

March 27, 1996

LICENSEE: CLEVELAND ELECTRIC ILLUMINATING COMPANY  
FACILITY: PERRY NUCLEAR POWER PLANT, UNIT 1  
SUBJECT: SUMMARY OF MEETING HELD ON FEBRUARY 15, 1996  
TO DISCUSS THE DRYWELL SHIELD DOORS

On February 15, 1996, NRC staff members met at Rockville, Maryland, with employees of Cleveland Electric Illuminating Company (CEI) to discuss the drywell shield doors at the Perry Nuclear Power Plant. A list of attendees is included as Attachment 1.

The licensee made a presentation concerning the drywell shield doors based on the handout included as Attachment 2. They determined that open drywell shield doors during power ascension is an unreviewed safety question, and therefore, they would submit a license amendment for NRC approval of the issue. The NRC staff commented that the licensee should fully review the original design specifications and should use minimal ASME Code allowables for material property values instead of certified test results. Also, the NRC staff asked how much safety margin was there, if you just considered the 2 inch tie rods supporting the doors. The licensee stated that they would consider the comments and question in the development of their license amendment submittal.

Original signed by:  
Jon B. Hopkins, Sr. Project Manager  
Project Directorate III-3  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-440

Attachments: As stated

cc w/atts: See next page

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Unit Nos. 1 and 2

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ATTENDEES

February 15, 1996

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J. Hopkins	NRC
B. Ferrell	CEI
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G. Bagchi	NRC
C. Tan	NRC
S. Lee	NRC
G. Marcus	NRC
J. Powers	CEI
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# **DRYWELL AIRLOCK SHIELD DOORS**

**James J. Powers III**  
Design Engineering Manager

**February 15, 1996**

## **INTRODUCTION**

- **Shield Door Function is Radiation Shielding Only; i.e., ALARA**
- **Drywell Access Required During Power Ascension**
  - **MSIV Yoke Guide Adjustments**
  - **System Boundary Inspections for Leakage**
- **Shield Doors are Steel Plate Structure Filled With Concrete**
  - **Suspended from a Monorail System**
  - **Slide Apart Similar to Closet Doors**

## **INTRODUCTION**

- **Shield Door Suspension Not Evaluated for Dynamic Loads When Open**
- **Need to Evaluate Supported System Operability and Whether Doors are Adequately Restrained**
- **Evaluation Performed for Interim Acceptability**
- **Open Shield Doors During Power Ascension Determined to be a USQ**
- **10CFR50.59c Submittal of a USAR Change Under 10CFR50.90**

## **CHRONOLOGY**

- **Dynamic Load Design Issue Identified at Restart from RFO4**
  - **Condition Report CR 94-1149 Written**
- **Condition Report Interim Acceptability Analysis Completed April 1995**
  - **Guidance from GL 91-18 Applied**
  - **Interim Acceptability Demonstrated**
- **Initial Design Analysis for Doors in Open Position Completed in November 1995**
- **Support Structure Reanalyzed in January 1996**
  - **Interim Acceptability Reconfirmed Using Guidance of GL 91-18**
  - **Acceptance Criteria Established for Long Term**

## **CURRENT ANALYSIS**

- **Shield Door Support System Analyzed Using ANSYS Finite Element Model**
- **Several Members and Connections Stressed Beyond Design Basis Allowables for Design Basis Load Combinations**
- **Functional Acceptance Criteria Developed**
  - **Monorail Suspension System**
  - **Platform Steel**



- **Monorail Suspension Structure Functional Evaluation:**
  - **Structural Integrity (Door Restraint) of Primary Concern**
  - **Load Combinations Involving SRV Were Combined By SRSS**
  - **Allowable Stress for Load Combinations Involving OBE Raised From  $0.6F_y$  to  $F_y$**
  - **Pool Swell Loads Not Concurrent With SSE**
  - **Limited Structural Energy Absorption Considered by Use of Inelastic Response Spectra**
  - **Only 90% of Plastic Section Modulus Applied**
  - **Maximum Principal Strain Limited to 20% Ultimate Strain**
- **Acceptance Criteria Met**

- **Platform Functional Evaluation:**
  - **Continued Support of SSCs of Primary Concern**
  - **Design Basis Load Combinations Applied**
  - **Allowable Stress Increased From  $0.6F_y$  to  $F_y$** 
    - **Operating Load Case:  $D + SRV_1 + OBE$**
- **Acceptance Criteria Met**

- **Conservatisms Supporting Functionality:**
  - **Conservative Design Basis Hydrodynamic Spectra Used**
  - **Analyses Conducted as Equivalent Static Linear Elastic; No Non-Linear Time History Applied**
  - **No Components Which Would Exhibit a Brittle Failure Mode**
  - **Isolated Application of Maximum Strain Criteria**

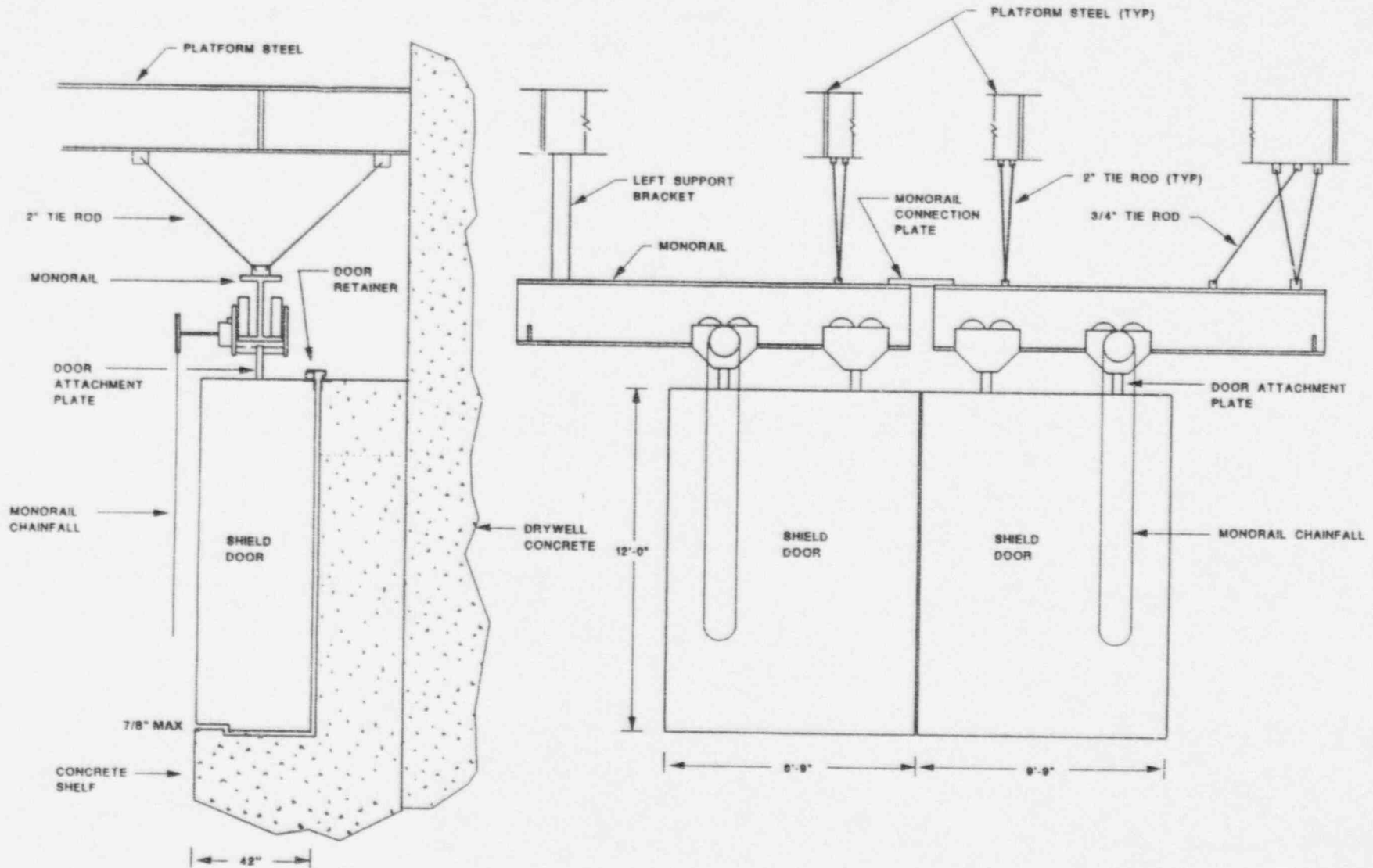
## **SCHEDULE FOR RESOLUTION**

- **NRC Approval Required Prior to Power Ascension Mode 2**
- **10CFR50.90 Submittal Planned February 21, 1996**
- **Mode 2 Currently Scheduled for March 25, 1996**

## **CONCLUSIONS**

- **Guidance of Generic Letter 91-18 Used for Interim Acceptability**
- **Shield Doors in the Open Position Beyond RFO5 Considered Acceptable Based On:**
  - a) **Limited Strain Deformation of Support System During Postulated Design Basis Dynamic Loads,**
  - b) **Functionality of Shield Door Support System Maintained,**
  - c) **Concrete Shelf and Platform Support Steel Beneath Shield Doors Limit Vertical Movement of Doors.**

## DRYWELL AIRLOCK SHIELD DOORS



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