Plant Performance Update Meeting

May 2, 2000

Enclosure 2

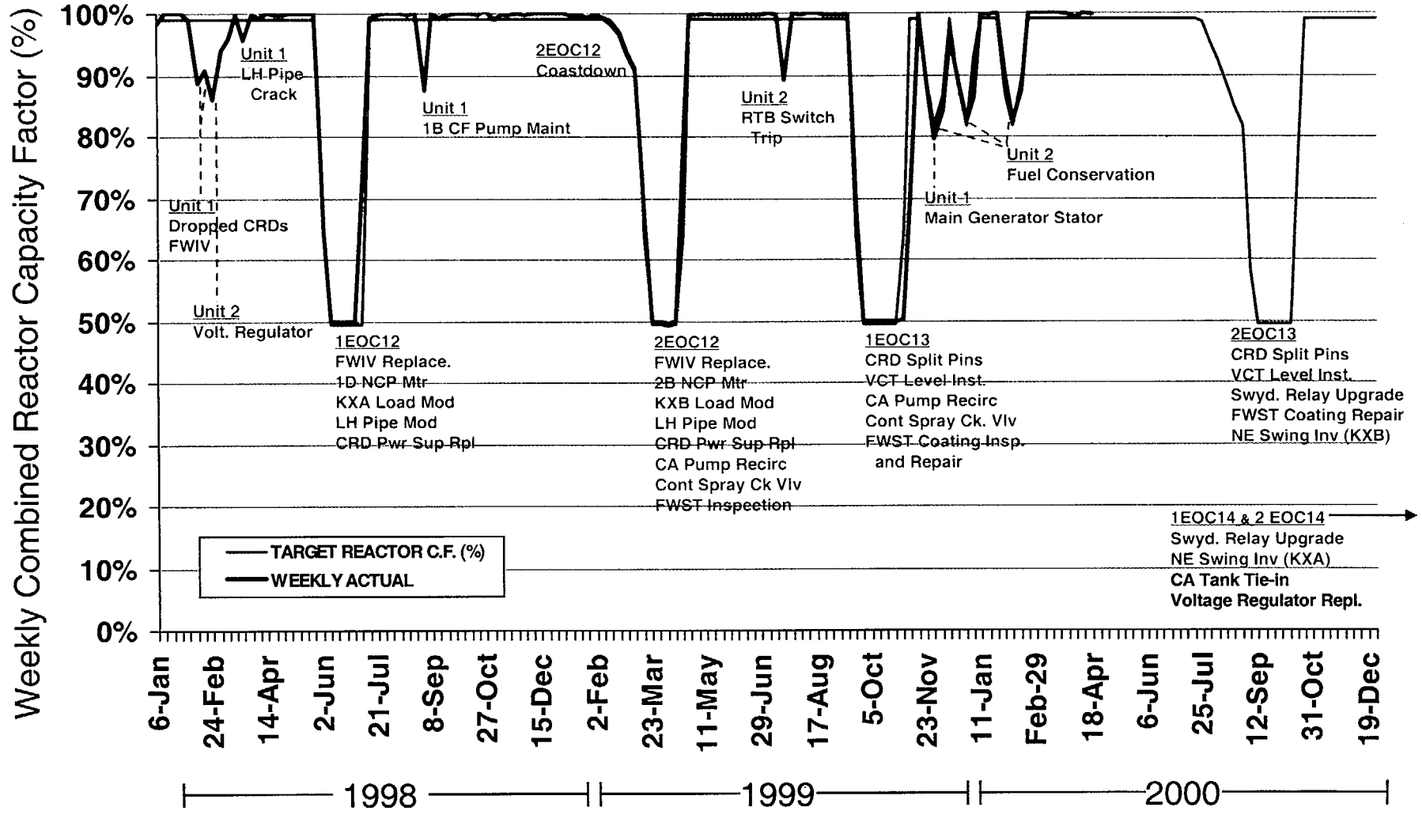
Agenda

- **Overview -** ***Brew Barron***
  - **3 Year Power History**
  - **Performance Indicators**
- **Station Performance -** ***Dhiaa Jamil***
  - **Power History and Plans**
  - **Human Performance Activities**
- **Engineering Issues -** ***Jack Peele***
  - **Current Challenges**
  - **Planned Modifications**
  - **ISFSI**
- **Corrective Actions -** ***Bryan Dolan***

McGuire Nuclear Station

GENERATION STATUS TRENDING

1998 - 2000 Actual vs. Target



NRC Performance Indicators

#	NRC Performance Indicator	Unit 1		Unit 2	
	Initiating Events:				
IE-1	Unplanned Scrams Per 7000 Critical Hours (automatic & manual during previous 4 quarters)	0 (Green)	⇔	0.83 (Green)	⇔
IE-2	Scrams with a Loss of Normal Heat Removal (over the previous 12 quarters)	1 (Green)	⇔	1 (Green)	⇔
IE-3	Unplanned Power Reductions (Transients) per 7000 Critical Hours (over previous 4 quarters)	0 (Green)	⇔	0 (Green)	⇔
	Mitigating Systems:				
MS-1	Safety System Unavailability (SSU) - Emergency Power (average of previous 12 Quarters)	0.70% (Green)	⇔	1.50% (Green)	⇔
MS-2	Safety System Unavailability (SSU) - High Pressure Safety Injection (average of previous 12 Quarters)	0.77% (Green)	⇔	0.76% (Green)	⇔
MS-3	Safety System Unavailability (SSU) - Auxiliary Feedwater (average of previous 12 Quarters)	0.67% (Green)	⇔	0.67% (Green)	⇔
MS-4	Safety System Unavailability (SSU) - Residual Heat Removal (average of previous 12 Quarters)	0.95% (Green)	⇔	1.04% (Green)	⇔
MS-5	Safety System Functional Failures (over previous 4 Quarters)	0 (Green)	⇔	0 (Green)	⇔
	Barrier Integrity:				
BI-1	Reactor Coolant System (RCS) Specific Activity (maximum monthly values, % of Tech. Spec. Limit, during previous 4 Qtrs.)	0.03% (Green)	⇔	0.05% (Green)	⇔
BI-2	RCS Identified Leak Rate (maximum monthly values, % of Tech. Spec. Limit, during previous 4 Qtrs.)	1.88% (Green)	⇔	2.23% (Green)	⇔

NRC Performance Indicators

	Emergency Preparedness:				
EP-1	Drill/Exercise Performance (over previous 8 Qtrs.)	95.40% (Green)	⇔	95.40% (Green)	⇔
EP-2	ERO Drill Participation (% of Key ERO personnel that participated in a drill or exercise in the previous 8 quarters)	97.10% (Green)	⇔	97.10% (Green)	⇔
EP-3	Alert & Notification System Reliability (% reliability during previous 4 quarters)	95.70% (Green)	⇔	95.70% (Green)	⇔
	Occupational Radiation Safety:				
OR-1	Occupational Exposure Control Effectiveness (occurrences during previous 12 Qtrs.)	2 (Green)	⇔	2 (Green)	⇔
	Public Radiation Safety:				
PR-1	RETS/ODCM Radiological Effluent Occurrence (occurrences during previous 4 Qtrs.)	0 (Green)	⇔	0 (Green)	⇔
	Physical Protection:				
PP-1	Protected Area Security Equipment Performance Index (over a 4 quarter period)	0.018 (Green)	⇔	0.018 (Green)	⇔
PP-2	Personnel Screening Program Performance (reportable events during previous 4 Qtrs.)	0 (Green)	⇔	0 (Green)	⇔
PP-3	Fitness-For-Duty (FFD)/Personnel Reliability Program Performance (reportable events during previous 4 Qtrs.)	0 (Green)	⇔	0 (Green)	⇔

Acceptable Performance	Increased Regulatory Response	Required Regulatory Response	Unacceptable Performance

Improving ↑ Degrading ↓ Unchanged ⇔

Station Performance

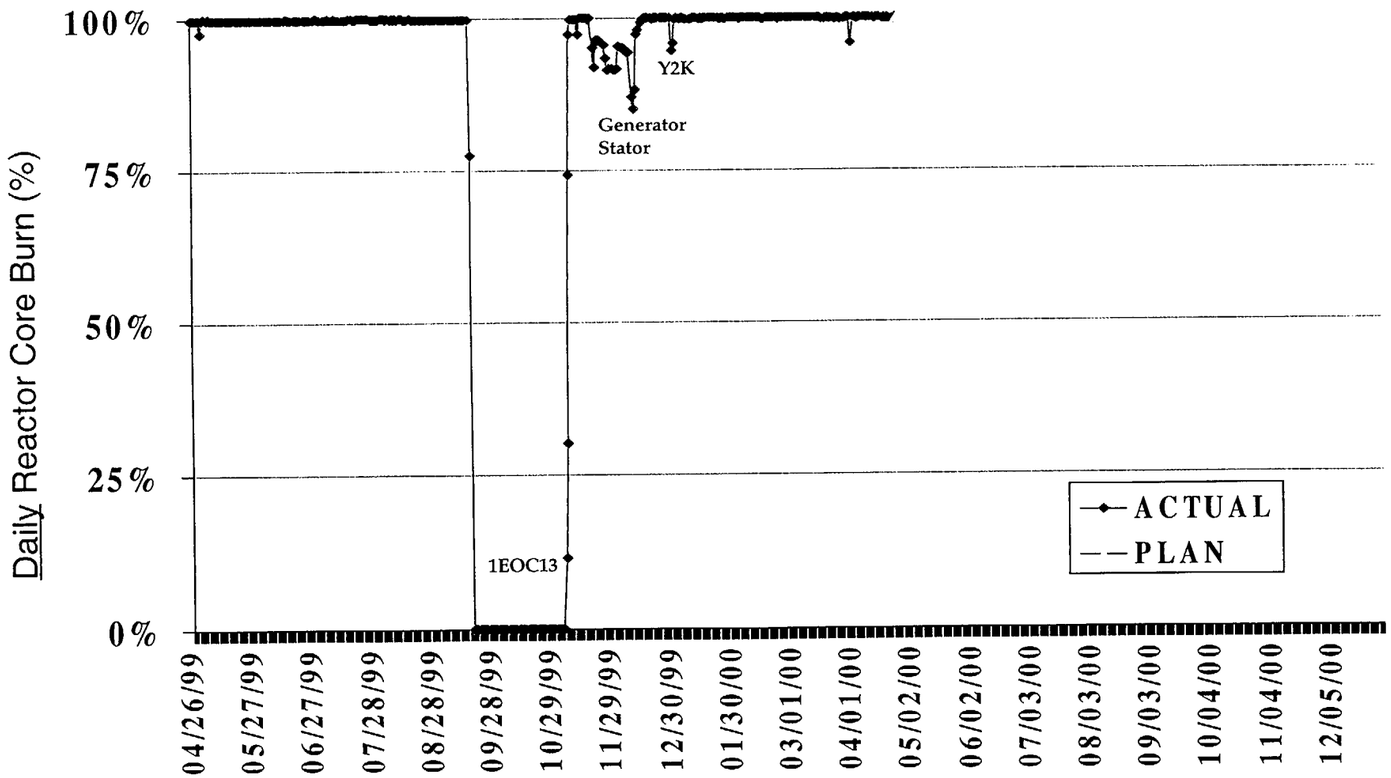
Power History and Plans

Human Performance Activities

McGuire Nuclear Station

REACTOR CORE BURN - UNIT 1

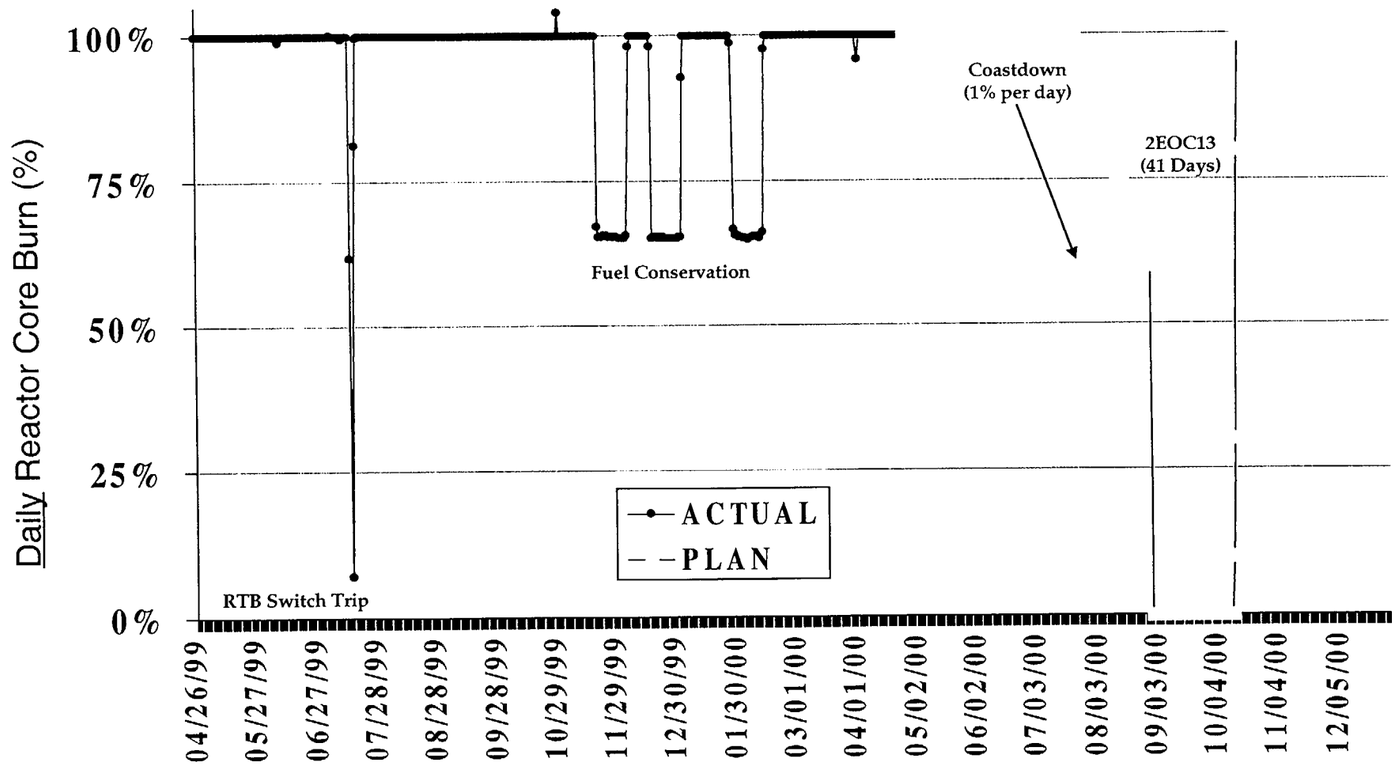
Actual 12 Months Ending April 25, 2000



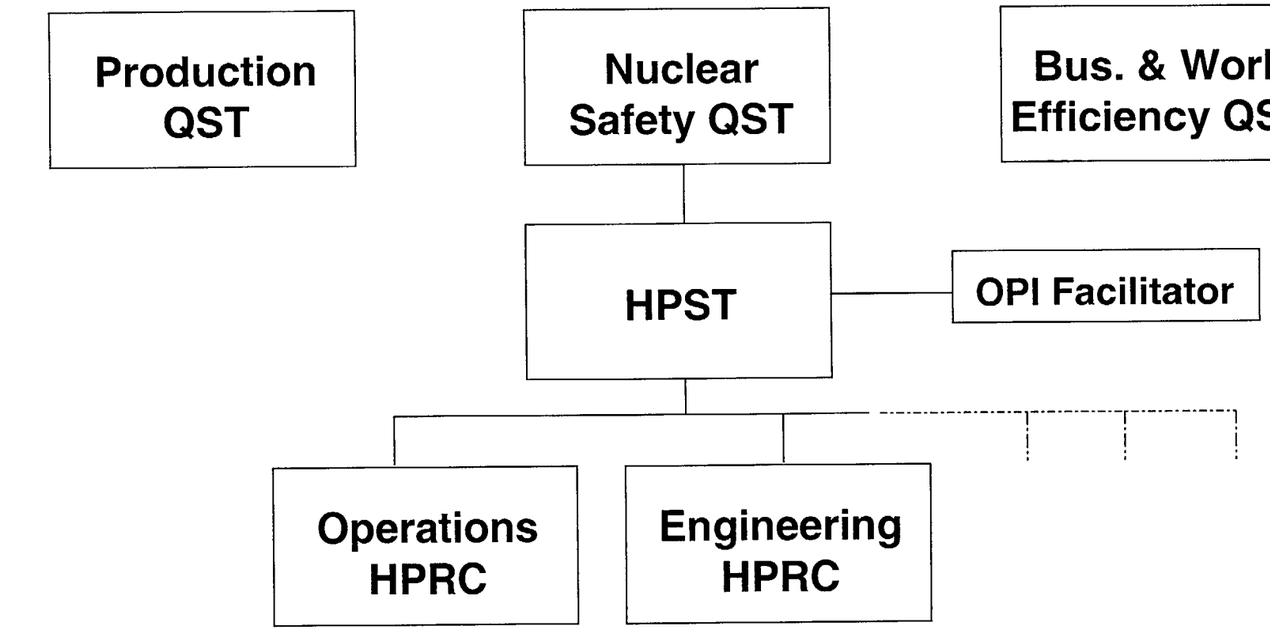
McGuire Nuclear Station

REACTOR CORE BURN - UNIT 2

Actual 12 Months Ending April 25, 2000



McGuire Human Performance Oversight Structure



QST - Quality Steering Team
HPST - Human Performance Steering Team
HPRC - Human Performance Review Committee
OPI - Organizational Performance Improvement

Human Performance Barriers & Feedback Mechanisms

- Internal
- Peer
- Supervisory

Human Performance Initiatives

- **Continuing training on human performance fundamentals**
  - Case study - Titanic (site wide)
  - Human performance workshop / additional training (group contacts)
  - Management training on fundamentals and standards
- **Peer coaching**
- **Job observation**
  - Focused on coaching
  - Management observation program
  - Group level observation program

Operator Licensing Exam

- 12 Candidates
- 5 RO's, 7 SRO's (2 instant)
- MNS developed written exam and submitted to NRC on 3/23/00
- Audit exam successfully completed 4/14 - 4/17/00
- NRC Prep Visit - Week of 4/24/00
- NRC Written Exam - 5/19/00

Engineering Issues

Current Challenges

Planned Modifications

ISFSI

Digital Rod Position Indication

- **Background**
  - Multiplexer (I/O) resets
  - Power supply failure on '1B' train
  - Ethernet failure on '2A' train
  - Disabled purge function on '2A' train
  - SDS PC failure on '2A' train

Digital Rod Position Indication

• Problem Resolution	Status
- Replaced 1B power supply	Complete
- Replaced U2 A Alpha PC	Complete
- Re-enabled purge function in 2A train, confirmed other trains not similarly affected	Complete
- Replaced U2 SDS PC (including keypad driver)	In Progress
- Resolve multiplexer resets Requires system development and testing by vendor	

Rod Control System

- **Background**
  - **Intermittent urgent alarms prior to 1EOC13 outage**
  - **One urgent alarm in SCDE power cabinet, Unit 1, Dec '99**
  - **Six urgent alarms in 1BD power cabinet over the current cycle, Unit 2**

Rod Control System

• Problem Resolution	Status
- Unit 1 card inspections, logic cabinet card tests, selected power cabinet card tests	Complete
- Replaced Unit 1 card A301 (Dec '99)	Complete
- Replaced Unit 2 movable regulation and decoder cards (Apr '00)	Complete
- Reset system, under direction from engineering	As Needed
- Unit 2 card inspections, logic cabinet card tests, selected power cabinet card tests	Planned

Instrument Loop Power Supplies

- **Background**
  - 1995 - McGuire evaluates Oconee's Lambda Power Supply age related failures
    - No MNS failure problems identified
  - 1995 - McGuire creates Instrument Loop Power Supply Engineering Support Document & Health report
    - List of installed power supplies established
  - 1998 - McGuire identifies potential adverse failure trend (PIP M-98-0490)
    - Engineering support document/Component Health reports track failures

Instrument Loop Power Supplies

- Background (cont'd)
  - **1998 - McGuire documents root cause of failures (PIP M-98-1912)**
  - **1999 - Duke I&C BEST charters Instrument Loop Power Supply Working group**
  - **2000 - Instrument loop power supplies are identified as Maintenance Rule A(1) for McGuire**

Instrument Loop Power Supplies

- **Problem Resolution**

	Status
– Identified installed power supplies and affected loops	Complete
– Established replacement priorities	Complete
– Standardized replacements	Complete
– Replacing using scheduled PMs & specific work orders	In Progress
– Establish replacement frequencies with new PMs	In Progress
– Evaluate component health, revise / establish PMs appropriate	Future

Auxiliary Feedwater Storage Tanks

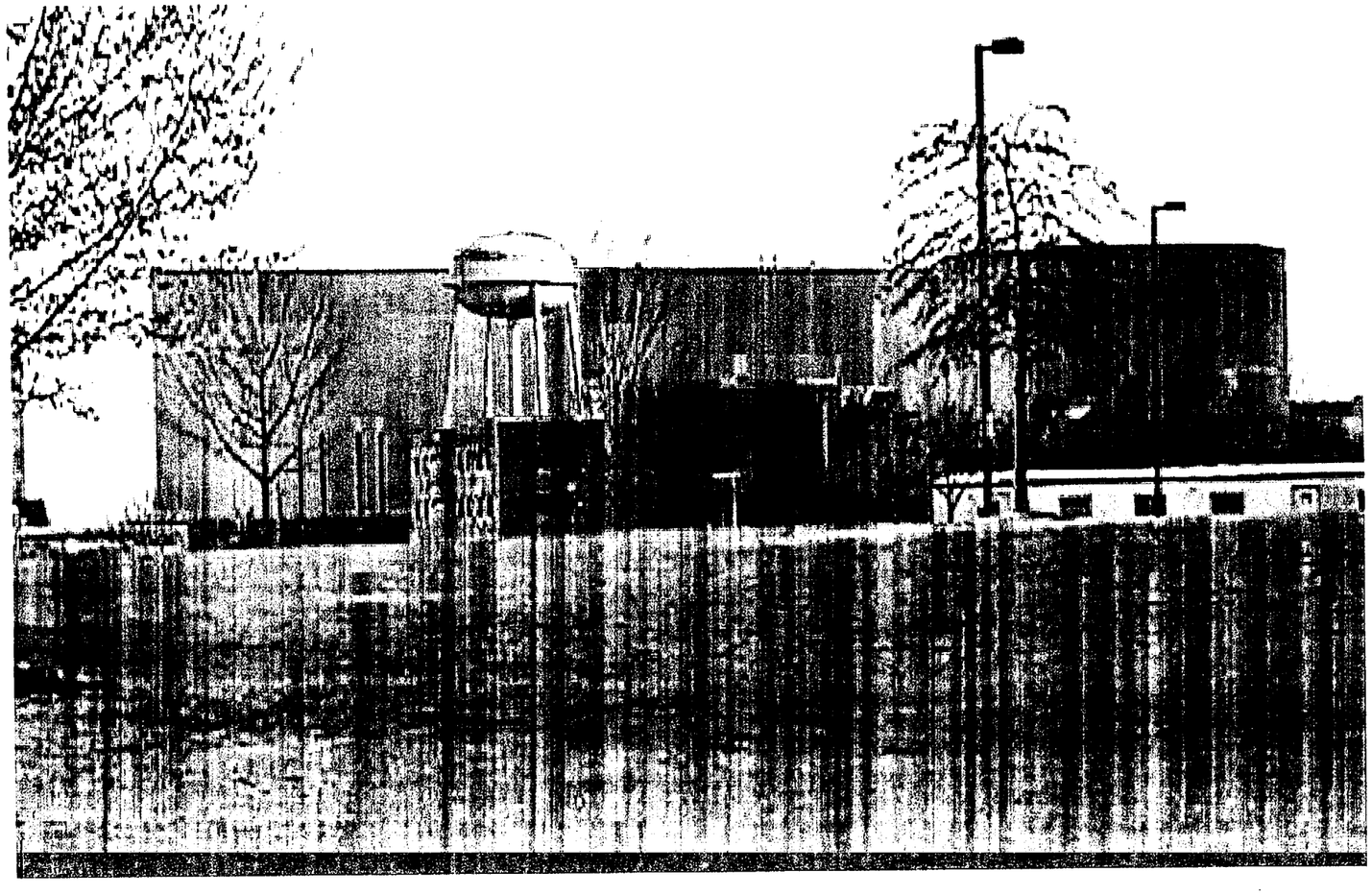
- **Purpose**
  - For each Unit, add a large condensate-quality, non-assured tank as a suction source for Aux Feedwater, to reduce Operator burden early in postulated events and to improve design margin of the system.

- **Key Focus Areas**
  - Scope control
  - Underground interferences
  - Personnel safety and Unit reliability during tank construction

Auxiliary Feedwater Storage Tanks

- **Significant Progress**
  - U1 tank design completed
  - Craft project manager for tie-ins selected
  - Removed above-ground interferences
- **Next Steps**
  - Remove or relocate underground interferences
  - Complete remaining design packages
  - Implement mods, tie in during 1EOC14 and 2EOC14

Planned Auxiliary Feedwater Tank Location



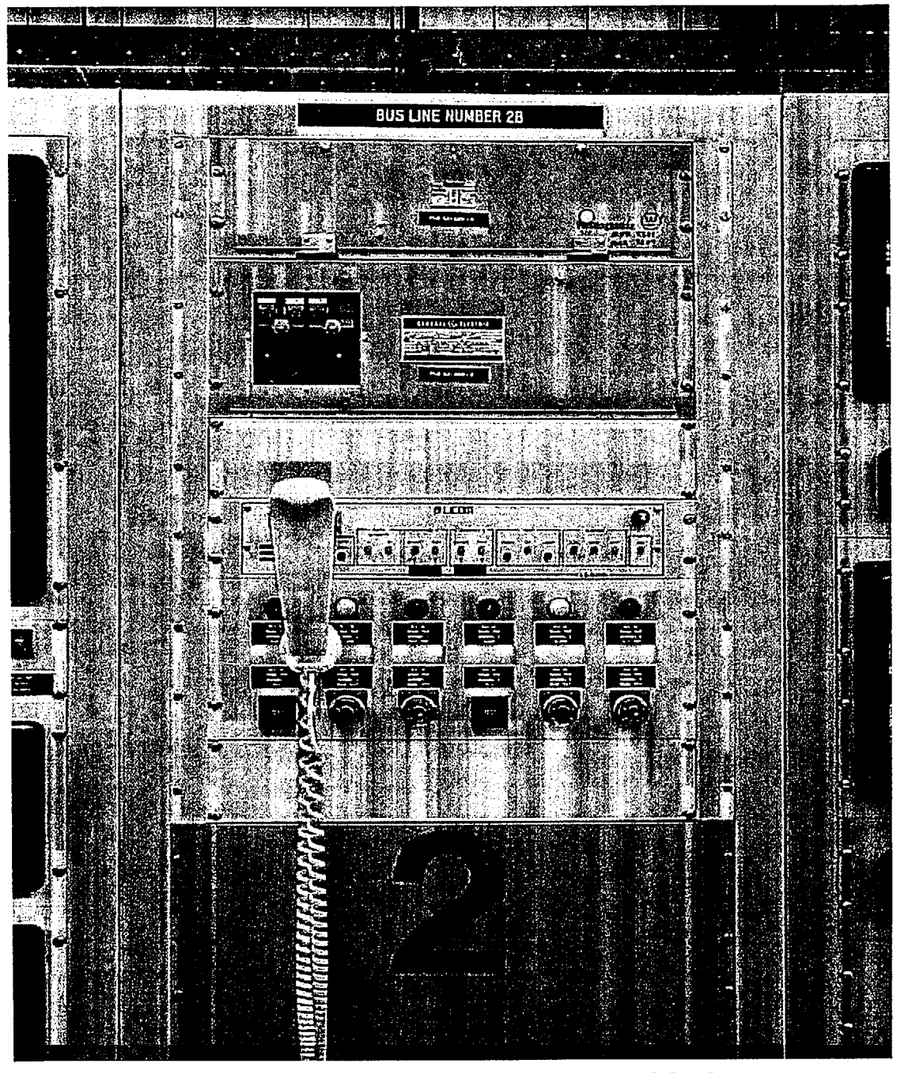
Busline Protective Relay Replacements

- **Purpose**
  - Replace protective relaying on the bus lines that connect McGuire Nuclear Station to the Switchyard, due to pending obsolescence and equipment failure history

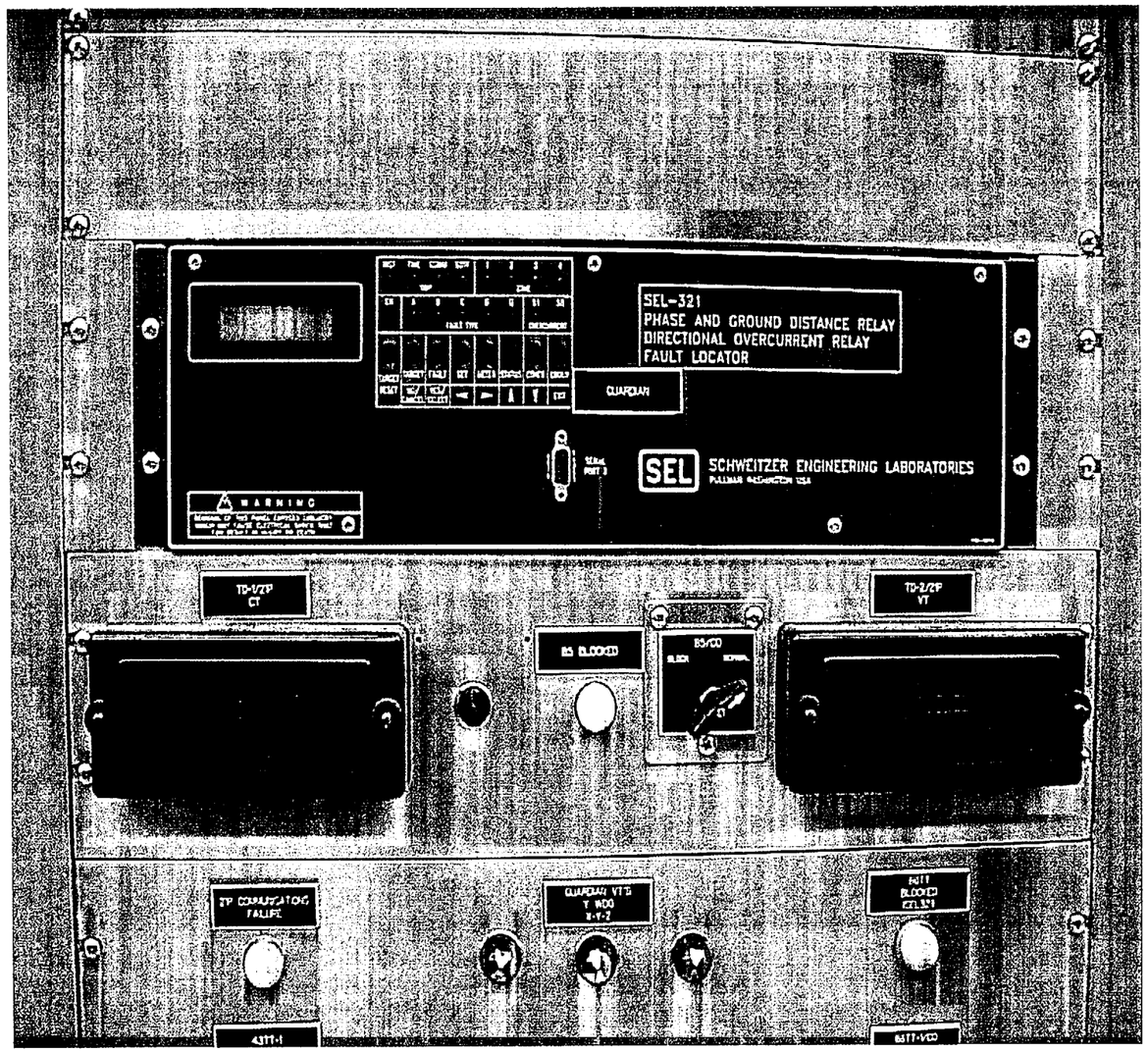
- **Key Focus Areas**
  - Coordination of shutdown risk profile during installation
  - Post-mod testing

Busline Protective Relay Replacements

- **Significant Progress**
  - Extensive design work, prior to previous deferral of mod
- **Next Steps**
  - Conduct readiness review
  - Implement mod starting with 2EOC13



Existing Communication Unit



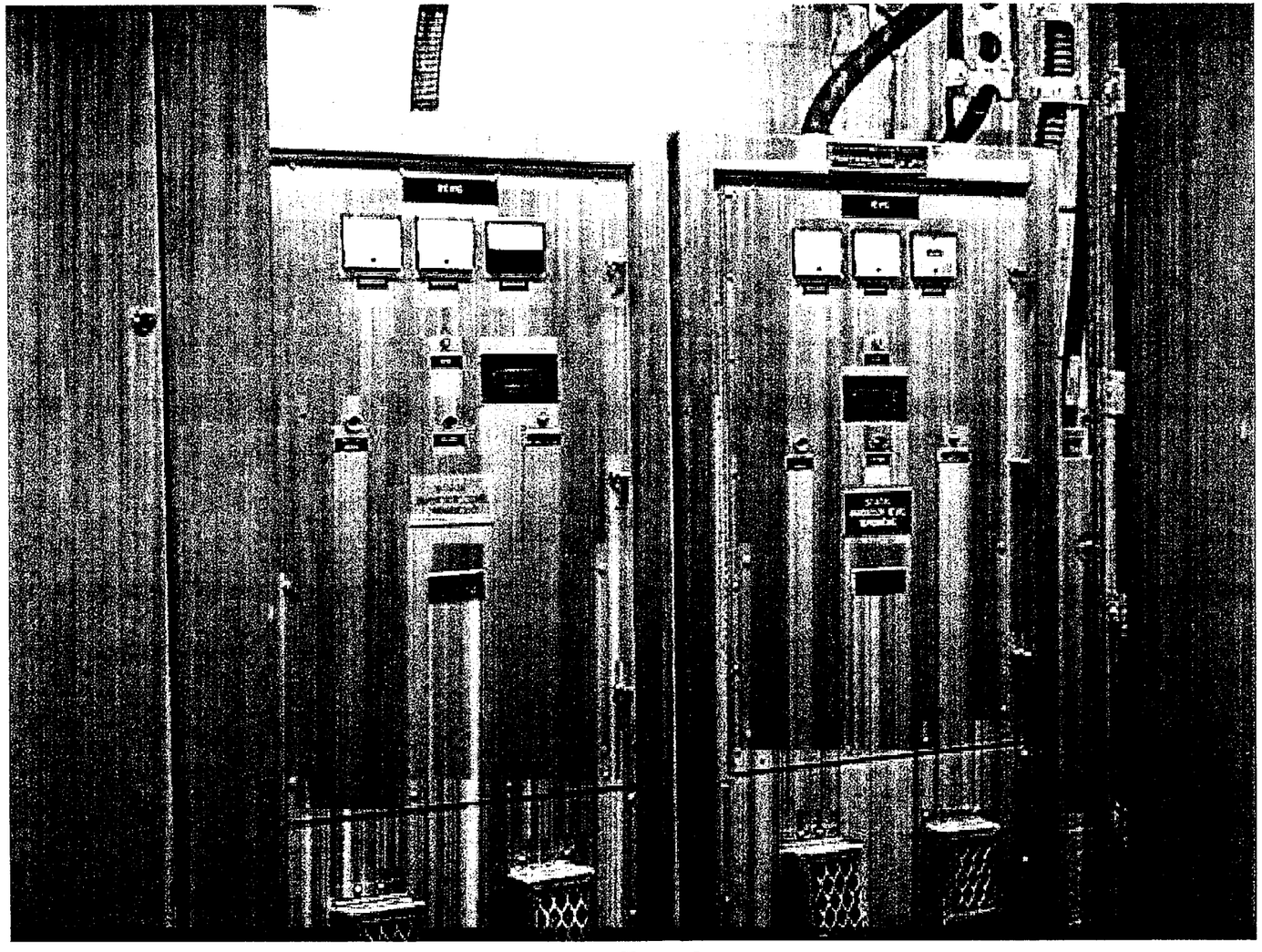
IMUX Communication Unit

Inverter Replacements

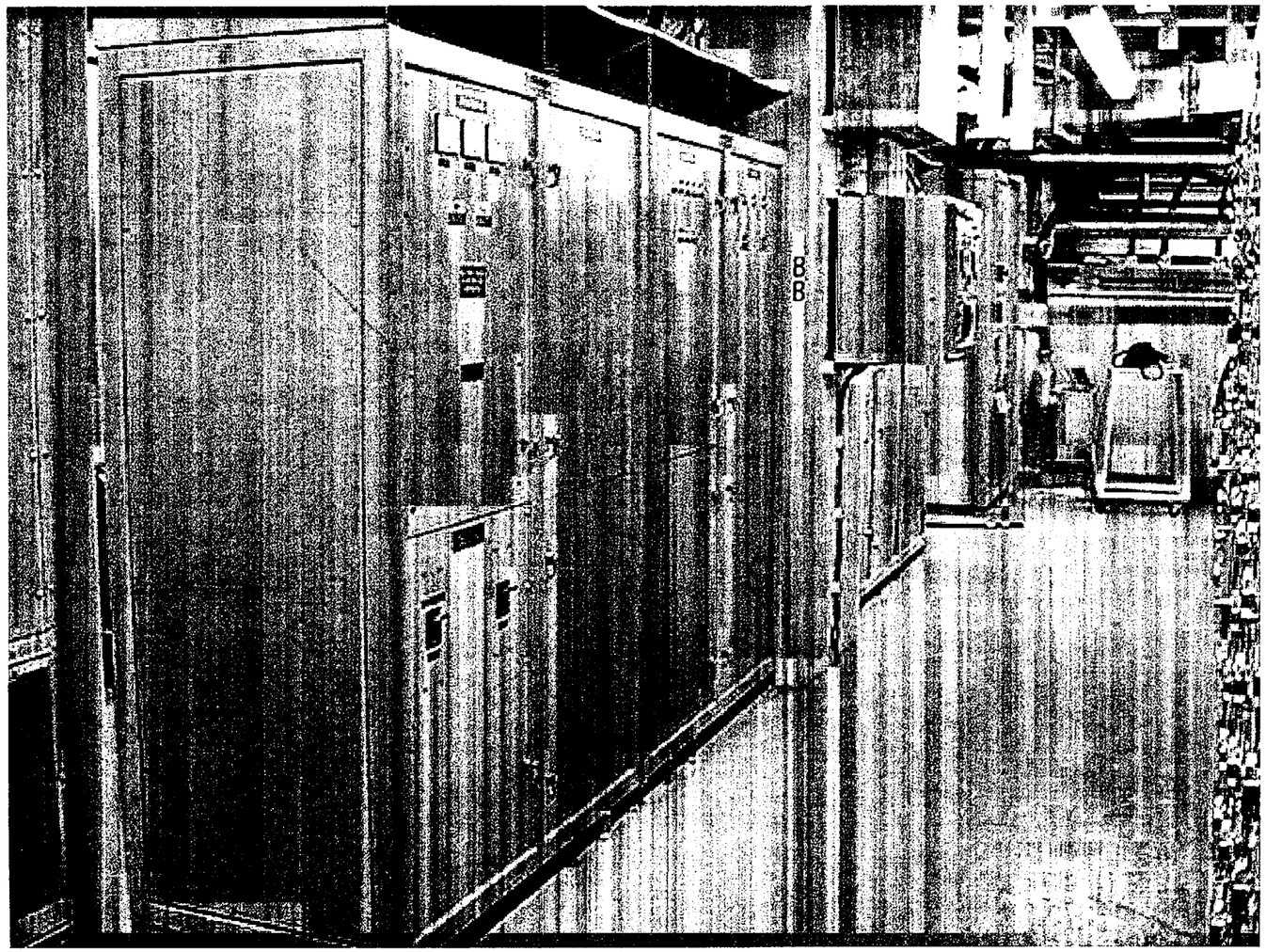
- **Purpose**
  - Replace existing 120 VAC vital inverters and non-vital inverters due to pending obsolescence.
  - Add a new spare non-vital inverter, to avoid future unit challenge due to loss of a single non-vital inverter.
- **Key Focus Areas**
  - Compatibility of new equipment with old
  - Coordination of on-line and outage work scope
  - Electrical craft resources

Inverter Replacements

- **Significant Progress**
  - Orders placed and major equipment being received
  - U2 vital Mod Final Scope Document completed
- **Next Steps**
  - Issue U2 installation procedures and post-mod test plans
  - Issue U2 non-vital Mod Final Scope document



Inverter Replacement



Inverter Replacement

Reactor Internals Guide Tube Support Pin Replacement

- **Purpose**
  - Replace split pins on both Units, to eliminate risk of cracked fasteners inside the primary system

- **Key Focus Areas**
  - Suitability of tooling and temporary RV cover
  - As built details of reactor internals
  - Equipment access through staging building
  - Execution team readiness

Reactor Internals Guide Tube Support Pin Replacement

- **Significant Progress**
  - Completed Unit 1 during 1EOC13
  - U2 Final Scope Document issued
  - Vendor final design review and site walkdown

- **Next Steps**
  - Mock ups and training
  - Obtain experience from Korean plant
  - Implement mod during 2EOC13

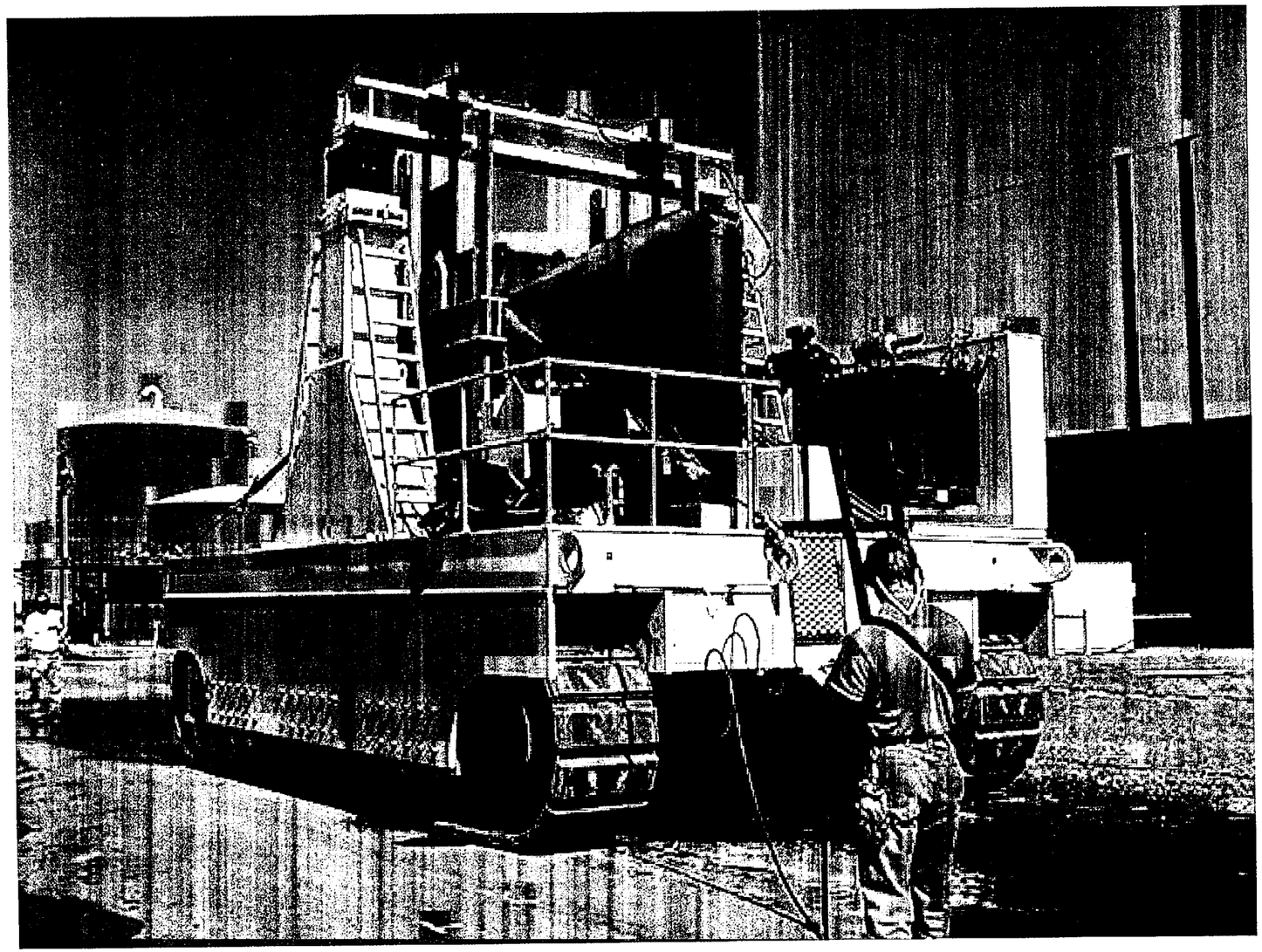
ISFSI

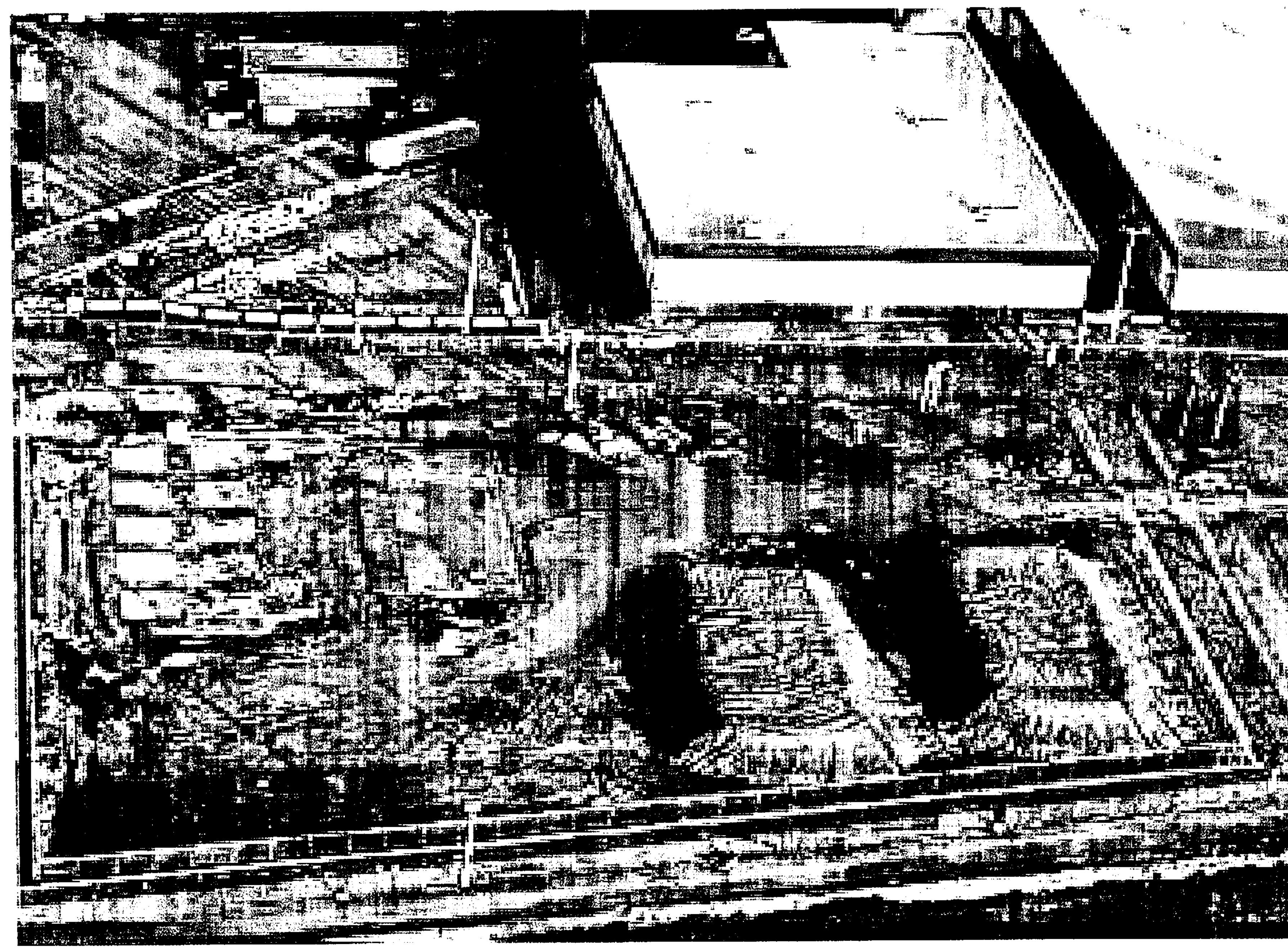
- **Purpose**
  - Provide on site spent fuel storage beyond capacity of Spent Fuel Pools

- **Key Focus Areas**
  - Cask manufacturing delays
  - Licensing process
  - Coordination with Unit refueling outage schedules

ISFSI

- **Significant Progress**
  - Received and tested transporter vehicle, validated haul path
  - Storage site design and construction completed
  - Security system modified
- **Next Steps**
  - Complete procedures and training
  - Receive casks
  - Perform dry runs
  - Load spent fuel for storage





Corrective Actions

Corrective Action Program
Corrective Action Prioritization Scheme

Priority	App B Relationship
I - Important	CAQ
R - Routine	CAQ
E – Elective	Not CAQ

Corrective Action Program
Significance Categorization

CAP ↑ ↓

Category	App B Relationship	Causal Analysis	Corrective Action
1	SCAQ	Root Cause	CAPR*
2	CAQ	Root Cause	CAPR
3	CAQ	Apparent Cause	CA
4	CAQ	None	CA
5	Not CAQ	-	-

CAP = Corrective Action Program
SCAQ = Significant Condition Adverse to Quality
CAQ = Condition Adverse to Quality
CAPR = Corrective Action to Prevent Recurrence
CA = Corrective Action

*** Regulatory Required**