



Catawba Nuclear Station Service Water Project Update

December 7, 2005

Participants

Name

Title

Dhiaa Jamil

Site Vice-President – CNS

Bill Pitesa

Station Manager-CNS

Regis Repko

Engineering Manager-CNS

Dan McRaine

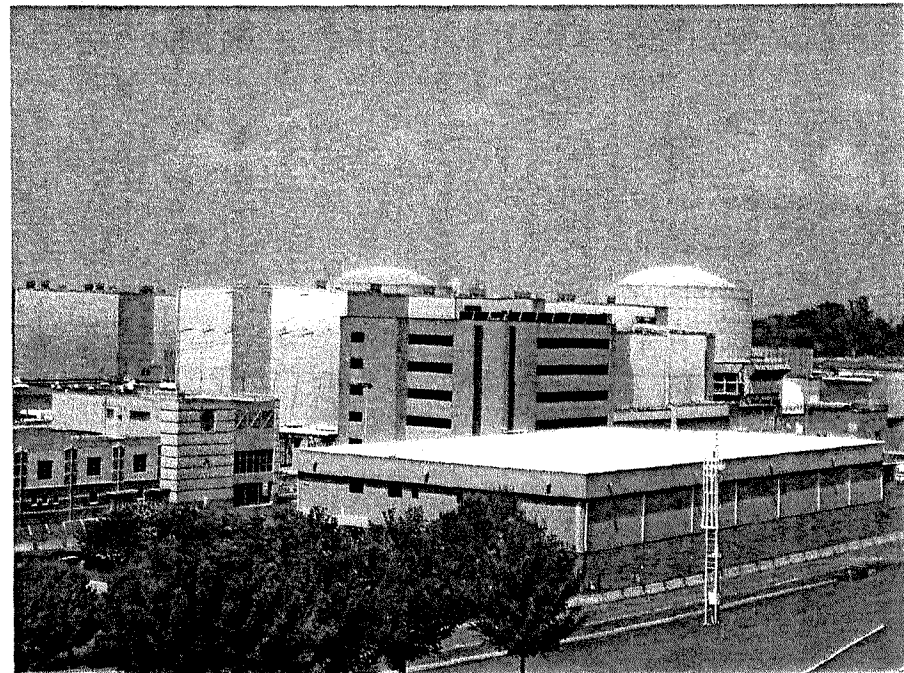
Project Director – Nuclear
Service Water Project

Agenda

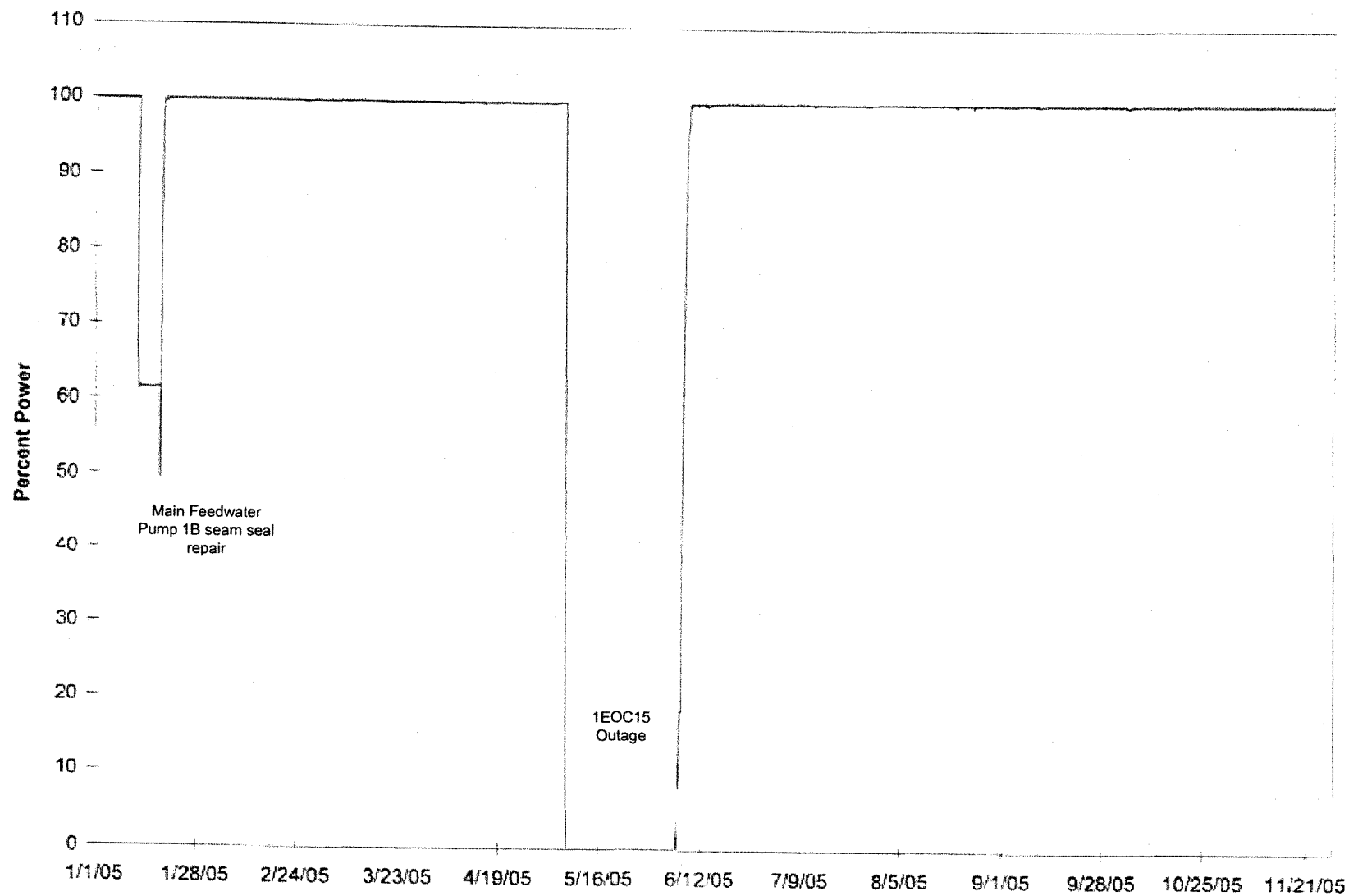
- Opening Remarks Dhiaa Jamil
- Station Performance Regis Repko
 - Reliability / Predictability
 - Equipment Performance
 - Safety System Results
 - Plant Equipment Items / Improvements
- Service Water Project Status Bill Pitesa
 - Low Pressure Service Water
 - Water Treatment System
 - Mock-Up Piping
 - Nuclear Service Water Lake Intake Piping
 - 12 Day Nuclear Service Water Outage
 - Resource Plan
- Miscellaneous Items and Closing Remarks Dhiaa Jamil

2005 In Review

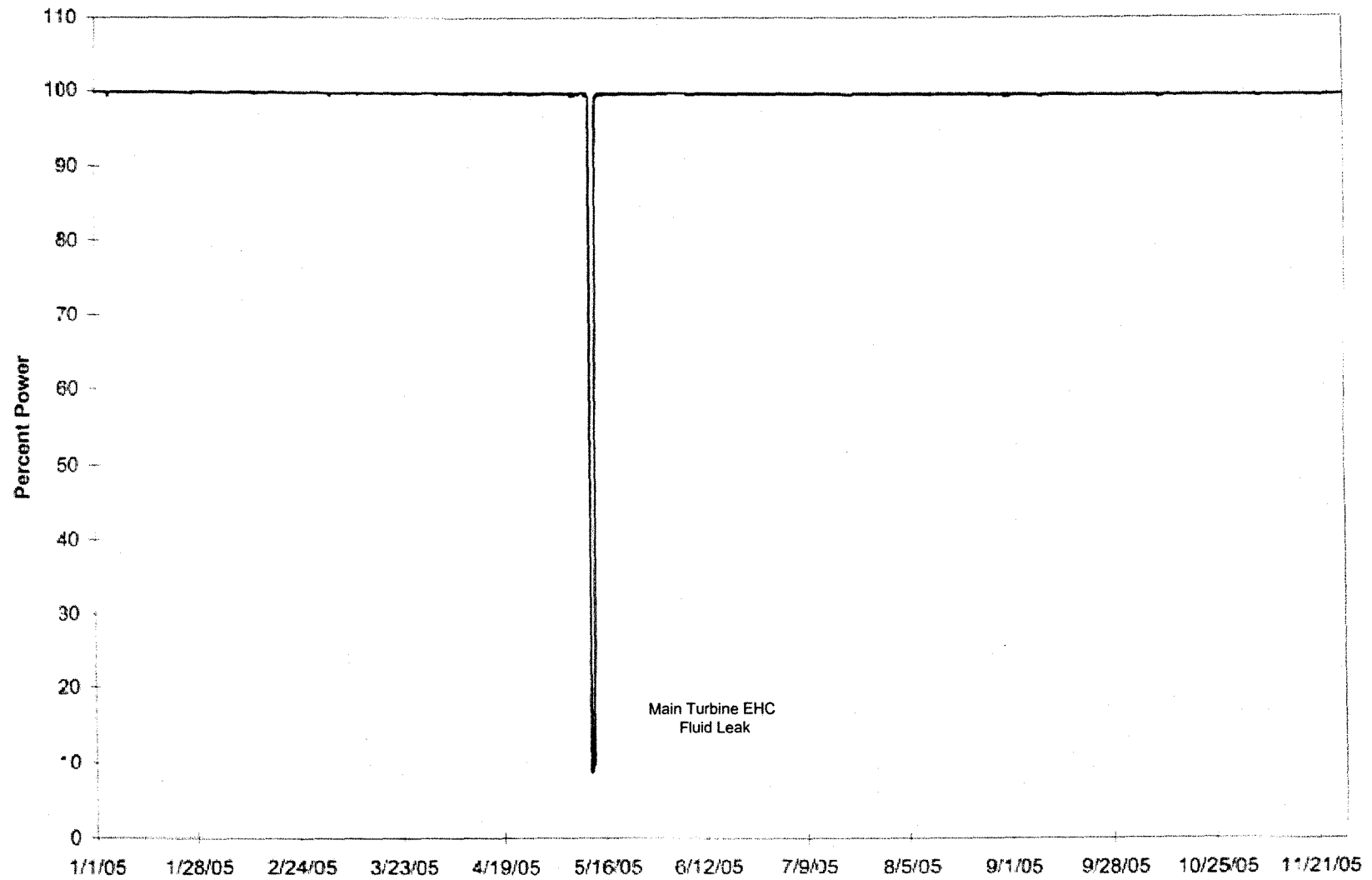
- Duke and Cinergy Merger
- Senior Site Management Changes
- ISFSI Construction
- Technical Training Programs
Accreditation Renewed
- MOX Lead Test Assemblies Installed
- Industry Recognition for Thermal
Efficiency (BTU/kwh) and Generation
Efficiency (\$/kwh)
- Lowest Duke Dose for an Outage with
SG Inspection and Lowest CNS Outage
Personnel Contamination Events
- No Licensee Event Reports
- Green Performance Indicators and
Violations
- No Reactor Trips
- Improvements in Equipment Reliability



2005 Unit 1 Power History



2005 Unit 2 Power History



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Reliability / Predictability

	2003	2004	2005 through October
Unplanned Lost EFPD (does not include outage extensions)	15.7	16.8	3.8
Outage Extension Days	22	6.6	3
Lost Gen days to equip. failures (on-line & outage)	23.8	17.5	2.5

Equipment Performance

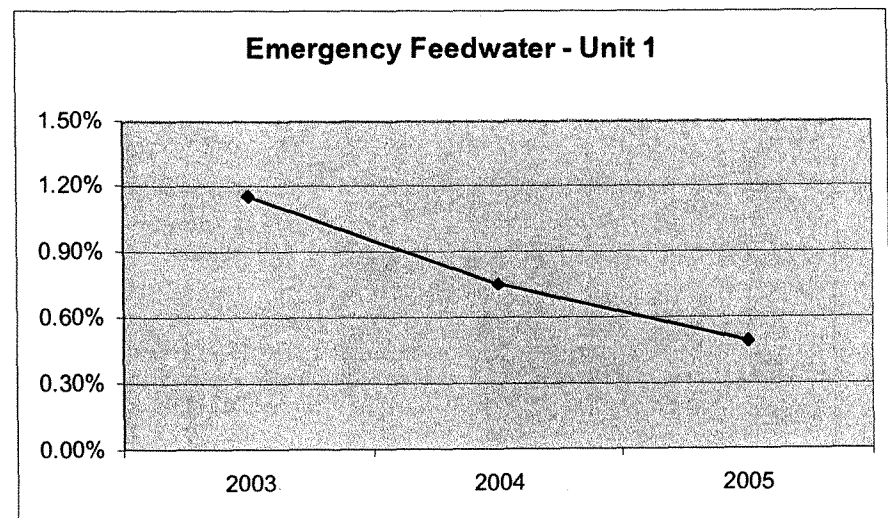
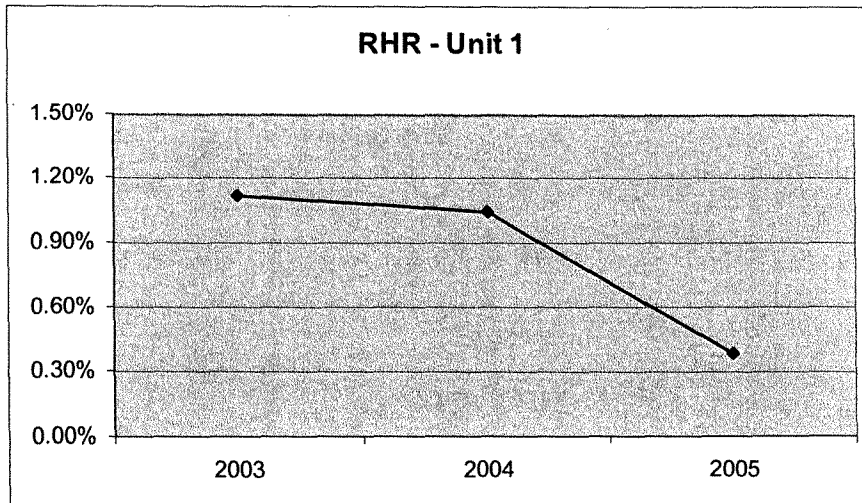
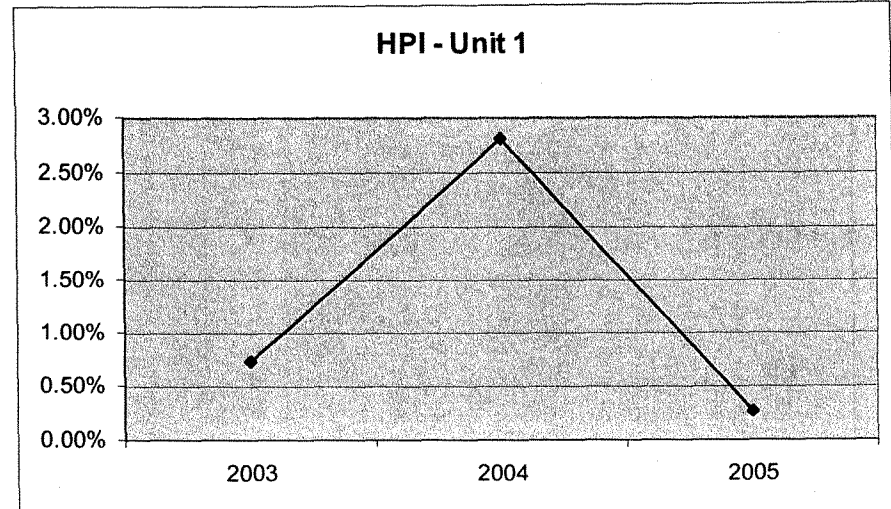
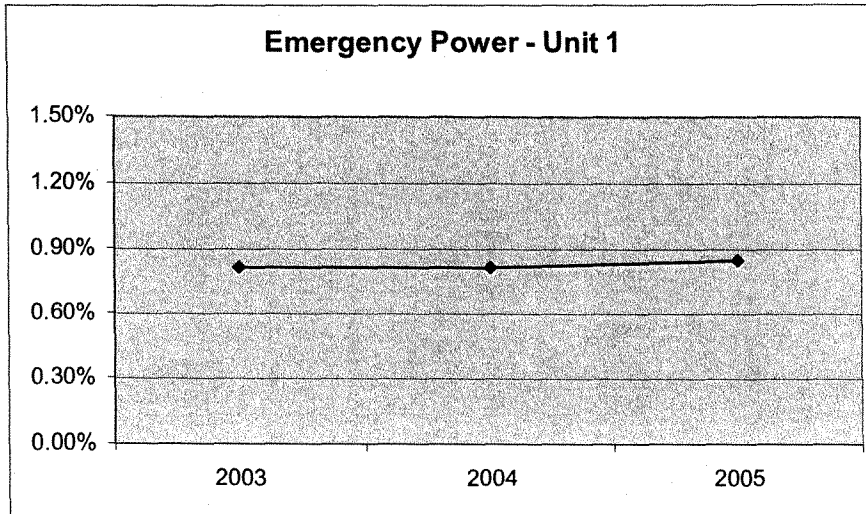
	2003	2004	Nov '04 – Oct '05
All MRFF* (12 month total)	55	42	29
HSS* MRFF (12 month total)	28	20	11
All UTSE* (12 month total)	102	77	53
HSS UTSE (12 month total)	58	36	21

* MRFF – Maintenance Rule Functional Failure
HSS – High Safety Significance
UTSE – Unplanned Technical Specification Entry

Equipment Performance

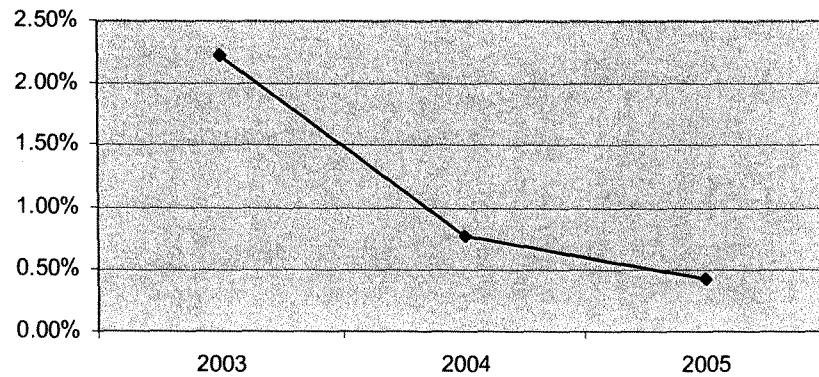
- Significant Improvement in Component Cooling Heat Exchanger Performance
 - Chemical addition capability
 - De-chlorination
 - HX performance monitoring
 - Results:
 - 2002 to 2003: 2-3 months (stainless steel Hx cleaning)
 - 2004 to present: 6-8 months (both stainless steel and brass Hx cleaning)
- Direct Effect on Safety System Unavailability

Unit 1 Safety System Unavailability

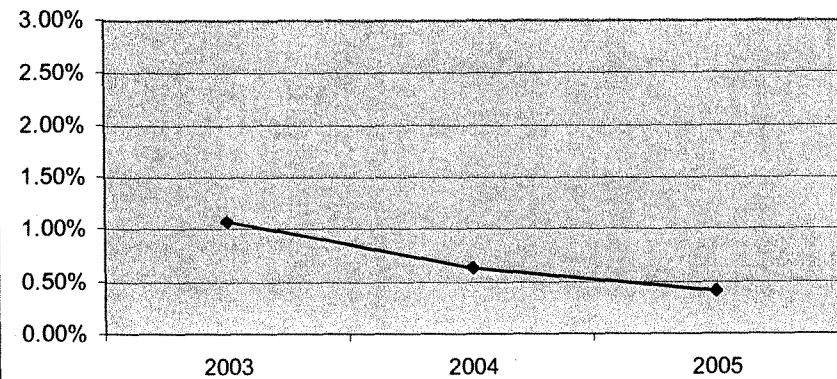


Unit 2 Safety System Unavailability

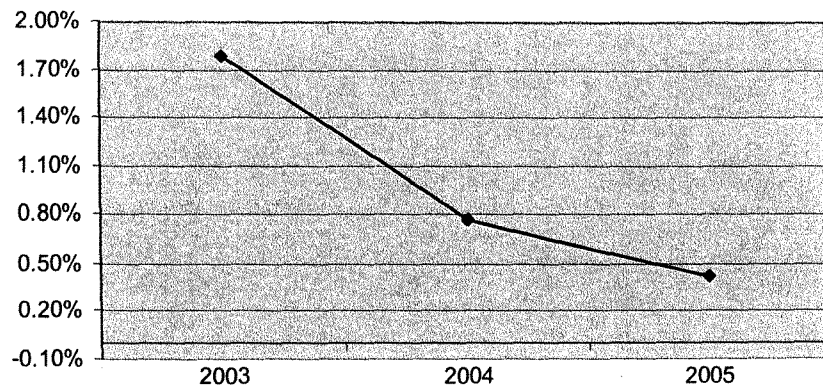
Emergency Power - Unit 2



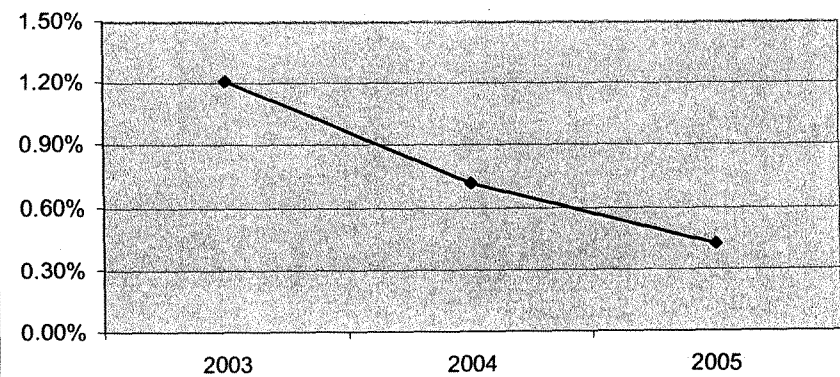
HPI - Unit 2



RHR - Unit 2



Emergency Feedwater - Unit 2



Plant Equipment Items / Improvements

- Diesel Generator batteries replaced
- Digital Feedwater Control card upgrades
- Proactive 7300 card replacements
- Electrical generator rewinds
- 2 reactor coolant pump motor refurbishments
- U1 emergency feedwater check valve relocated
- Emergency feedwater heat trace system improvements
- U1 gas intrusion resolved
- Refueling water storage tank instrumentation lightening protection
- 10 year vessel ISI
- Reactor vessel bottom mounted instrument inspection
- Fire Protection isolation valves replaced
- Low Pressure Service Water (RL, non-safety) pipe replacements
- Monitoring and Trending of raw water heat exchangers
- All containment spray heat exchangers replaced
- Lake intake pipe cleaned and coated

Agenda

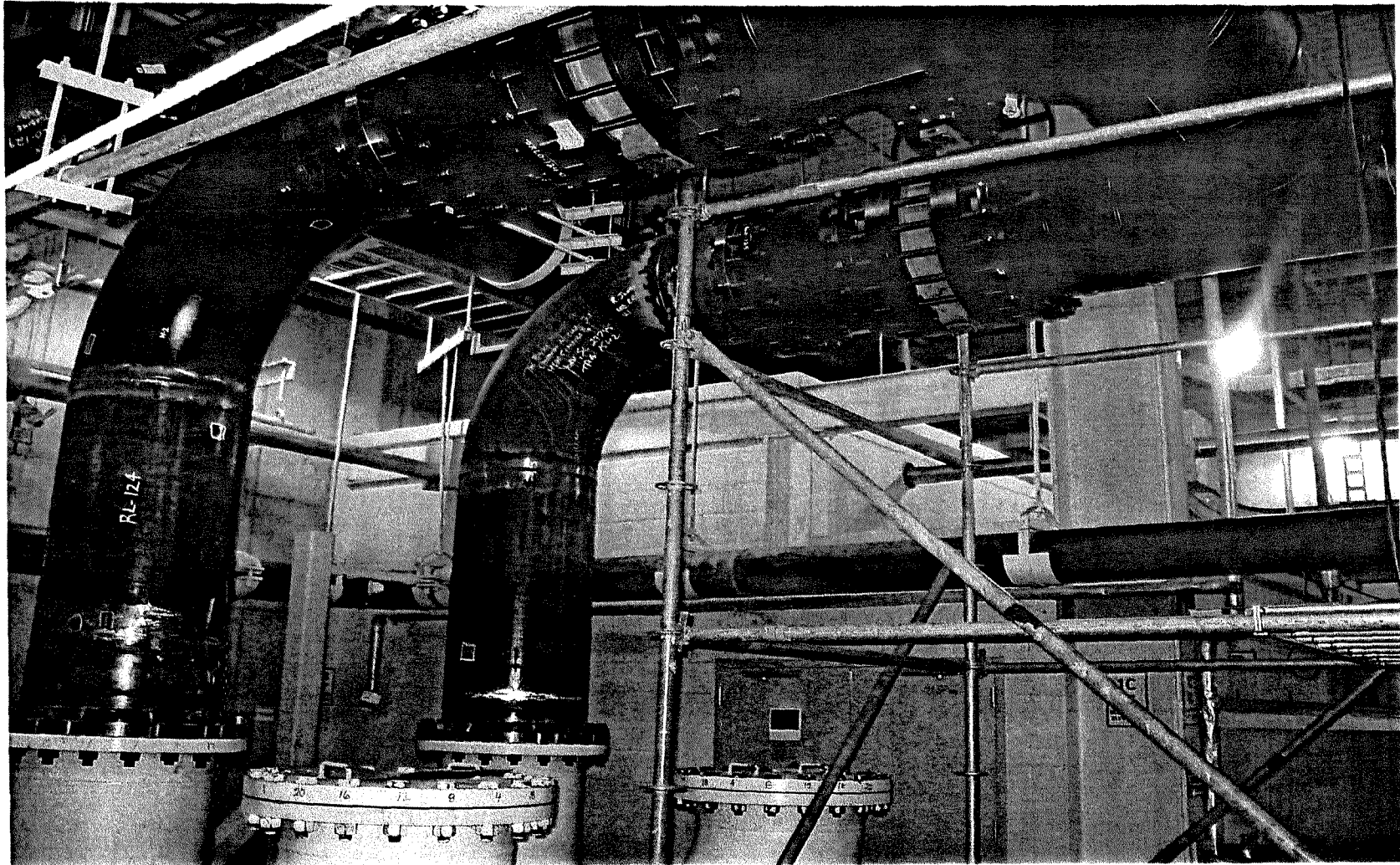
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Service Water Project Status

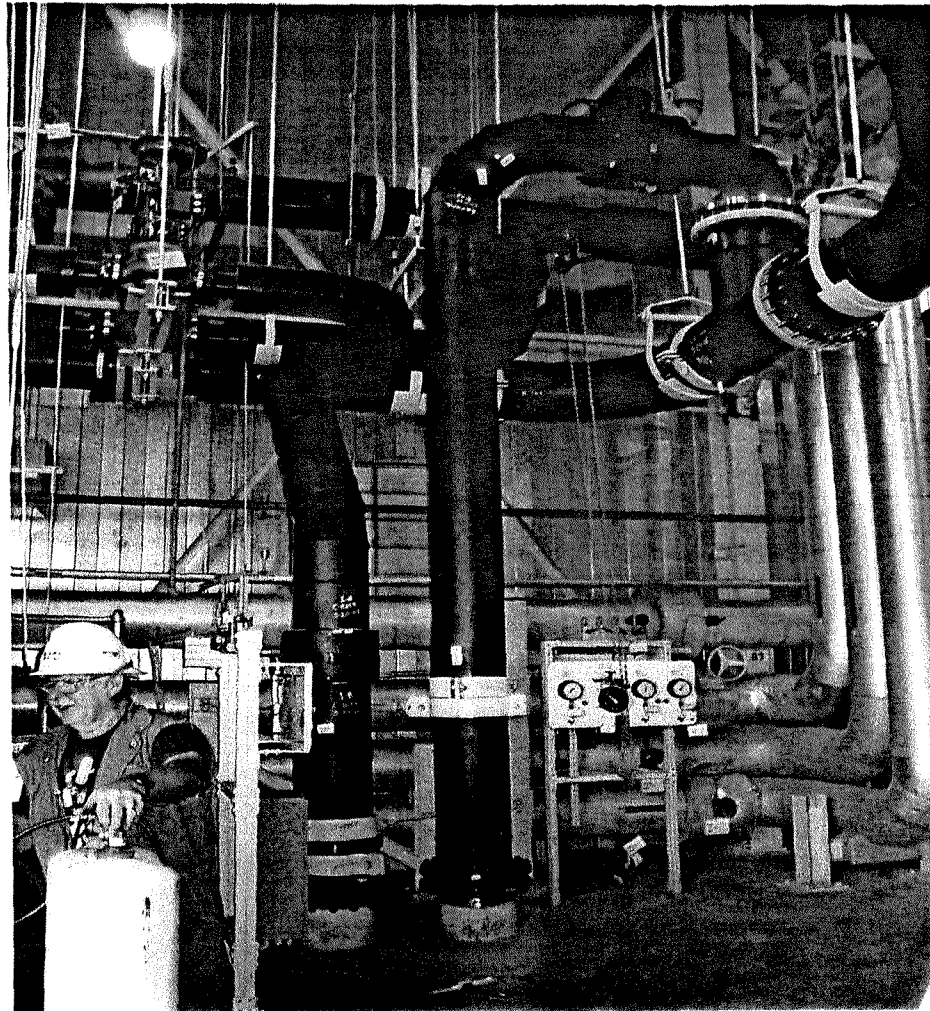
Low Pressure Service Water

- System provides makeup to cooling towers, cools turbine and generator auxiliaries, containment chillers and secondary system pump motors
- Carbon steel piping became degraded from corrosion – cooling capacity was marginal during hot weather
- Restoration is to replace piping with High Density Polyethylene Piping (HDPE)
- Cooling Tower makeup has new control valves and HDPE piping headers
- Turbine/Service building distribution piping changed to HDPE
- New HDPE main supply header installation in progress and will be in service by April 2006

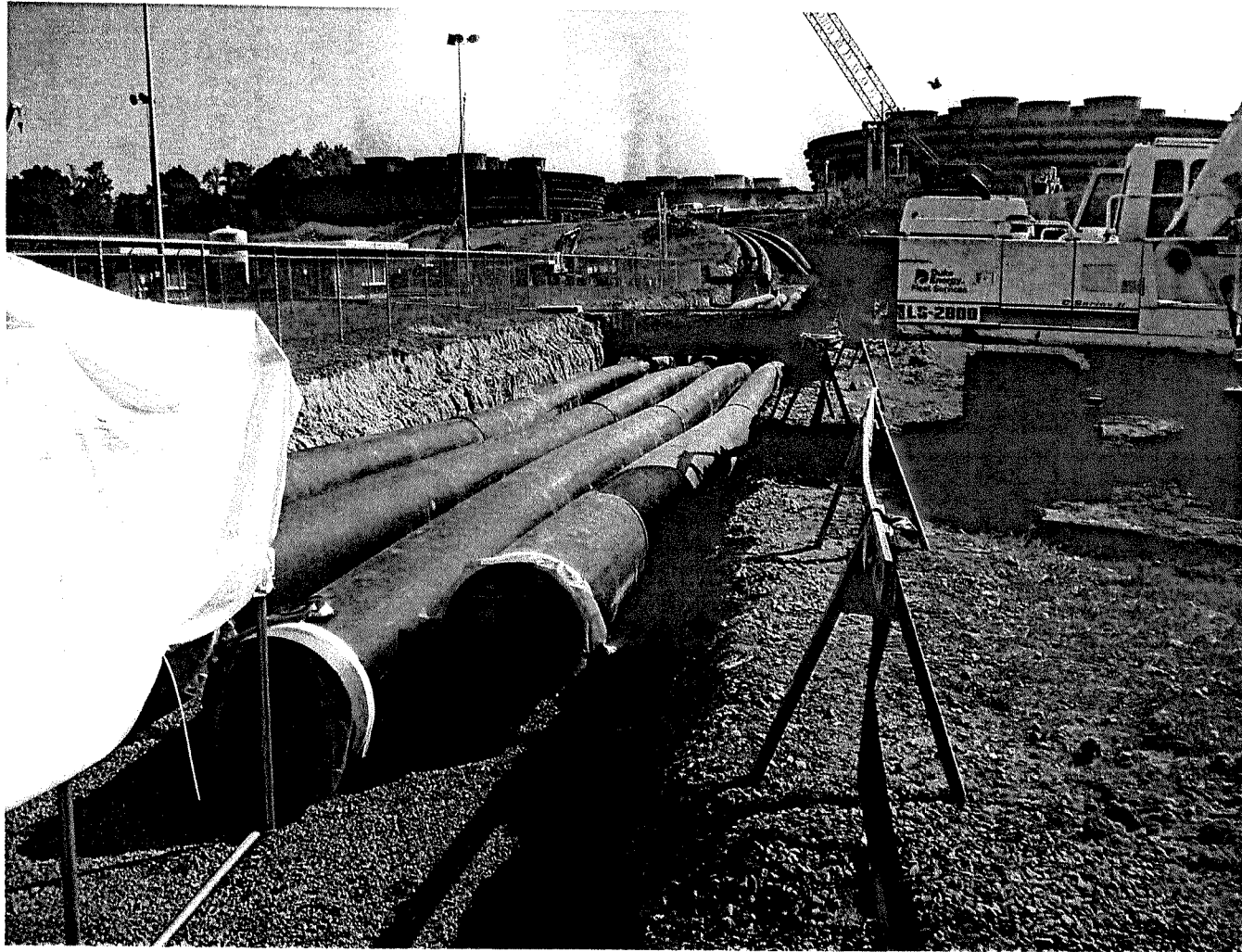
Low Pressure Service Water Supply Header Connections to Unit 1



New Low Pressure Service Water Supply and Return Piping to Containment Chillers



Low Pressure Service Water 32" HDPE Pipe Installation





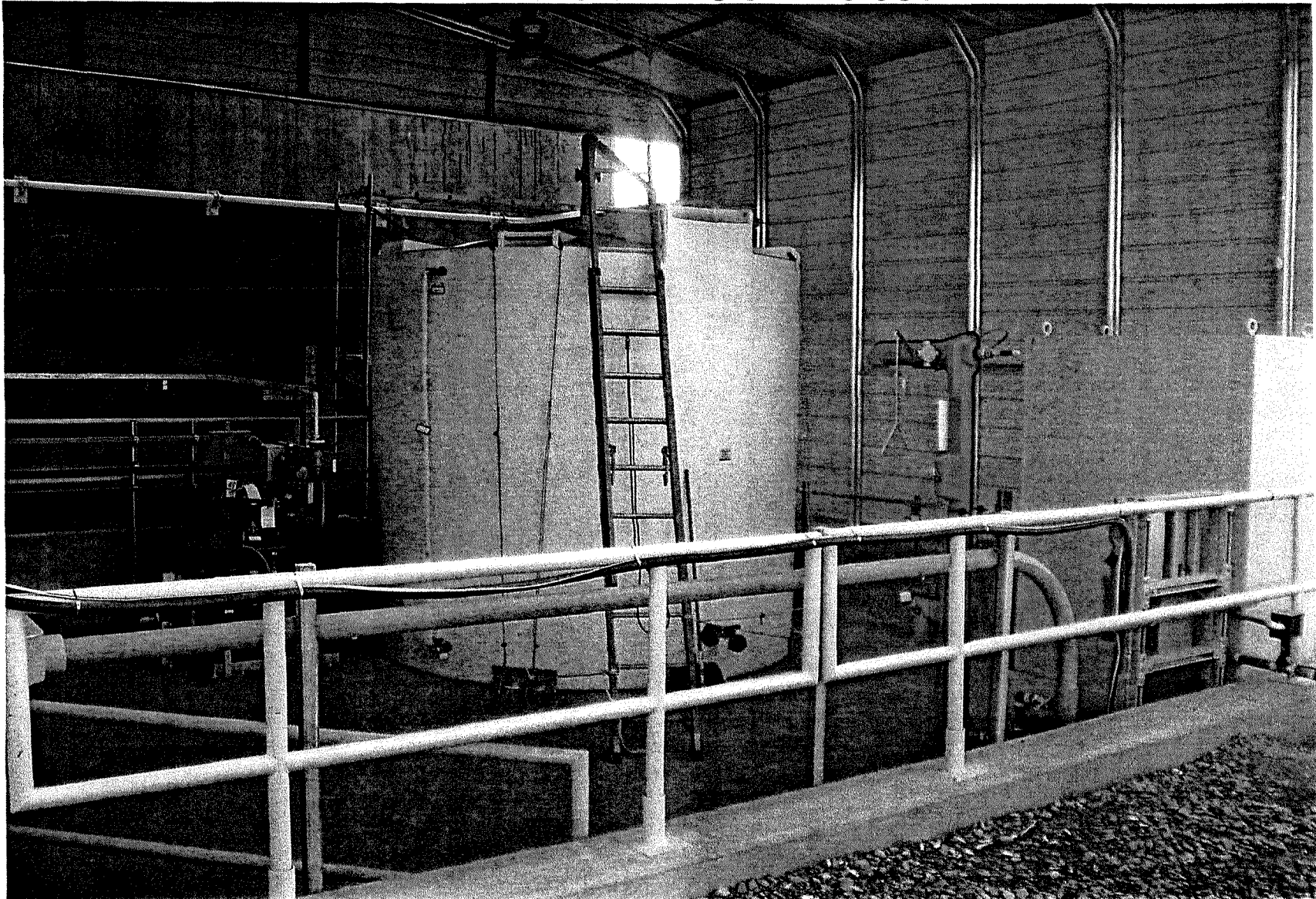
Water Treatment System

Service Water Project Status

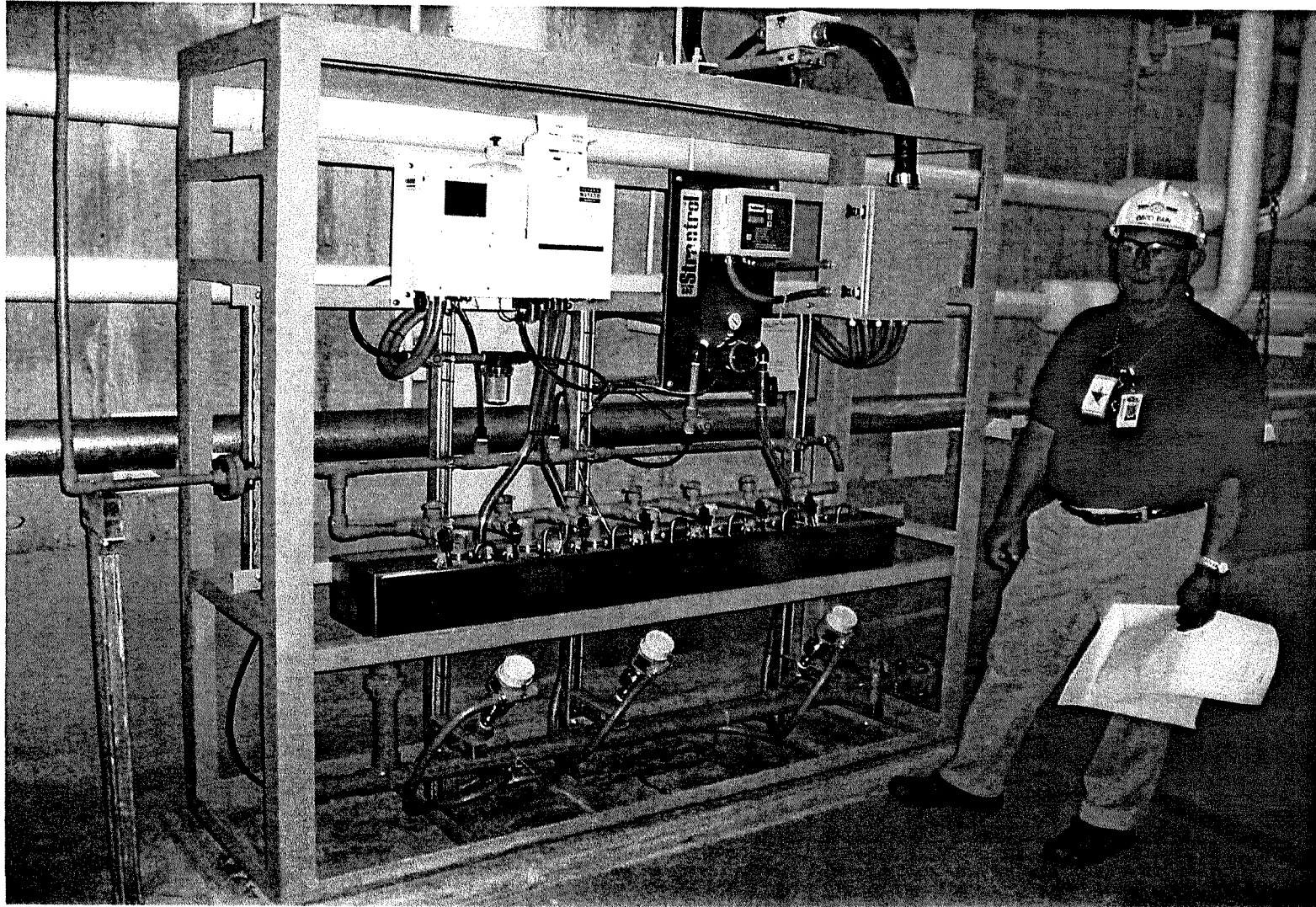
Water Treatment System

- New System to chlorinate the supply and then de-chlorinate the discharge to the lake or Standby Nuclear Service Water Pond (SNSWP)
- Allows higher concentrations of chlorine for greater biofouling control and reduced Hx Fouling
- De-chlorination prevents exceeding NPDES discharge limits
- Treats both Nuclear Service Water and Low Pressure Service Water
- Portions of System have been placed in operation
- Low Pressure Service Water Chlorination to be operational by May 2006
- Effectiveness of chemical controls for Nuclear Service water will be monitored by sample coupons

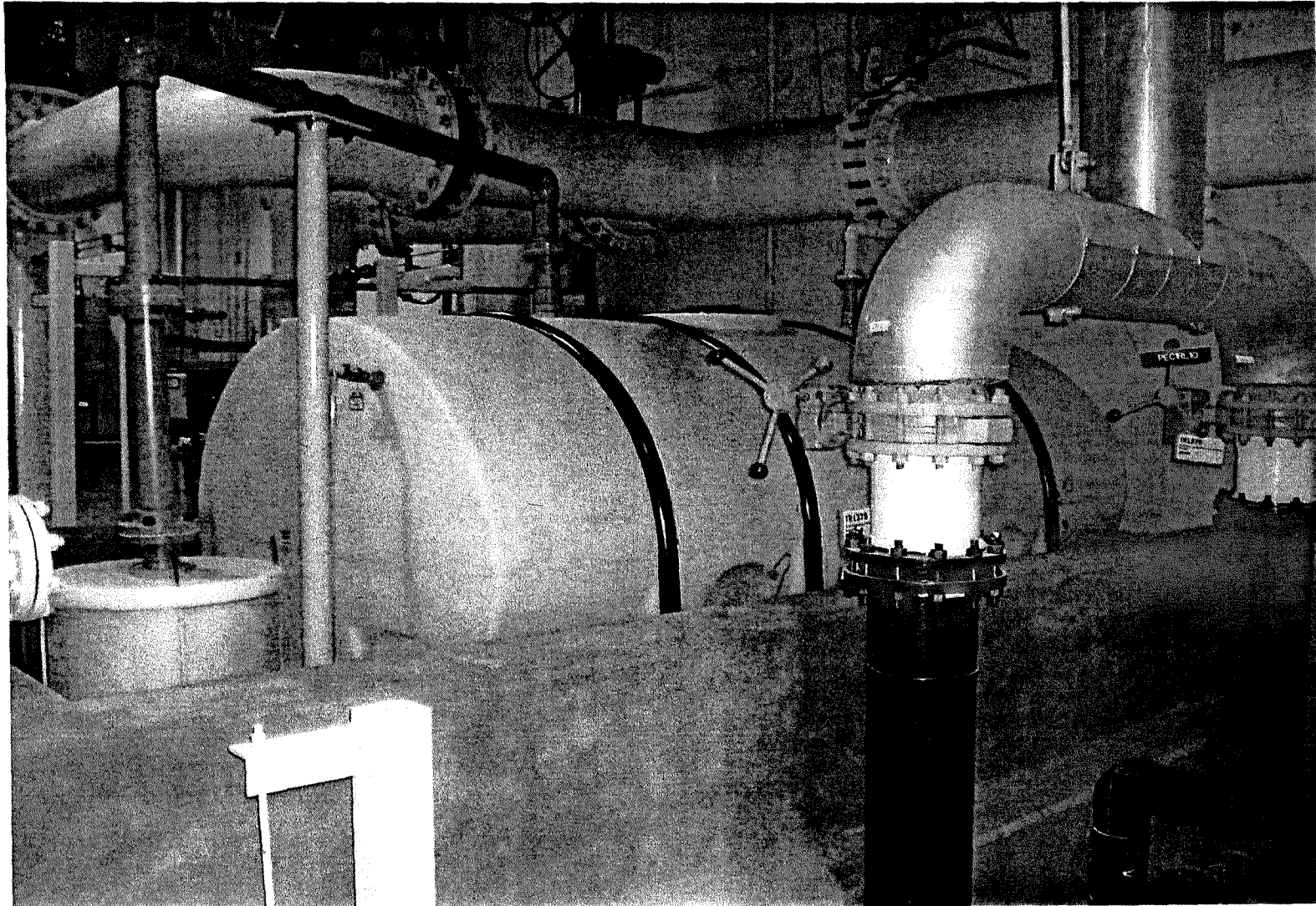
Chlorination Building For Nuclear Service Water



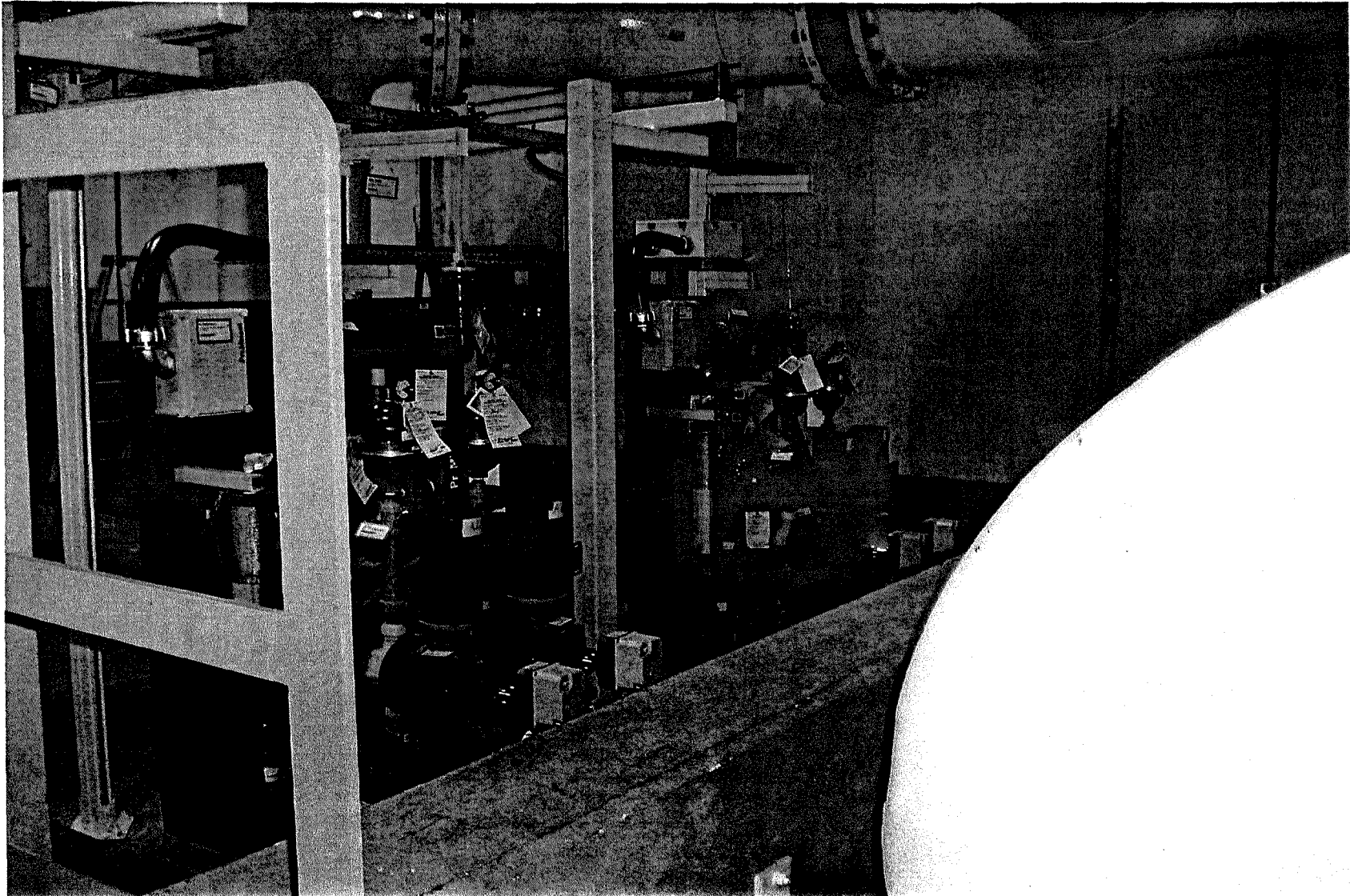
Sample Coupons



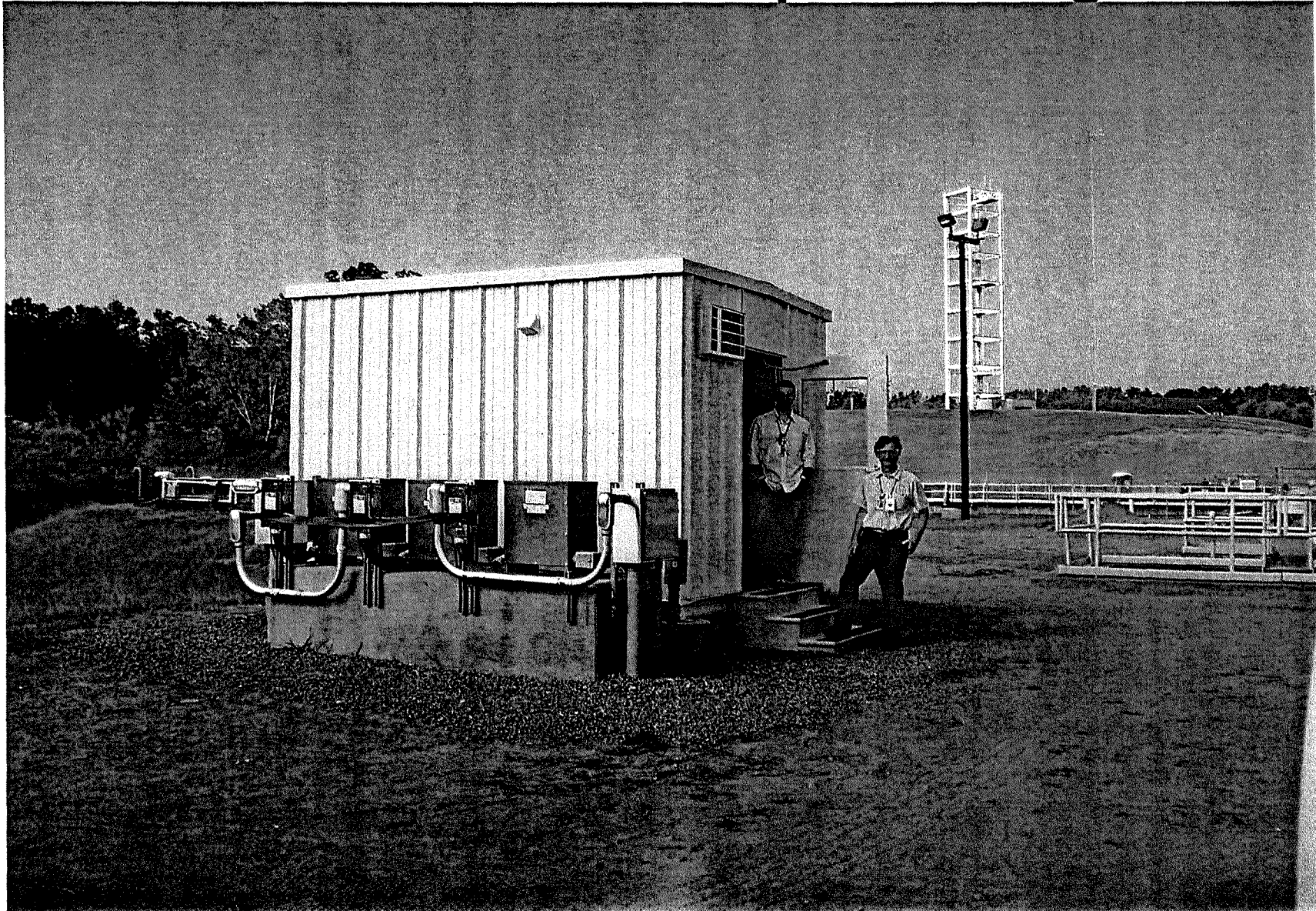
Sodium Bi-Sulfite Tank (De-Chlorination)



De-Chlorination Equipment Skids



De-Chlorination Sample Building





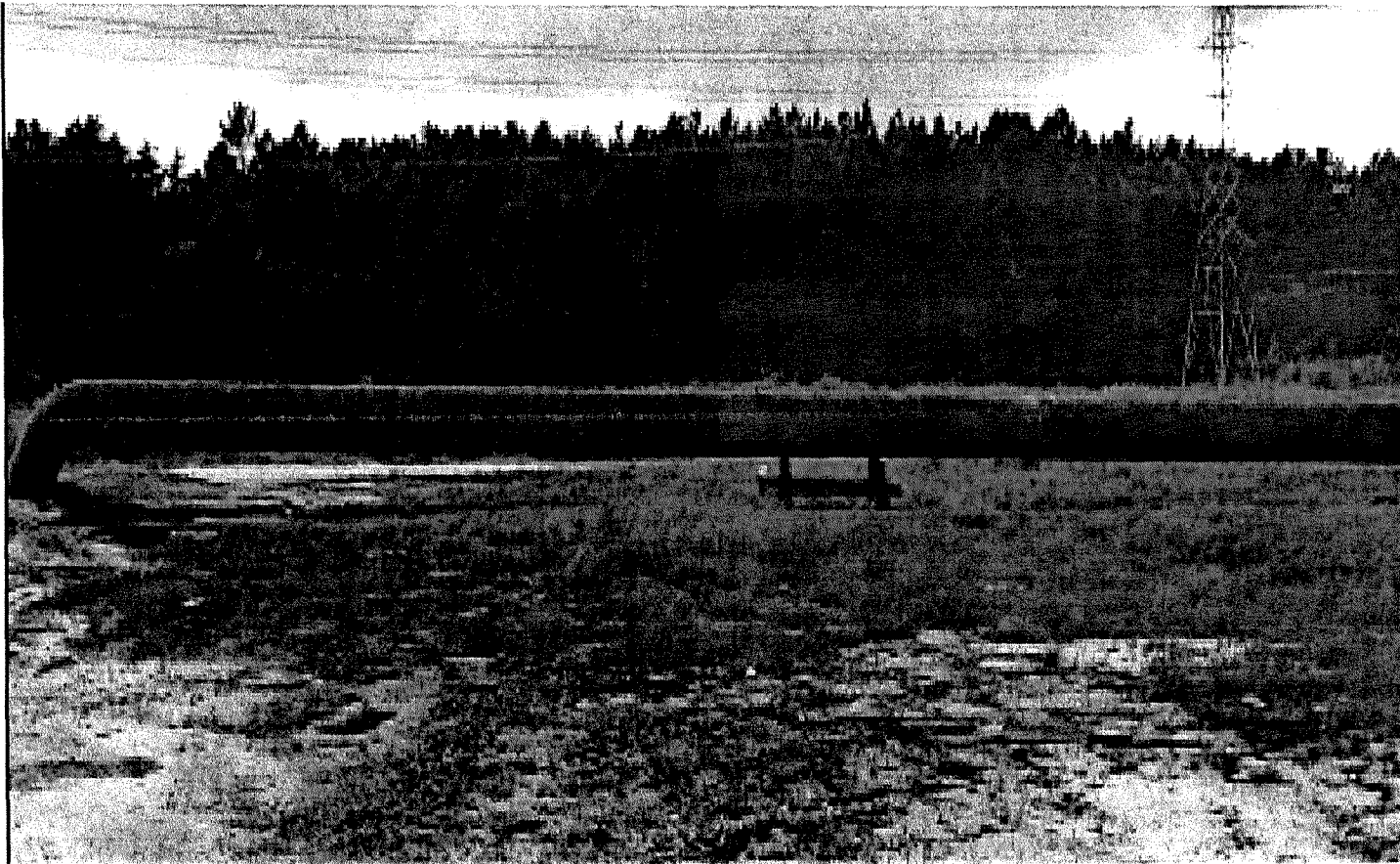
Mock-up Piping

Service Water Project Status

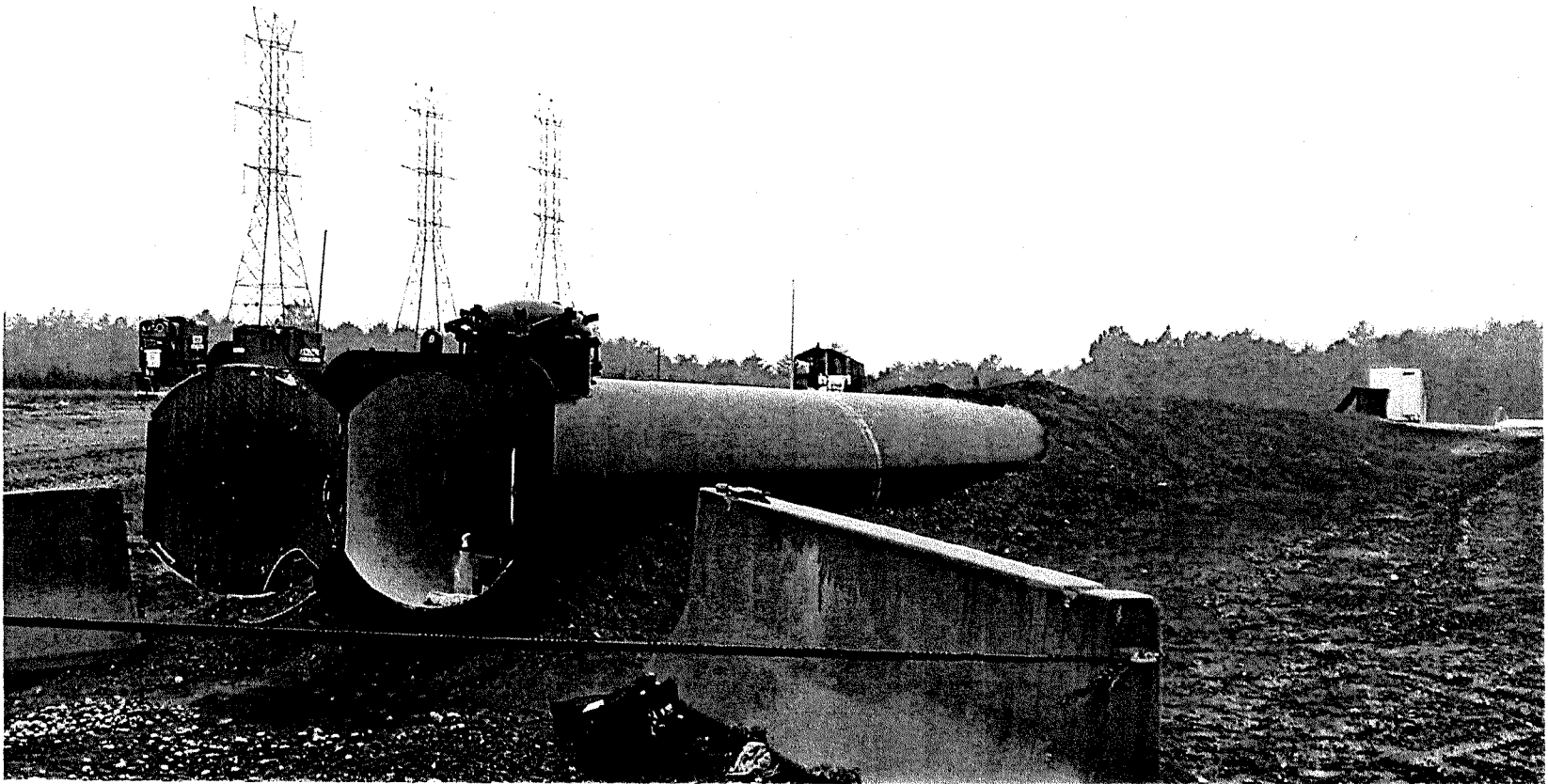
Nuclear Service Water Mock-Up Piping

- Developed mock-up piping -300 Feet of 42 inch pipe and 100 feet of 30 inch pipe
- Demonstrated Capability of Equipment
 - High Pressure Water Cleaning
 - Abrasive Blast
- Proved the clean and coat process
- Trained Craft and Inspection Personnel
- Logistical Improvements Identified
 - Handling of Coating Equipment
 - Removal of Abrasive Material
 - Sequence of Support Personnel (QC, Fire Watch, Hatch Attendant)
- Contingency plans
 - Safety Training For Medical Emergency Response Team
 - Weld Repairs

Mock-Up Piping



Mock-Up Piping



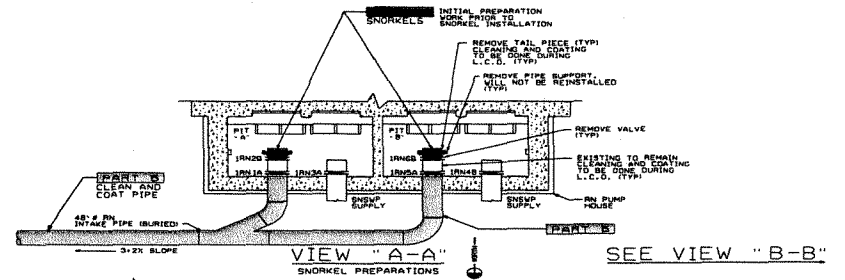
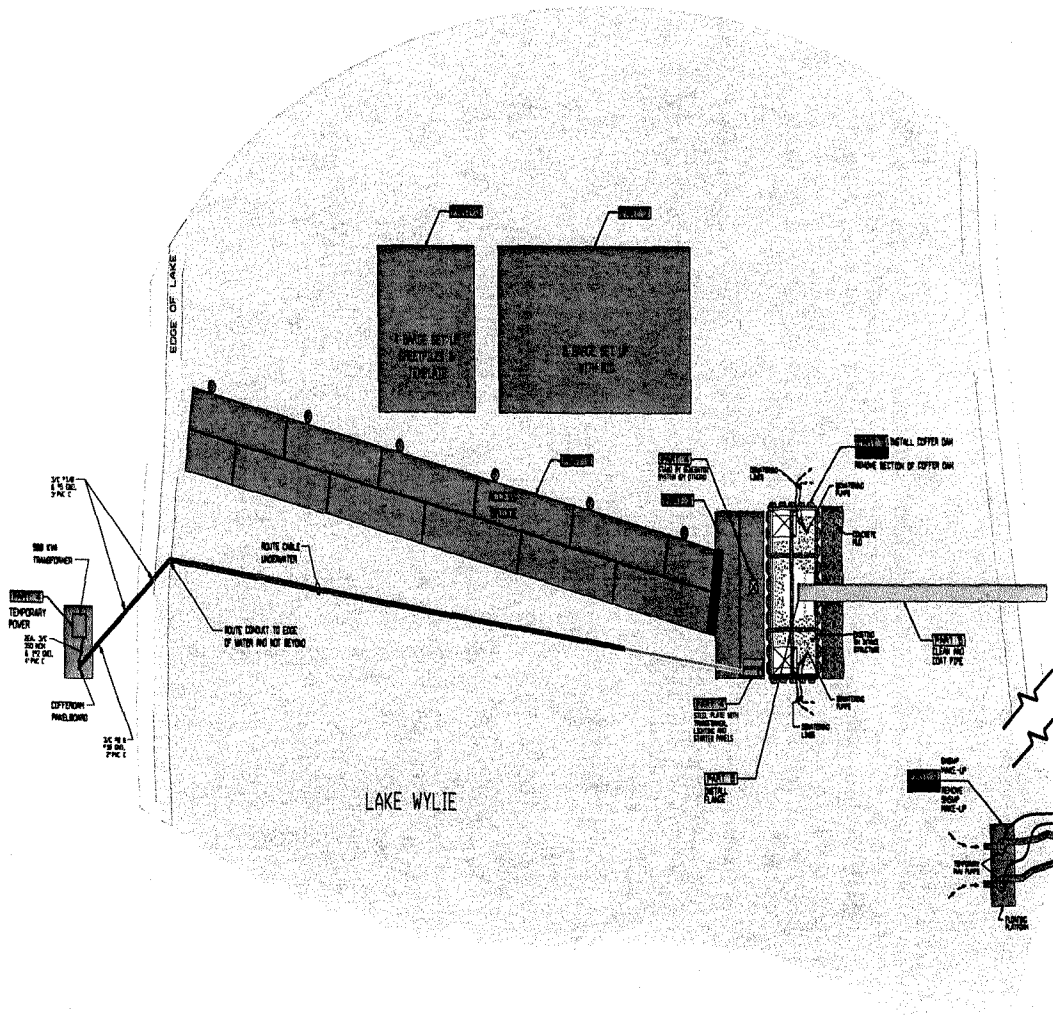


Nuclear Service Water Lake Intake Piping

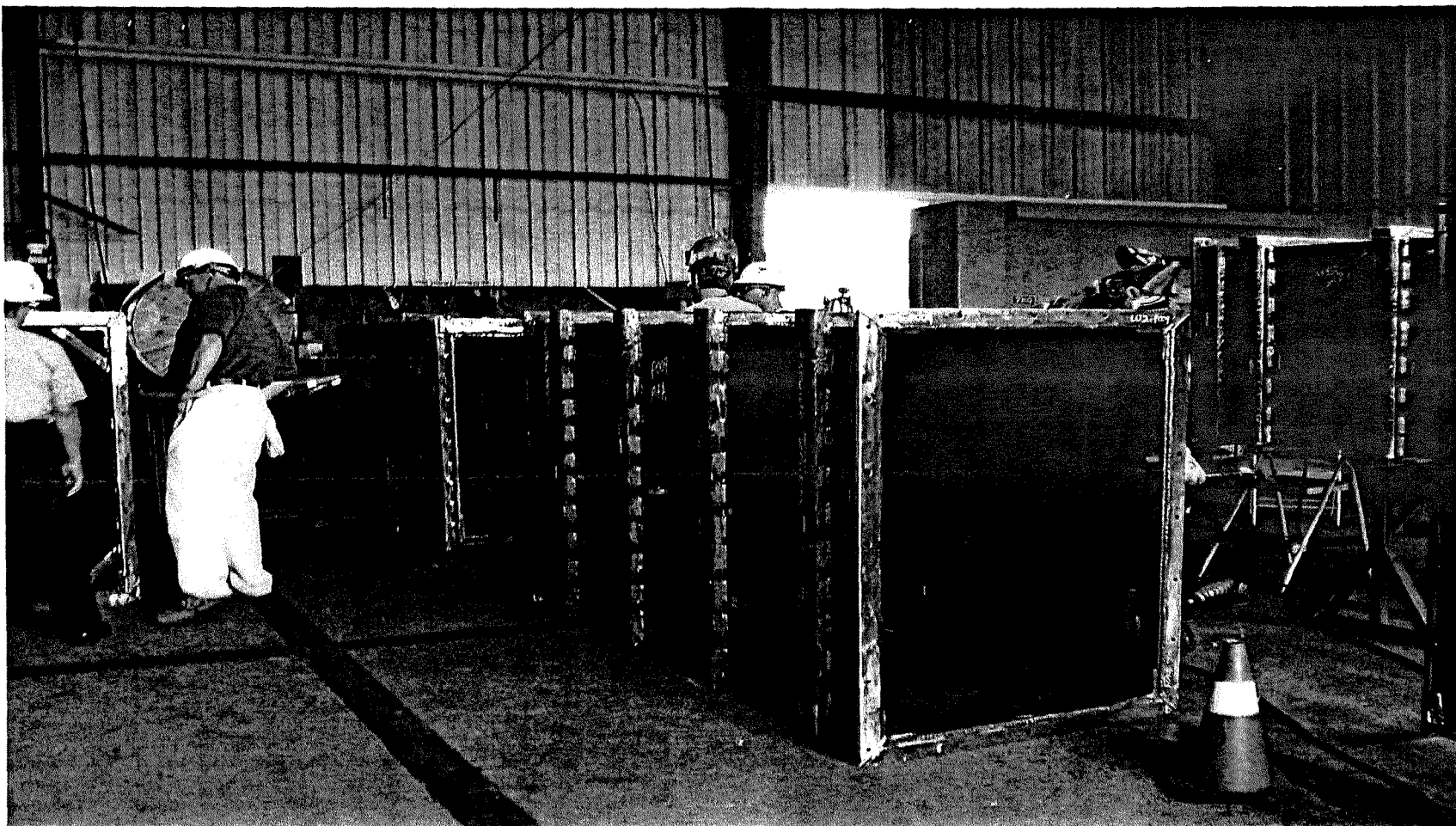
Service Water Project Status Lake Intake Piping

- Clean/Coat Nuclear Service Water Lake Intake Piping (400 feet of 48" piping)
- Built Two Snorkels in the Nuclear Service Water Pump House
- The Snorkels provide:
 - a QA1 boundary between the SNSWP & Lake Wylie while the plant uses the SNSWP for Nuclear Service Water cooling water
 - alternate access & egress path for personnel working inside the Nuclear Service Water Lake Intake Pipe
- Built Cofferdam at Lake Intake to dewater and allow access

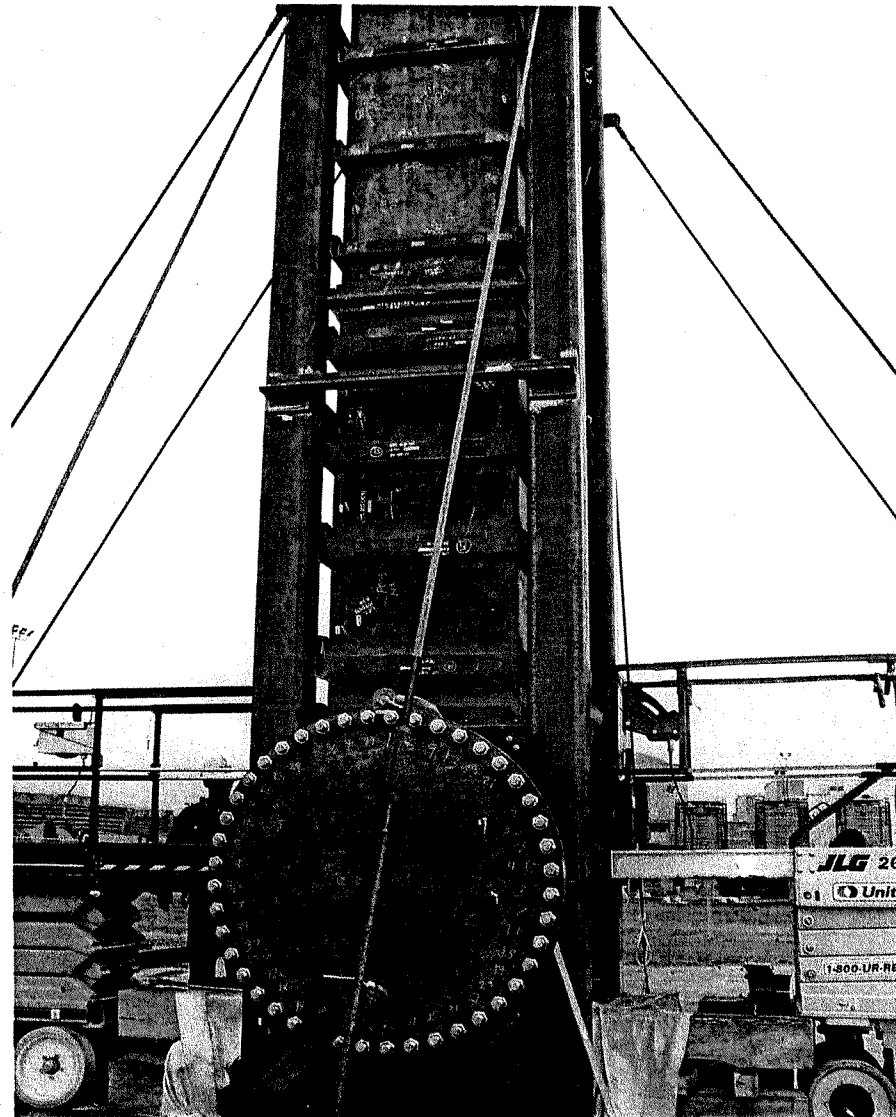
Service Water Project Status Lake Intake Piping Diagram



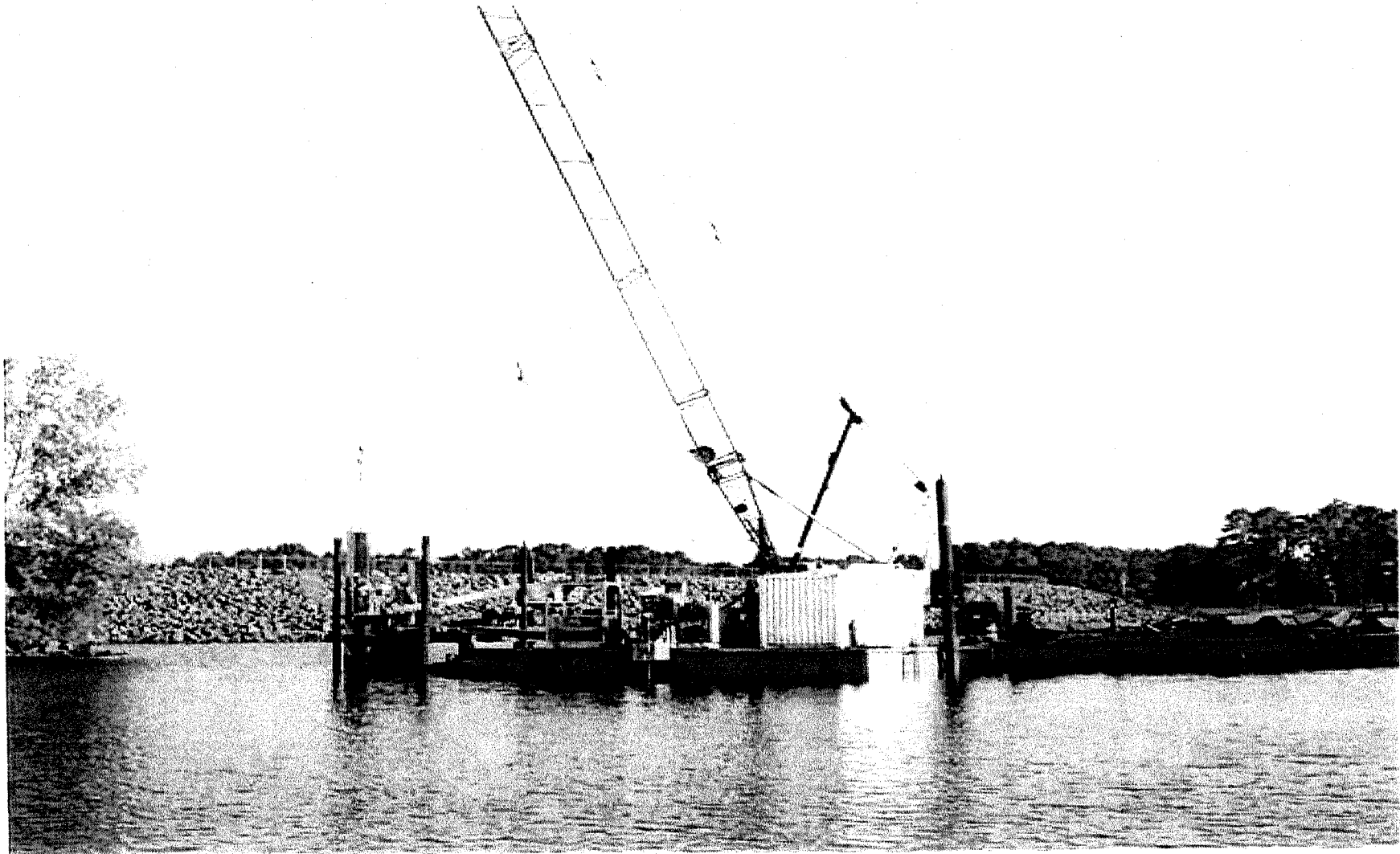
Snorkel Components Being Fabricated



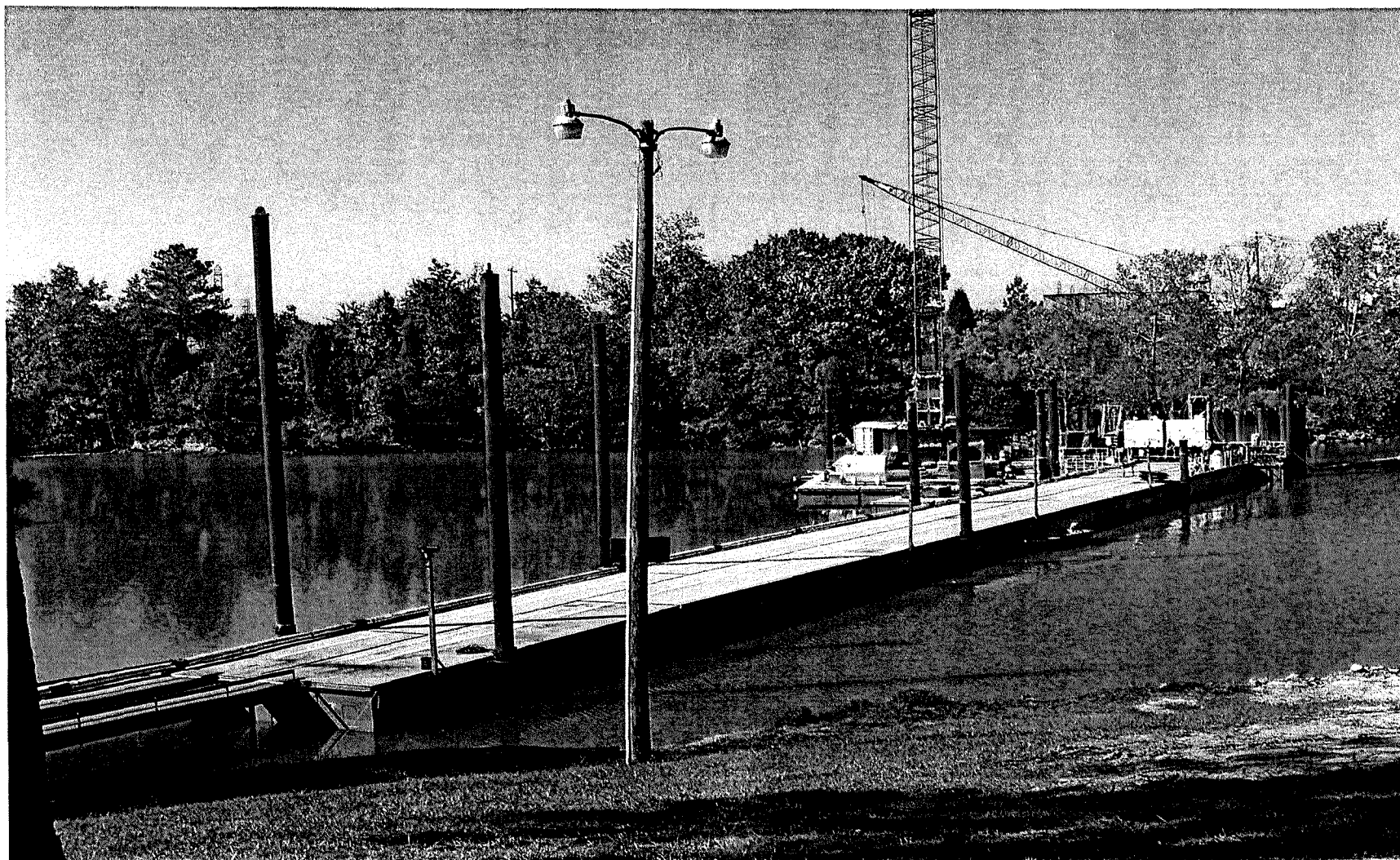
Snorkel Preassembled for Testing



Cofferdam Construction



Causeway from the Catawba Park to the Cofferdam



Cofferdam Viewed from Boat Ramp at Catawba Park



Service Water Project Status

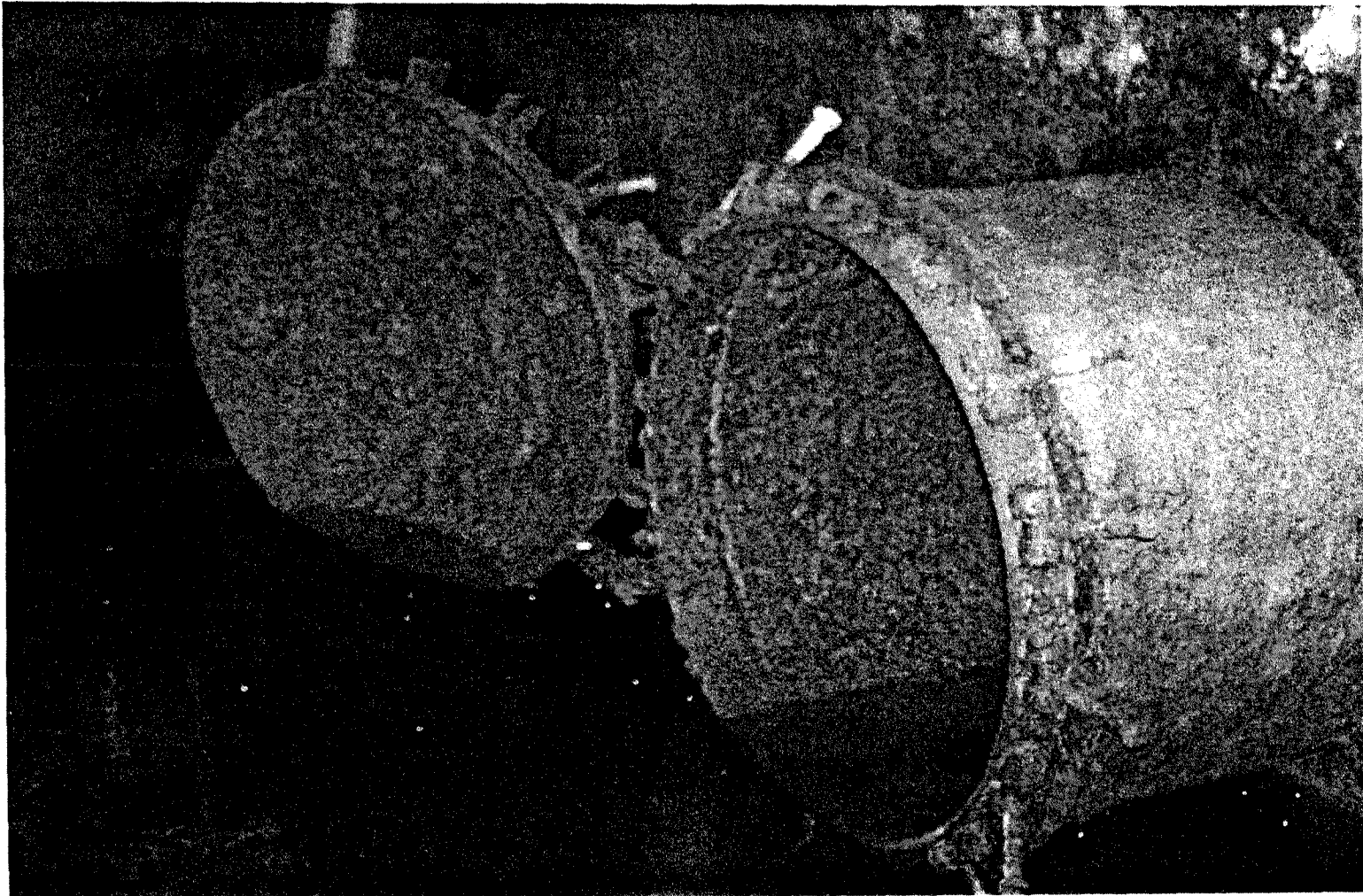
Lake Intake Piping Clean/Coat Process

- Coating material has Extensive Service History Within Nuclear Industry and Duke Power
- QA Receipt of Material and Level B Storage of Material
- Coating Manufacturer provided Training and Qualified Coating Contractor
- QA/QC Service Level 1 Inspections of Entire Process
- Process Steps
 - High Pressure Water Cleaning
 - Weld Backing Ring Removal
 - 100% Engineering Condition Inspection
 - Biocide Treatment of Welds
 - Establish Environmental Controls
 - Abrasive Blast
 - Apply 3-Coat Plastacor Coating System
 - Robotic Video Inspection

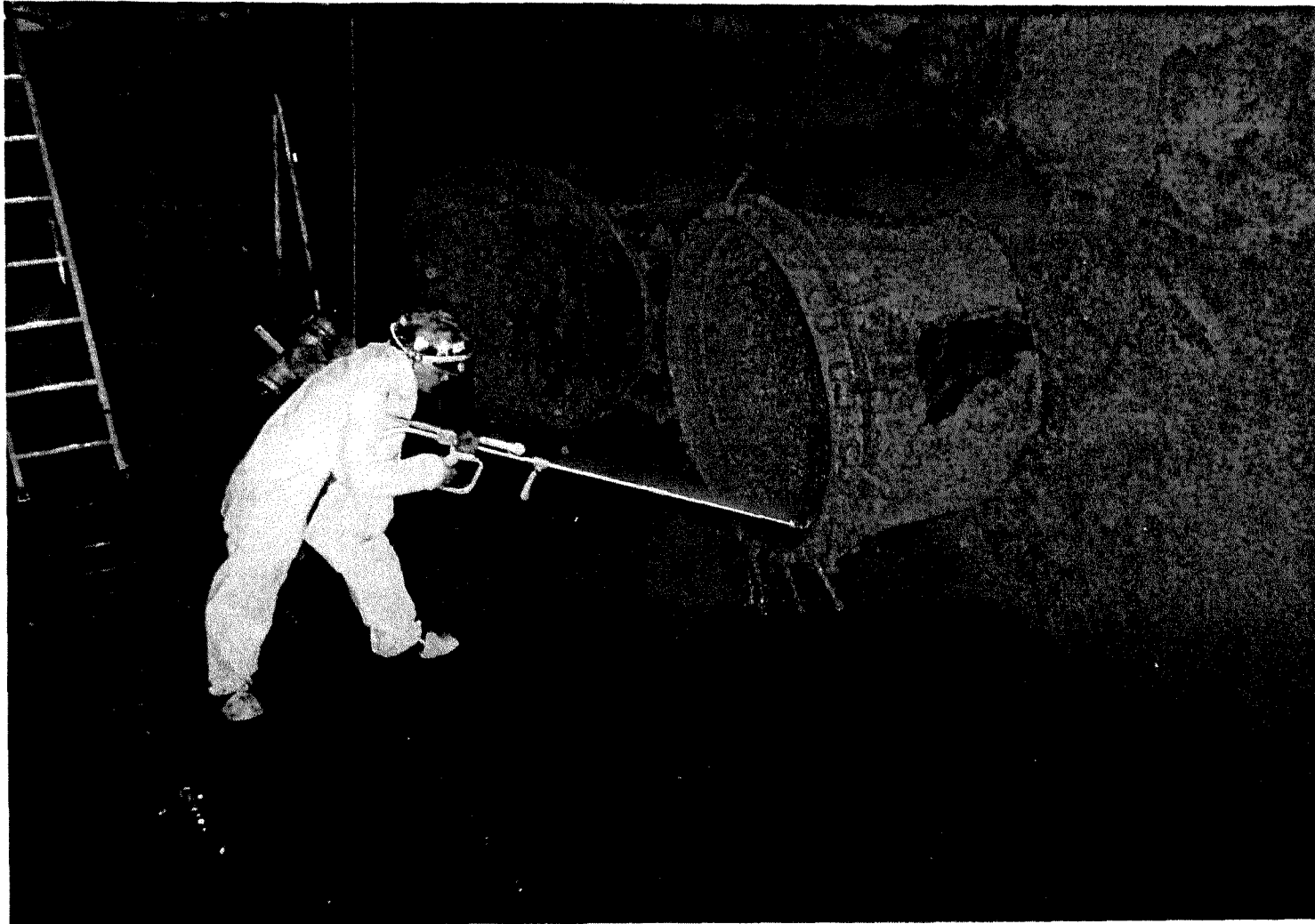
Service Water Project Status Lake Intake Piping Results

- All internal pipe and weld surfaces were inspected by a team of engineers to verify that wall thickness remained above a minimum value required by the applicable design criteria
- Engineering calculations determined that the existing piping was designed with a large amount of margin (a factor of 5) over what was required. A wall thickness of 0.625 inches piping was installed and the minimum required is 0.125 inches.
- The Engineering Inspection results indicated that ALL welds exceeded the minimum required thickness with results as follows:
 - 30 welds were considered in very good condition with less than 1/8 inch metal loss
 - 16 welds were considered in good condition with between 1/8 inch and 1/4 inch metal loss
 - 9 welds were found with localized spots of greater than 1/4 inch metal loss but still with acceptable metal wall thickness
- No repairs were necessary to restore the welds to required wall thickness

Nuclear Service Water Pipe Prior to Initial Cleaning



Nuclear Service Water Flange Initial Cleaning



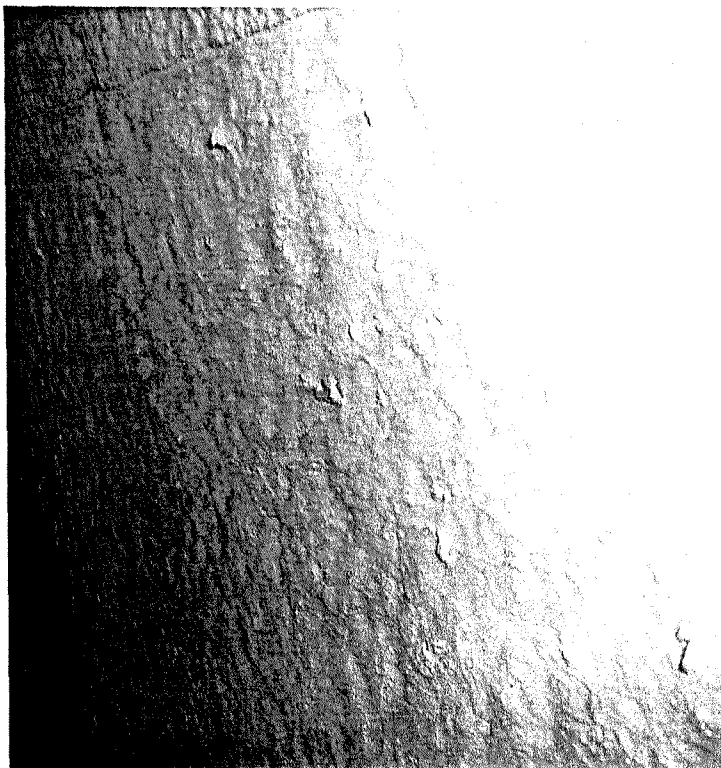
Lake Intake Pipe Before Cleaning



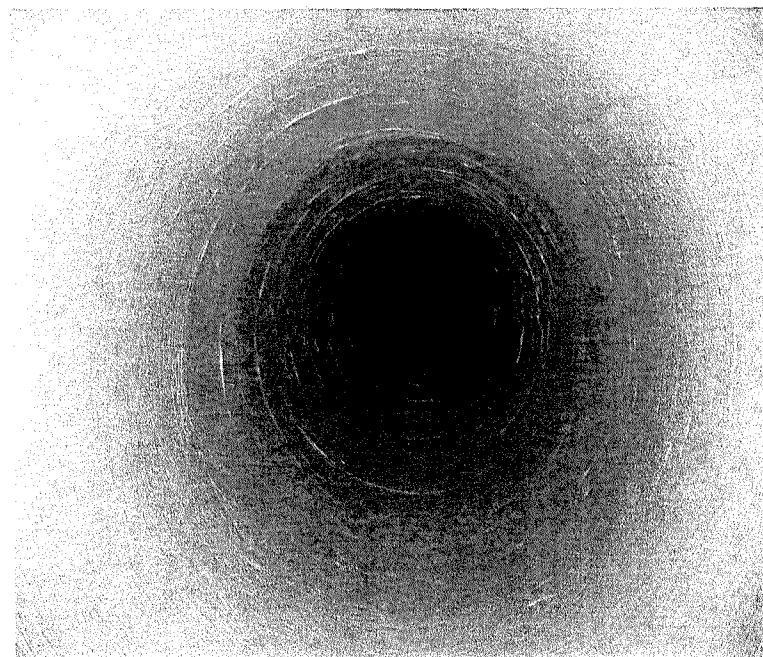
**Lake Intake Pipe After High Pressure
Water Cleaning**




Lake Intake Pipe After Abrasive Blast



Lake Intake Pipe After Final Coating





12 Day Nuclear Service Water Outages

Service Water Project Status

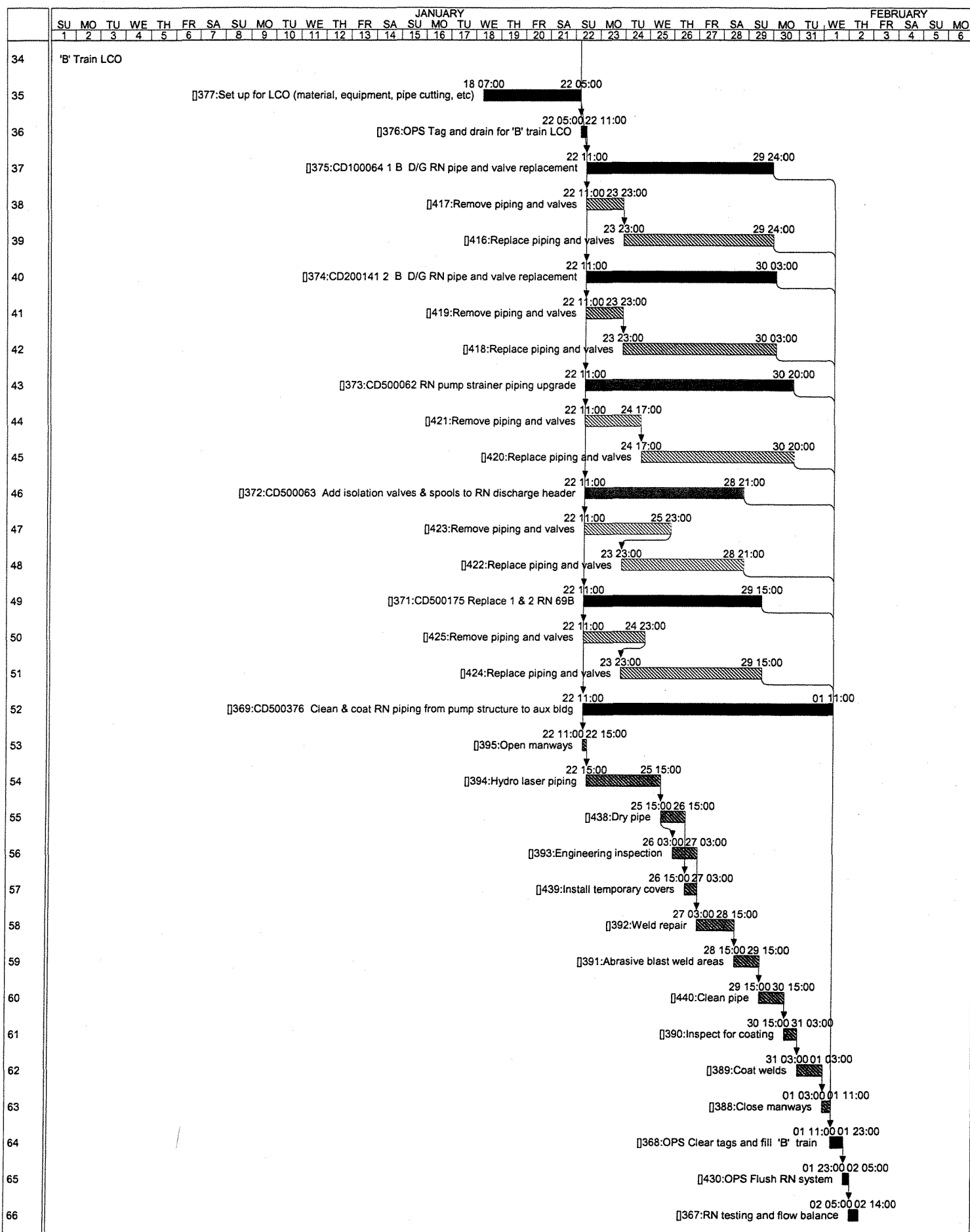
12 Day Nuclear Service Water Outages

- Two 12 Day Nuclear Service Water Outages Scheduled to Begin January 2006
- Currently Pre-fabricating Piping
- Laser Scanning Being Used to Obtain As-Built Conditions
- Work To Be Done
 - Clean/Coat Welds in Nuclear Service Water Supply Header Piping from Pump House to Auxiliary Building
 - Auxiliary building Isolation Valves and Crossover Piping
 - RN Pump House Isolation Valves and Crossover Piping
 - Diesel Generator Isolation Valves and Crossover Piping

Service Water Project Status

12 Day Nuclear Service Water Outages

- Sequence for clean/coat of welds in supply piping requires:
 - System drain
 - High Pressure Water Clean and vacuum
 - Establish Environmental Conditions
 - Engineering weld inspection and repair (as required)
 - Abrasive Blasting for surface preparation
 - QC surface prep inspection
 - QA 1 coating application (hand trowel application) of only pipe welds



Service Water Project Status

12 Day Nuclear Service Water Outages

- **Project Contingency Plans:**
 - Start Date could be delayed in case of severe weather
 - Welding resources and equipment available in case weld repairs are required
 - Additional coating equipment available
 - Coating scope reduction plan in place
 - Back-out plans for pipe replacements
 - Additional environmental control equipment available

Service Water Project Status

12 Day Nuclear Service Water Outages

- Operational Risk Mitigation Plans Include:
 - Minimize maintenance activities on opposite train equipment
 - Protect and increase monitoring of opposite train equipment
 - Affected train DGs to be maintained “available”
 - Component Cooling Water (CCW) system to be in cross train alignment during train outages
 - Continuously staff the Standby Shutdown Facility

Service Water Project Status

12 Day Nuclear Service Water Outages

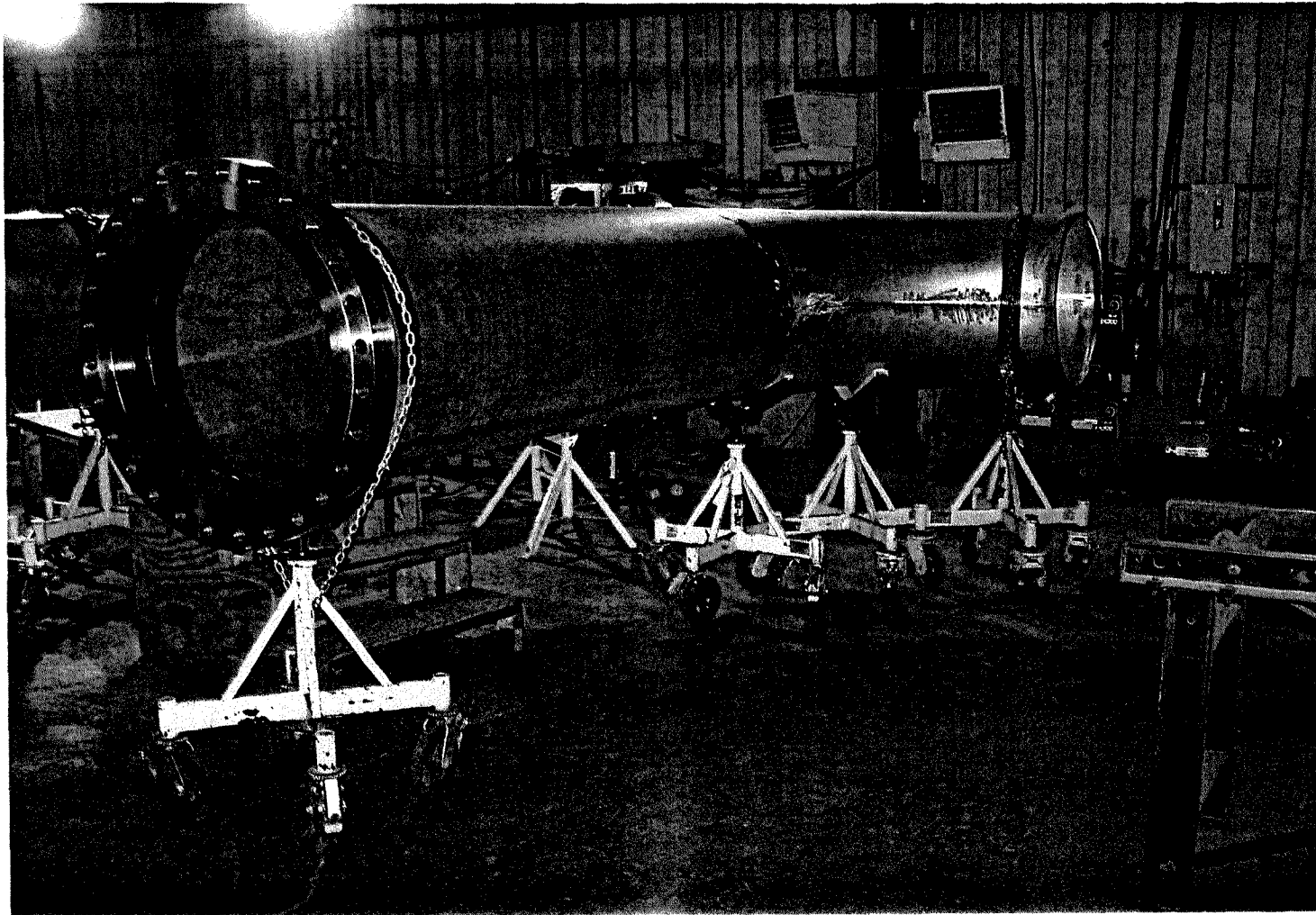
- Operational Risk Mitigation Plans Include:
 - Changes have been made to loss of power procedures to address local throttling of AFW flow
 - Changes will be made to plant procedures for the ability to cross tie the CCW headers
 - Operations use of Configuration Risk Management Program to control and limit activities at the station
 - Outage Control Center will be staffed during each train outage

Service Water Project Status

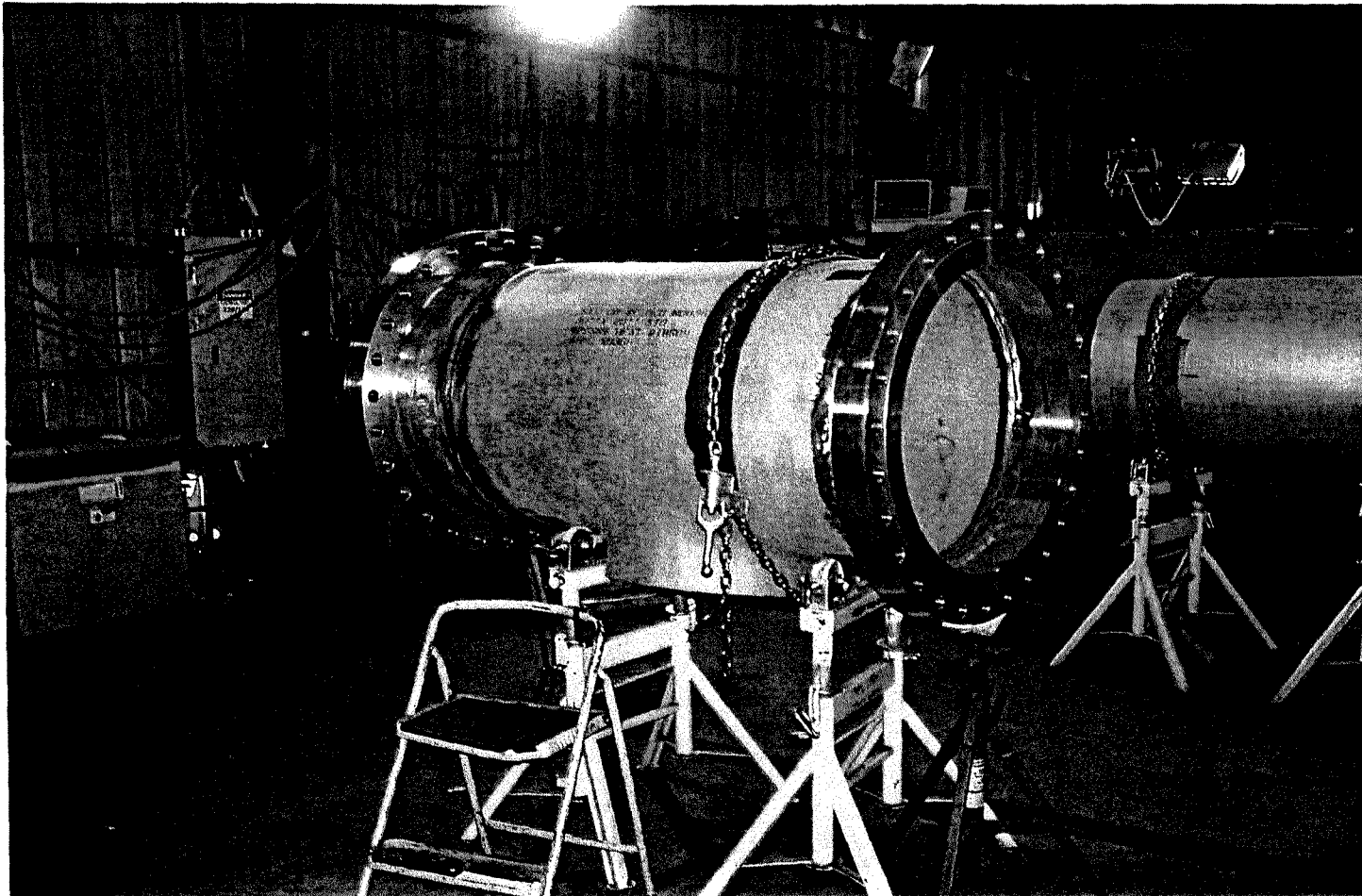
12 Day Nuclear Service Water Outages

- Operational Risk Mitigation Plans Include:
 - Operators will do just in time review of loss of service water and loss of CCW procedures
 - No maintenance will be allowed in the switchyard
 - Outage will be during the time of year with lower risk of severe weather
 - Increased focus by all plant personnel (OPS, Maintenance, Engineering and Management) due to awareness of risk significance

Pre-Fabrication of Piping For The 12 Day Nuclear Service Water Outages



Pre-Fabrication of Piping For The 12 Day Nuclear Service Water Outages





Resource Plan

SWP Resource Plan

- Resources To Support SWP:
 - \$ 285 million in projected project cost
 - Secured raw metal materials
 - 12 day outage prefab ongoing at Catawba, McGuire, and Oconee
 - 355 craft and craft supervision
 - 90 professional staff
 - 127 service contractors
 - End of year peak will be 572

SWP Resource Plan

- Contractor Oversight Improvements:
 - Initially, SWP contractor oversight did not keep pace with the rapid growth of the project organization
 - Corrective actions were implemented in response to observations and incidents
 - Improvements were made to the contractor oversight plan
 - Additional SWP oversight resources have been provided
 - Communications and integration between the SWP team and the station organization are significantly improved
 - Dedicated contacts within Operations and Work Control established for SWP
 - Management observations targeted at SWP activities increased

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