

# NRC INDIAN POINT UNIT TWO AUGMENTED INSPECTION TEAM EXIT MEETING

Inspection Report 50-247/2000-02  
March 29, 2000

8/X

EXHIBIT  
Root Cause  
Analysis  
B4  
INVESTIGATION  
CONCERN

Release

# AGENDA

- Introduction and Background - L. Doerflein, Team Manager
- Preliminary Findings - R. Lorson, Team Leader
- Consolidated Edison Comments - J. Groth, Chief Nuclear Officer, ConEd
- Concluding Remarks - W. Lanning, Director, Division of of Reactor Safety, Region I

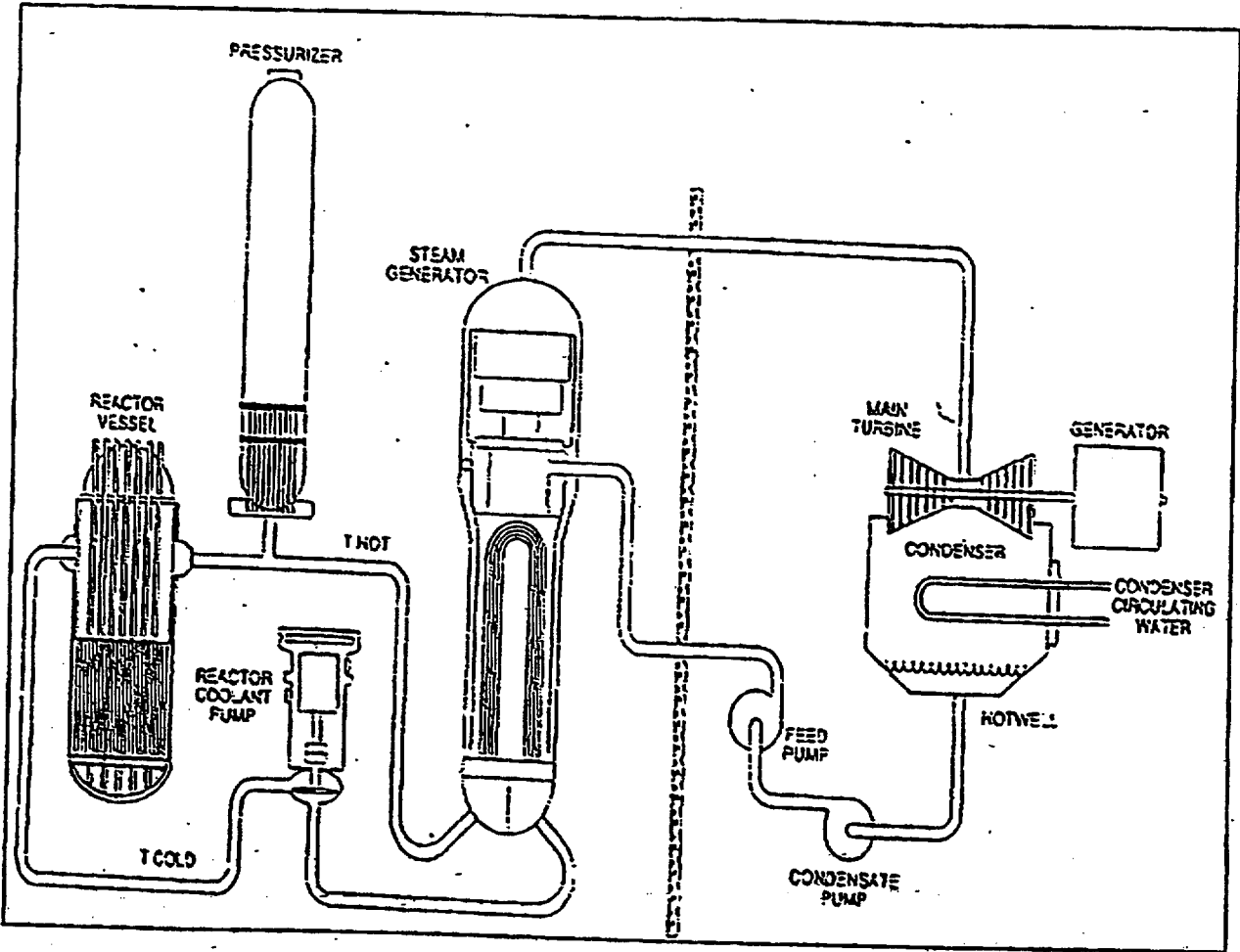
# INTRODUCTION AND BACKGROUND

- Establishment of the Augmented Inspection Team (AIT)
- Purpose of an AIT
- Review of Team Charter, Including Team Membership
  - Cause of the Steam Generator (SG) Tube Failure - Separate NRC Review

# AIT TEAM CHARTER

- Develop Sequence of Events
- Review Operator Performance
- Review Equipment Performance
- Plant Risk
- Radiological Assessment
- Emergency Response Organization
- Review SG History
  - Cause of Tube Failure Under Separate NRC Review

# SYSTEM DIAGRAM



# OVERVIEW

- Initial Response Prompt/Appropriate
- No Offsite Radiological Impact
- Licensee Successful in Achieving Cold Shutdown
- Several Operator Performance/Procedural/Equipment Issues Identified Which Delayed Achieving Cold Shutdown Conditions
- Several Emergency Response Problems
- No Impact on Public Health and Safety

# AIT FINDINGS

- Sequence of Events
- Steam Generator Monitoring
- Operator Performance
- Procedure Quality
- Equipment Performance
- Emergency Response
- Radiological Assessment
- Safety Significance

# SEQUENCE OF EVENTS

## February 15, 2000

- 7:17 p.m. -- Operators Identified Increased SG Leak
- 7:29 p.m. -- Declared Alert
- 7:30 p.m. -- Tripped Reactor
- 7:41 p.m. -- State/County Officials Notified
- 8:31 p.m. -- Isolated Affected SG
- 9:02 p.m. -- Operators Initiated Plant Cooldown
- 9:04 p.m. -- Manually Initiated Safety Injection
- 11:38 p.m. -- Tube Leak Stopped

## February 16, 2000

- 12:39 p.m. -- Shutdown Cooling System
- 4:57 p.m. -- Achieved Cold Shutdown
- 6:50 p.m. -- Terminated Alert



# STEAM GENERATOR MONITORING

- SG Tube Leakage Monitored During Cycle
- Pre-Event Leak Monitoring Actions Appropriate
  - Shift Monitoring of Tube Leakage
  - Operator Review of Tube Leak Procedure
- Secondary Chemistry Acceptable

# OPERATOR PERFORMANCE

- Initial Response Prompt and Appropriate; Procedure Adherence  
Good Overall

- Some Deficiencies in the Plant Cooldown Phase

- Initial Cooldown Excessive
- Operator Recognition of Plant Configuration

# PROCEDURE QUALITY

- Procedures (AOPs/EOPs) to Guide Initial Response were Good
- Several Procedural Deficiencies Challenged Operators During the Plant Cooldown Phase
  - Delayed Placing Shutdown Cooling In-Service
  - System Configuration
  - Shutdown Conditions

# EQUIPMENT PERFORMANCE

## ■ Event Mitigation Systems Worked Properly

- Reactor Protection System
- Auxiliary Feedwater System
- Safety Injection System

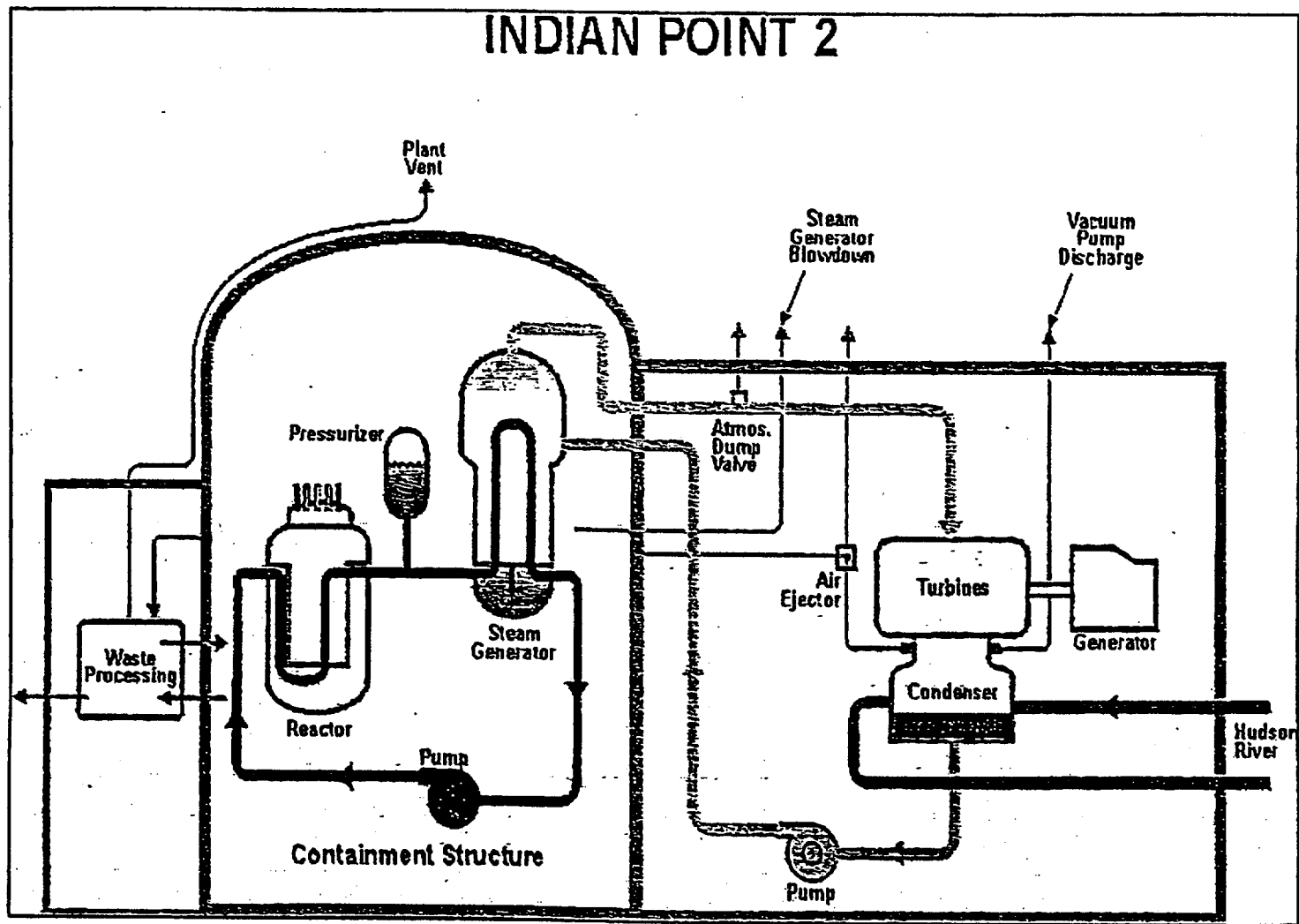
## ■ Some Pre-existing Equipment Problems Challenged Operators

- ● SG Leak Rate Trend Recorder
- ● Automatic Condenser Vacuum Control Valve
- ● Condenser Mechanical Vacuum Pump
- ● Containment Valve Seal Water System Design Problem →
- ● Pressurizer Power Operated Relief Valve Design Problem →

# EMERGENCY RESPONSE

- Emergency Response Protected Health and Safety of Public
- Event Classified Properly/Good Critique of Emergency Response
- Emergency Plan/Implementing Procedure Problems
  - Augmented Emergency Response Facility Staffing Not Timely
  - Accountability Problems
  - Emergency Response Data System (ERDS) not Operable for Several Hours (Pre-Existing Problem)
  - Problems in Implementation of the Media Response Plan
  - Emergency Response Facility Equipment Problems
  - Technical Support Timeliness and Quality Issues

# RADIOLOGICAL RELEASE PATHS



# RADIOLOGICAL ASSESSMENT

- Off-site Monitoring Good
- No Radioactivity Detected
- Conclusion - No Radiological Impact

# POTENTIAL RADIOLOGICAL EFFECT

- Conservative; Bounding Calculation
- Any Releases Small Fraction of Allowable Limits

	<u>Calculated Event Release</u>	<u>Background</u>	<u>Licensee Limit</u>	<u>% of Licensee Limit</u>
Gas	~.01 mrem	~ 300 - 400 mrem/year	10 mrem/yr (Total Body Gamma Air Dose)	0.1%
Liquid	~.0009 mrem		3 mrem/yr (Total Body)	0.03%



# SAFETY SIGNIFICANCE

## ■ Event Consequences

- No Measurable Radioactivity Offsite Above Normal Background
- There were no Consequences to Public Health and Safety

## ■ Risk Perspective

- Analyzed to Determine Necessary Licensee and NRC Response
- Some Increase in Calculated Risk