NOTICE OF VIOLATION

Carolina Power & Light Company
Brunswick Unit 1

Docket No. 50-325
License No. DPR-71
EA 95-166

During NRC inspections conducted between April 29 and August 10, 1995, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (60 FR 34381; June 30, 1995/NUREG-1600), the violations are listed below:

A. 10 CFR 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 are correctly translated into specifications and instructions. Criterion III also requires, in part, that design control measures shall provide for verifying or checking the adequacy of design such as by design reviews or by the performance of a suitable testing program.

Contrary to the above, measures were not established to assure that applicable regulatory requirements and the design basis were correctly translated into specifications and instructions for Plant Modification 92-79, High Pressure Coolant Injection/Reactor Core Isolation Cooling Inverter and Flow Controller Replacement, in that:

1. The design review for plant modification 92-79 did not adequately isolate DC power supplying the flow control loop from direct current grounds as evidenced from June 8-10, 1995, when high pressure coolant injection was declared inoperable due to a direct current ground causing erroneous speed and flow indications during a routine operability test.

2. The post-modification testing for plant modification 92-79 did not assure that the flow controller was adjusted for high pressure coolant injection to the vessel. Specifically, on May 18, 1995 tuning of the flow controller was conducted under recirculation conditions and did not account for the different hydrodynamic conditions of vessel injection. (01013)

B. Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, November 1972. Regulatory Guide 1.33, November 1992, Appendix A, requires, in part, specific procedures for testing of the Reactor Core Isolation Cooling (RCIC) system.

Modification Administrative Procedure, 0-MAP-005, Implementation of Major Modifications, implements Technical Specification 6.8.1 requirements. 0-MAP-005, Revision 4, Section 5.5.3.4.a.1, requires that Post-modification Testing shall ensure that modified systems,

Enclosure 1

structures, and components are functional and operate as designed under analyzed conditions.

Contrary to the above, the post-modification testing of Plant Modification 92-79, High Pressure Coolant Injection/Reactor Core Isolation Cooling Inverter and Flow Controller Replacement, which was implemented under Work Request/Job Orders 94-ALXT7 and 94-ALXTF did not ensure that the modified systems, structures, and components were functional and would operate as designed under analyzed plant conditions, as demonstrated by the failure of the RCIC system flow controller to control flow when actuated in the automatic mode of operation on May 19, 1995, following a Unit 1 reactor trip. Flow controller adjustments for RCIC did not account for the different hydrodynamic conditions of vessel injection. (01023)

These violations represent a Severity Level III problem (Supplement I). This violation is applicable to Unit 1 only.

Pursuant to the provisions of 10 CFR 2.201, Carolina Power & Light Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. However, if you find it necessary to include such information, you should clearly indicate the specific information that you desire not to be placed in the PDR, and provide the legal basis to support your request for withholding the information from the public.

Dated at Atlanta, Georgia
this day of September 1995

LIST OF ATTENDEES

Carolina Power & Light Company

W. Campbell, Vice President, Nuclear Engineering
H. Habermeyer, Vice President, Nuclear Services and Environmental Support
R. Lopriore, Manager, Brunswick Engineering Support Services
R. Rogan, Manager, Regulatory Affairs & Licensing, CP&L
G. Hicks, Manager, Regulatory Affairs, Brunswick Nuclear Plant
D. Berry, Electrical System Engineer
H. Pitts, Manager, Instrumentation/Control & Electrical Systems
R. Williams, Manager, Design Review
R. Mullis, Assistant to Vice President

Nuclear Regulatory Commission

L. Reyes, Deputy Regional Administrator, Region II
E. Merschoff, Director, Division of Reactor Projects (DRP)
C. Casto, Branch Chief, Engineering, Division of Reactor Safety
B. Uryc, Director, Enforcement and Investigation Coordination Staff
D. Verrelli, Branch Chief, Reactor Projects Branch 1A, DRP
D. Trimble, Project Manager, Office of Nuclear Reactor Regulation (NRR)
P. Milano, Project Manager, NRR
C. Patterson, Senior Resident Inspector, Brunswick Nuclear Plant
B. Fewell, Acting Regional Attorney
L. Watson, Senior Enforcement Specialist
B. Pharr, Project Engineer, DRP
J. Starefos, Project Engineer, DRP
M. Satorius, Enforcement Coordinator, Office of Enforcement

Enclosure 2

ENFORCEMENT CONFERENCE AGENDA
U. S. NUCLEAR REGULATORY COMMISSION

AND

CAROLINA POWER AND LIGHT COMPANY
AUGUST 28, 1995; 1:00 PM

I. INTRODUCTION AND OPENING REMARKS
L. Reyes, Deputy Regional Administrator

II. DISCUSSION OF THE ENFORCEMENT POLICY
B. Uryc, Director
Enforcement and Investigation Coordination Staff

III. OVERVIEW
L. Reyes, Deputy Regional Administrator

IV. EXAMPLES OF APPARENT VIOLATIONS AND NRC CONCERNS
E. Merschoff, Director
Division of Reactor Projects

V. LICENSEE PRESENTATION
W. Campbell, Vice President
Brunswick Steam Electric Plant

VI. BREAK/NRC CAUCUS

VII. NRC FOLLOWUP QUESTIONS

VIII. CLOSING
L. Reyes, Deputy Regional Administrator

Enclosure 3

STATEMENT OF CONCERNS / APPARENT VIOLATIONS

Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, November 1972. Regulatory Guide 1.33, November 1992, Appendix A, requires, in part, that specific procedures for Reactor Core Isolation Cooling (RCIC) tests.

Modification Administrative Procedure, 0-MAP-005, Implementation of Major Modifications, implements these requirements. 0-MAP-005, Revision 4, Section 5.5.3.4.a.1, requires that Post-modification Testing shall ensure that modified systems, structures, and components are functional and operate as designed under analyzed conditions. The post-modification testing of Plant Modification 92-79, High Pressure Coolant Injection Inverter and Flow Controller Replacement, was implemented under Work Request/Job Orders 94-ALXT7 and 94-ALXTF.

The post-modification testing did not ensure that the modified systems, structures, and components were functional and would operate as designed under analyzed plant conditions, as demonstrated by the failure of the RCIC system flow controller to control flow when actuated in the automatic mode of operation on May 19, 1995, following a Unit 1 reactor trip. Flow controller adjustments for RCIC did not account for the different hydrodynamic conditions of vessel injection.

NOTE: The apparent violation discussed in this enforcement conference are subject to further review and are subject to change prior to any resulting enforcement decision.

STATEMENT OF CONCERNS / APPARENT VIOLATIONS

10 CFR 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 are correctly translated into specifications and instructions. Criterion III also requires, in part, that design control measures shall also provide for verifying or checking the adequacy of design such as by design reviews or by the performance of a suitable testing program.

Measures were not established to assure that applicable regulatory requirements and the design basis were correctly translated into specifications and instructions for the Plant Modification 92-79, High Pressure Coolant injection Inverter and Flow Controiler Replacement:

1. The post-modification testing for Plant Modification 92-79 did not assure that the modified systems, structures, and components were functional and would operate as designed under analyzed plant conditions. Specifically, flow controller adjustments for high pressure coolant injection did not account for the different hydrodynamic conditions of vessel injection.

2.The design review for Plant Modification 92-79 modification did not adequately isolate the DC power supply from the flow control loop as evidenced from June 8-10, 1995, when high pressure coolant injection was declared inoperable due to a direct current ground causing erroneous speed and flow indications in the control room during a routine operability test.

NOTE: The apparent violation discussed in this enforcement conference are subject to further review and are subject to change prior to any resulting enforcement decision.

Brunswick Nuclear Plant
Predecisional Enforcement Conference
HPCI/RCIC Flow Controllers

Presented To The NRC
August 28, 1995

CP&L

Enclosure 4

Agenda

- Introduction
- Background
- RCIC/HPCI Flow Controller Tuning
- HPCI Ground
- Engineering Overview

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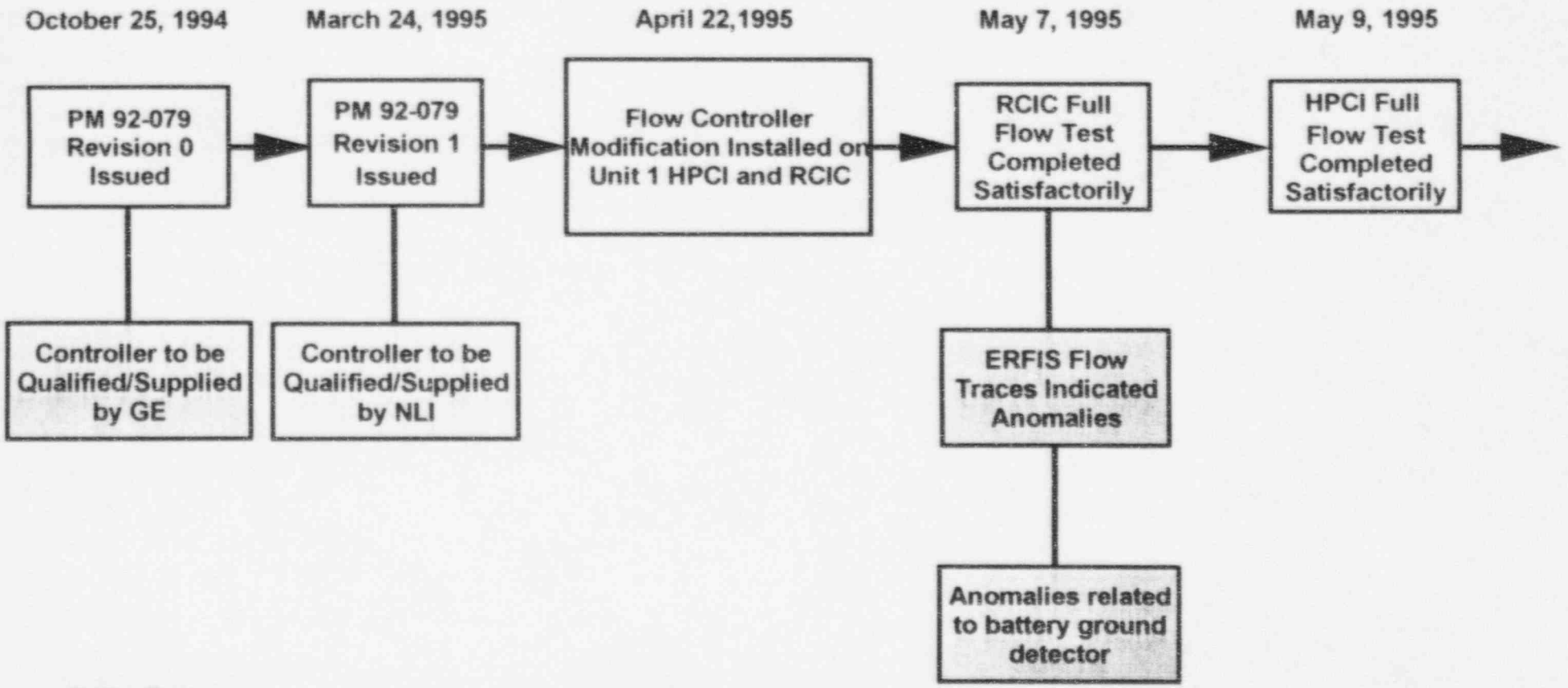
Background

Flow Controller Modification



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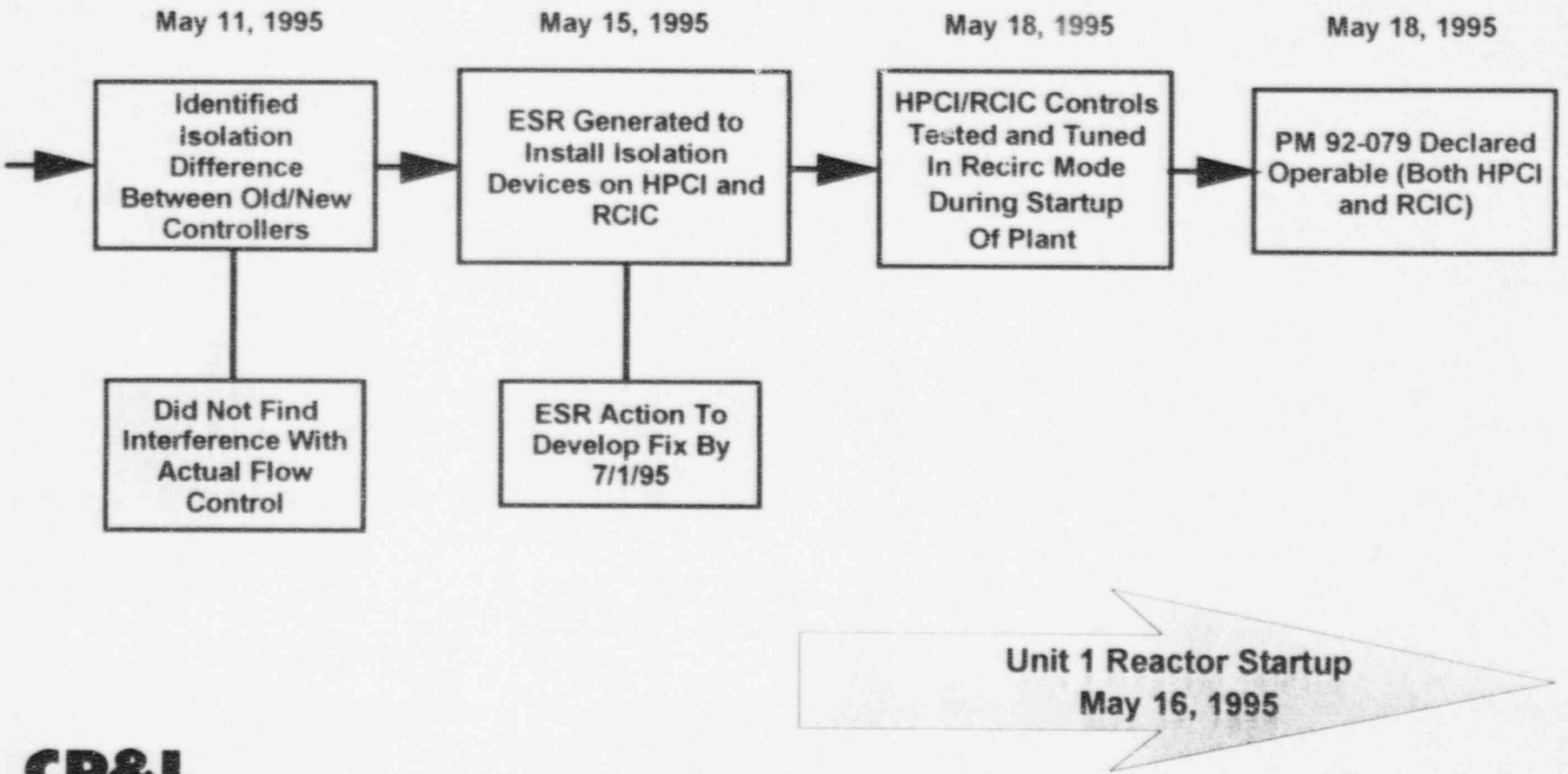
Background

Flow Controller Modification



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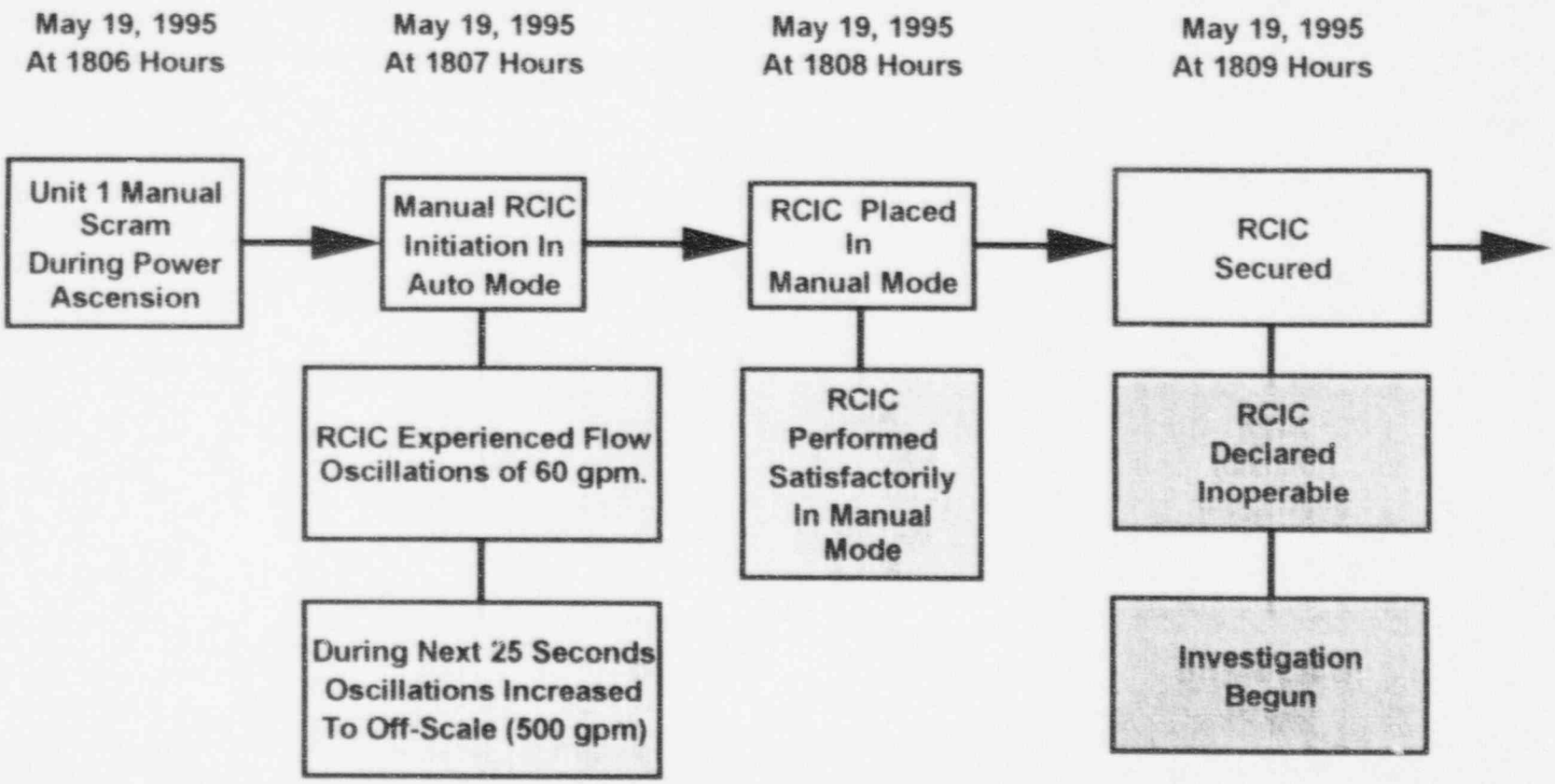
RCIC Flow Controller Event

Timeline



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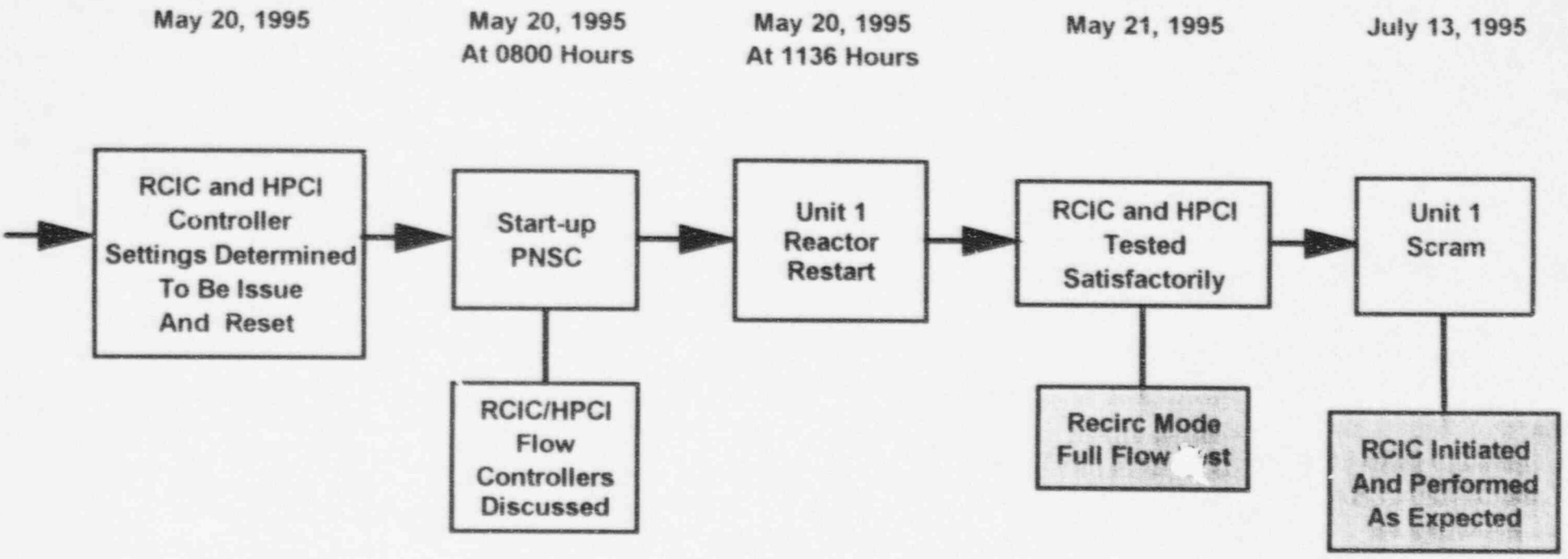
RCIC Flow Controller Event

Timeline



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RCIC Flow Controller Event

Root Cause and Causal Factors

- **Root Cause: Inadequate Post-Mod Acceptance Testing**
- **Causal Factor: Programmatic Issues**
  - Process Hand-offs
  - Engineering Ownership/Accountability
  - Design Validation of Acceptance Testing
- **Causal Factor: Communications**

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RCIC Flow Controller Event

Corrective Actions

- Equipment Related
  - HPCI/RCIC Flow Controllers Reset to Established Settings
  - HPCI Past Operability Validated
  - RCIC and HPCI: Full Flow Tests Performed / Returned to Service
- Modification Process Related
  - Design Engineer Expectation: Review Mod Acceptance Tests and Results
  - Engineering Product Review Team
  - Engineering Design Review Team

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RCIC Flow Controller Event

Safety Significance

- Increase in Risk From This Event Was Not Significant
- RCIC Was Available in Manual Control Mode
- HPCI Controller Remained Operable
- Operators Are Trained to Use Manual Mode of RCIC Following Malfunction of Automatic Mode
- All ECCS Systems Were Available

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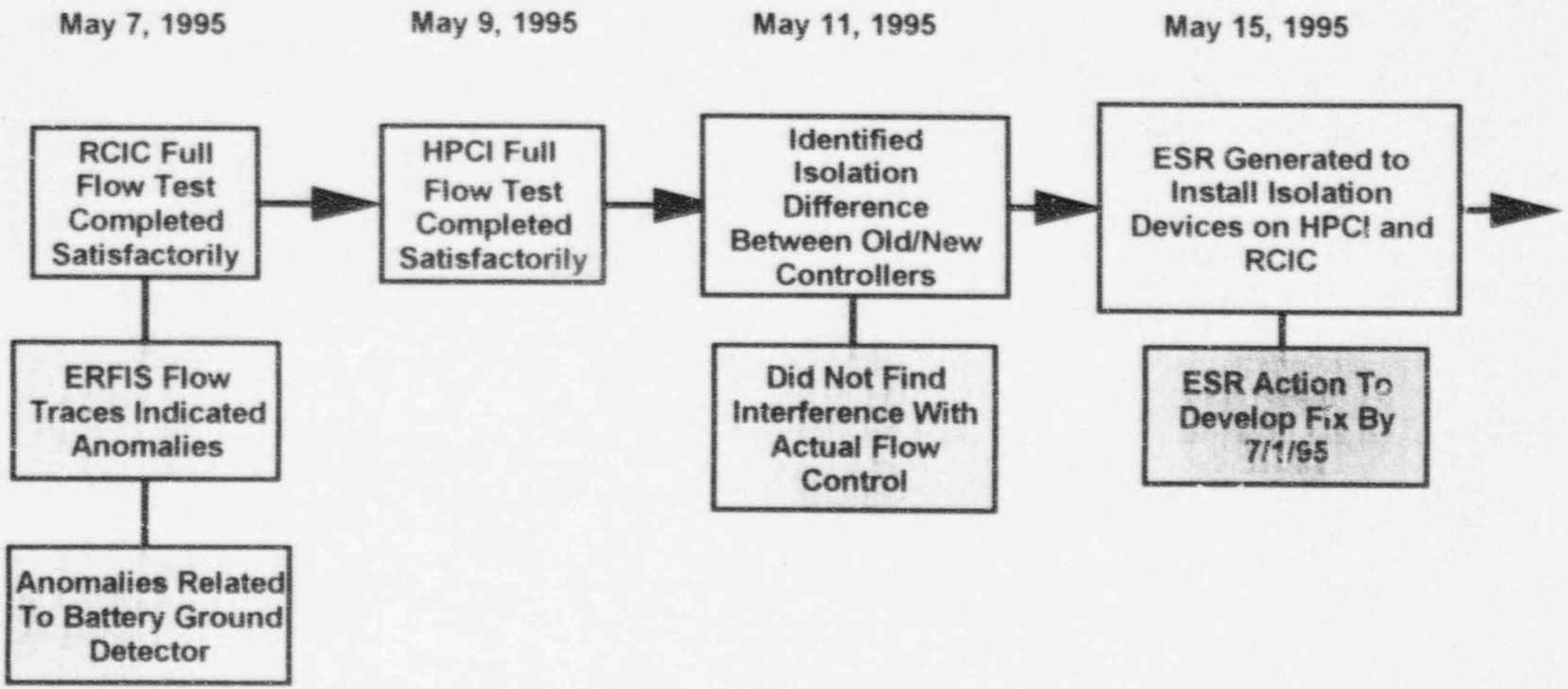
HPCI Ground Event

Timeline



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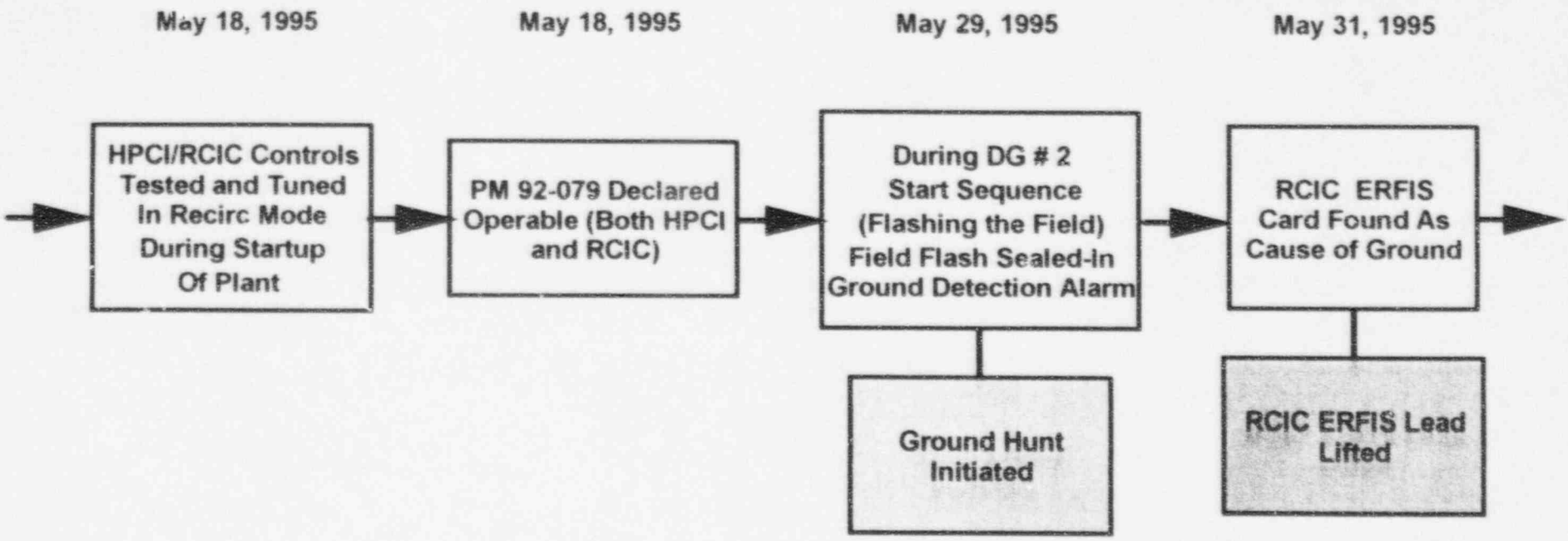
HPCI Ground Event

Timeline



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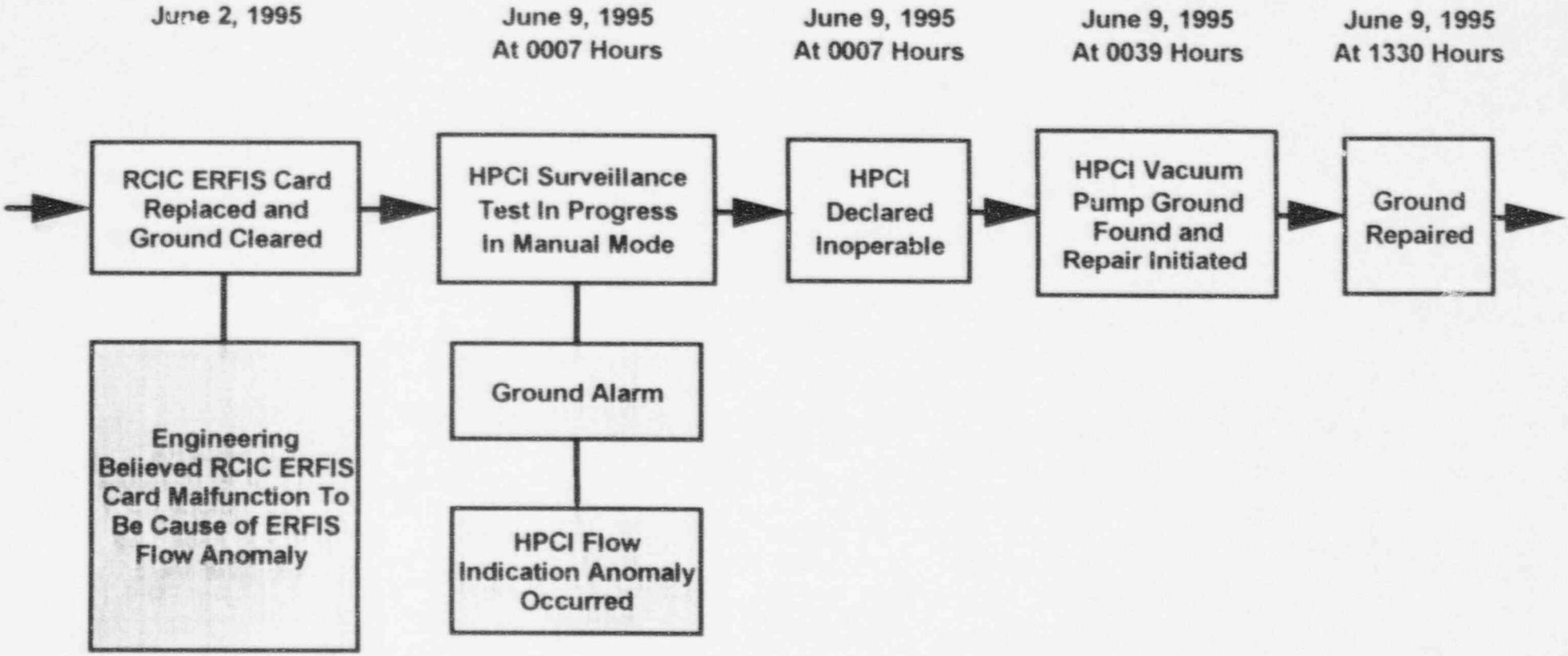
HPCI Ground Event

Timeline



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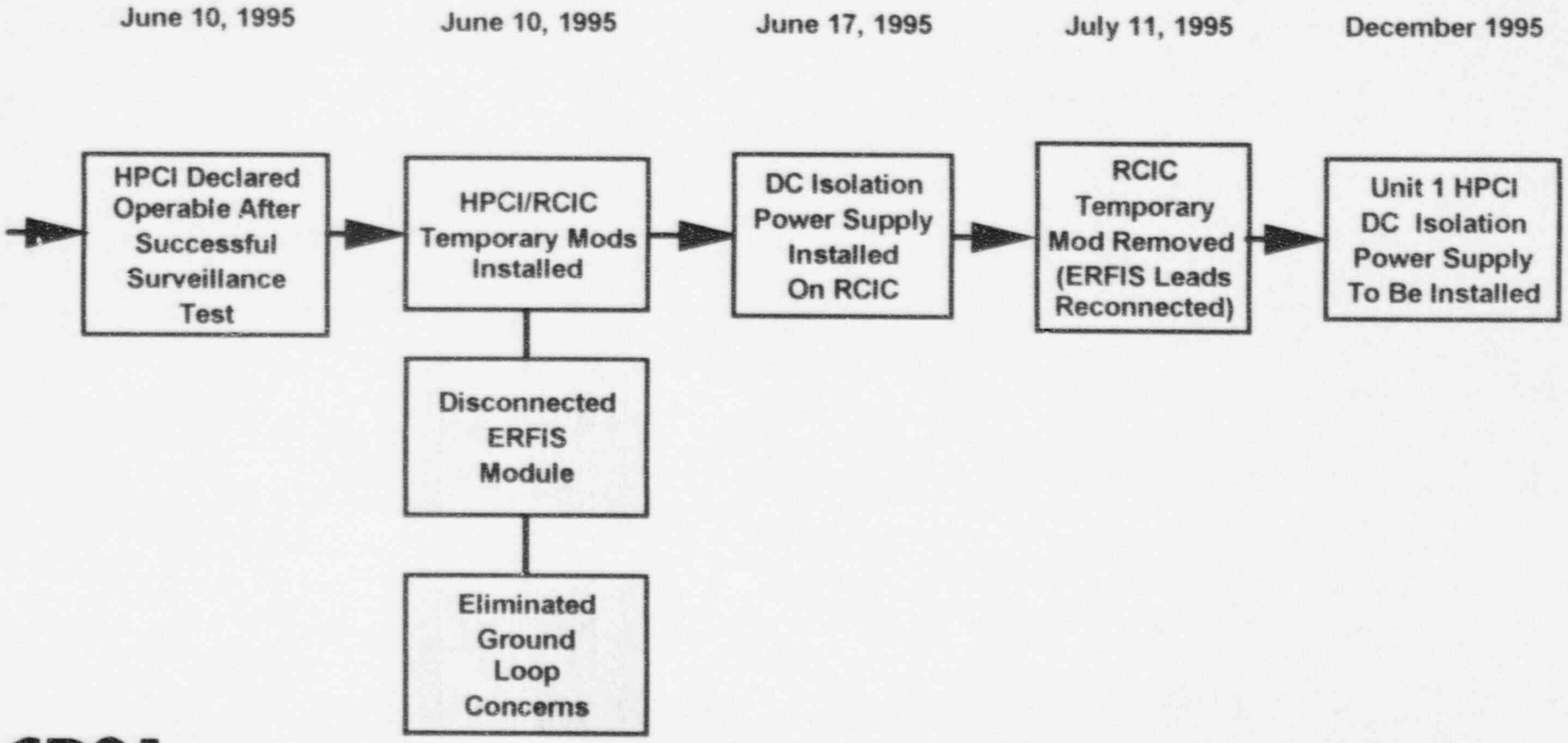
HPCI Ground Event

Timeline



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HPCI Ground Event

Root Cause and Causal Factors

- Root Cause: Isolation of Controller Inputs/Outputs Not Identified as Critical Design Characteristic
- Causal Factor: Human Performance

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HPCI Ground Event

Safety Significance

- Increase in Risk From This Event Was Not Significant
- HPCI Was Available in Manual Control Mode
- RCIC Remained Operable
- Condition Found During Routine Surveillance
- Operators Are Trained to Use Manual Mode of HPCI Following Malfunction of Automatic Mode
- Redundancy Maintained (ADS, Core Spray, RHR Remained Operable)

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HPCI Ground Event

Corrective Actions

- **Equipment Related**
  - Temporary Modification
  - HPCI/RCIC Auxiliary Pump Inspections
  - Ground Impact on HPCI Evaluated
  - Install Isolation Devices on HPCI/RCIC Flow Controllers
- **Performance Related**
  - Reinforce Need to Fully Evaluate Off-Normal Indications/Observations
  - Identified/Reviewed Other DC Battery Bus-Powered Control Systems
  - Review Complexity of DC Controller Ground Protection with I&C/Electrical Engineers to Heighten Sensitivity
  - Revise DBDs to Ensure Isolation of Control Systems Powered from DC Battery Buses is Maintained

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Engineering Overview

Engineering Product Improvement Initiatives

- **Integration of Design and System Engineering**
  - Improved Communication
  - Consistent Management Oversight and Expectations
- **Formation of Engineering Review Teams**
  - Design Review Team
  - Product Review Team (BNP)

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Engineering Overview

Engineering Product Improvement Initiatives

- **Enhancement of Engineering Skill Sets**
  - ESP Training
  - Augmented System Training (MOST, SRO Certification)
  - Rotation of Engineering Personnel / Individual Development Plans
- **Proceduralize Project Management Manual**
  - Instill "Responsible Engineer" Concept
- **ESR Phase II Re-Design**
  - Instill "Responsible Engineer" Concept

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J. Johnson reviewed 09/06/95
Minor changes NO CONC REQ

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