to plant processes.*

## **Causes:**

- *Failure to follow procedures.*

## *Piping (continued)*

### **Missed Opportunity:**

- Did not recognize design issue on 1994 PIF and Site Engineering Services Request.

### **Corrective Actions:**

- Performed operability determination on piping and blowout panels.
- Issued a modification to remove piping and hangers.

## *Piping (continued)*

### **Corrective Actions (continued):**

- Performing SESR and ER review.
- A screening committee reviews and classifies each AR daily.
- Preparation and control of work packages procedure establishes work analyst contacts engineering when a potential to affect plant design is identified.

## *Piping (continued)*

### **Corrective Actions (continued):**

- Over 300 PIFs generated on plant design discrepancies.

### **Safety Significance:**

- Panels would have performed as designed.
- Configuration of the plant must be maintained.

# *Inadequate 10 CFR 50.59 for UFSAR Change*

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## **Causes:**

- *Informal transfer and acceptance of vendor information.*
- *Lack of Questioning Attitude.*
- *Failure to follow procedures.*

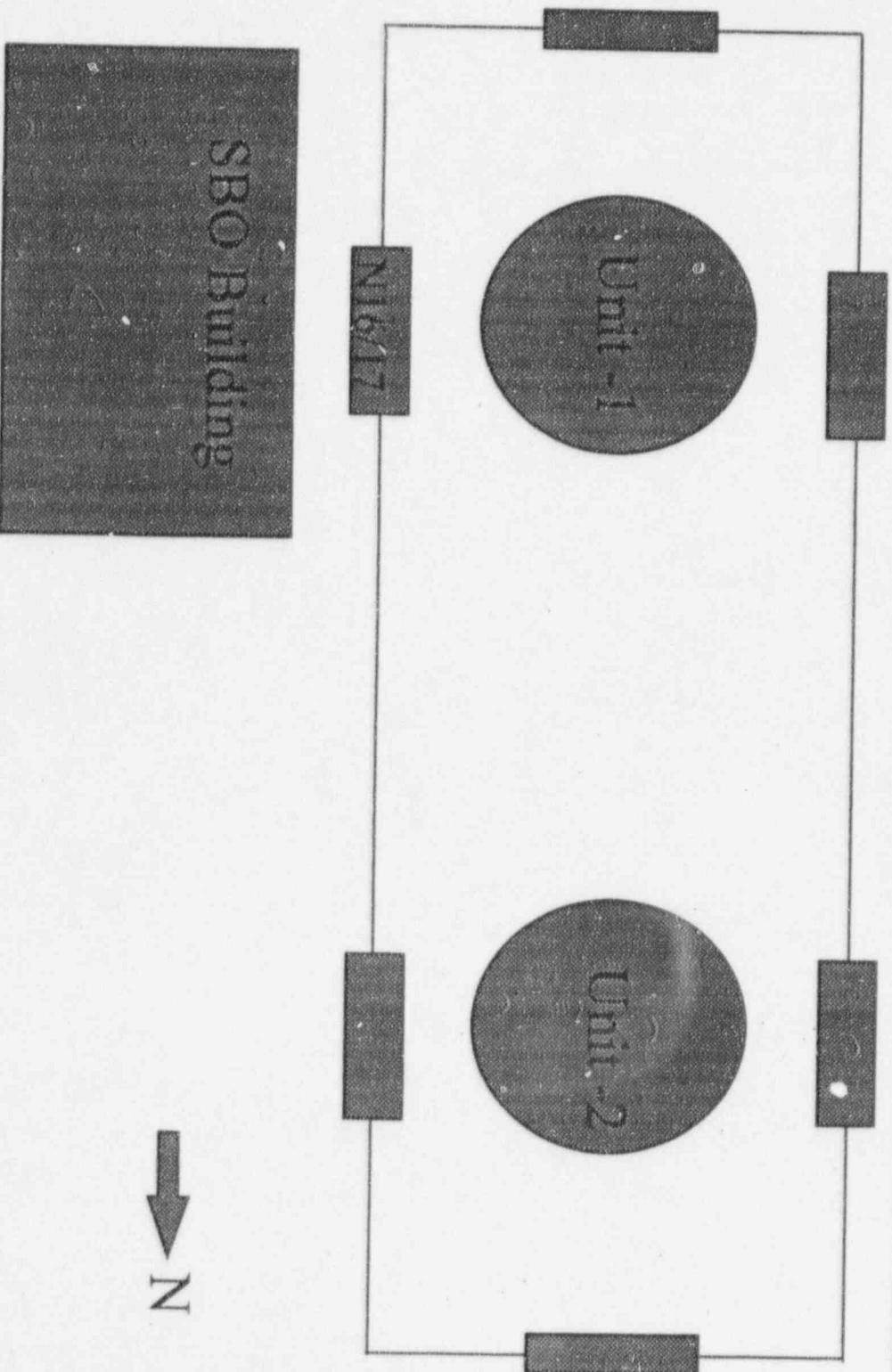
## *Inadequate 10 CFR 50.59 for UF SAR Change (continued)*

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### **Corrective Actions:**

- Prepared 10 CFR 50.59 to reestablish UF SAR requirements.
- Established a third party review of all 10 CFR 50.59s.
- Training.

# *Blowout Panel Locations*



↓ N