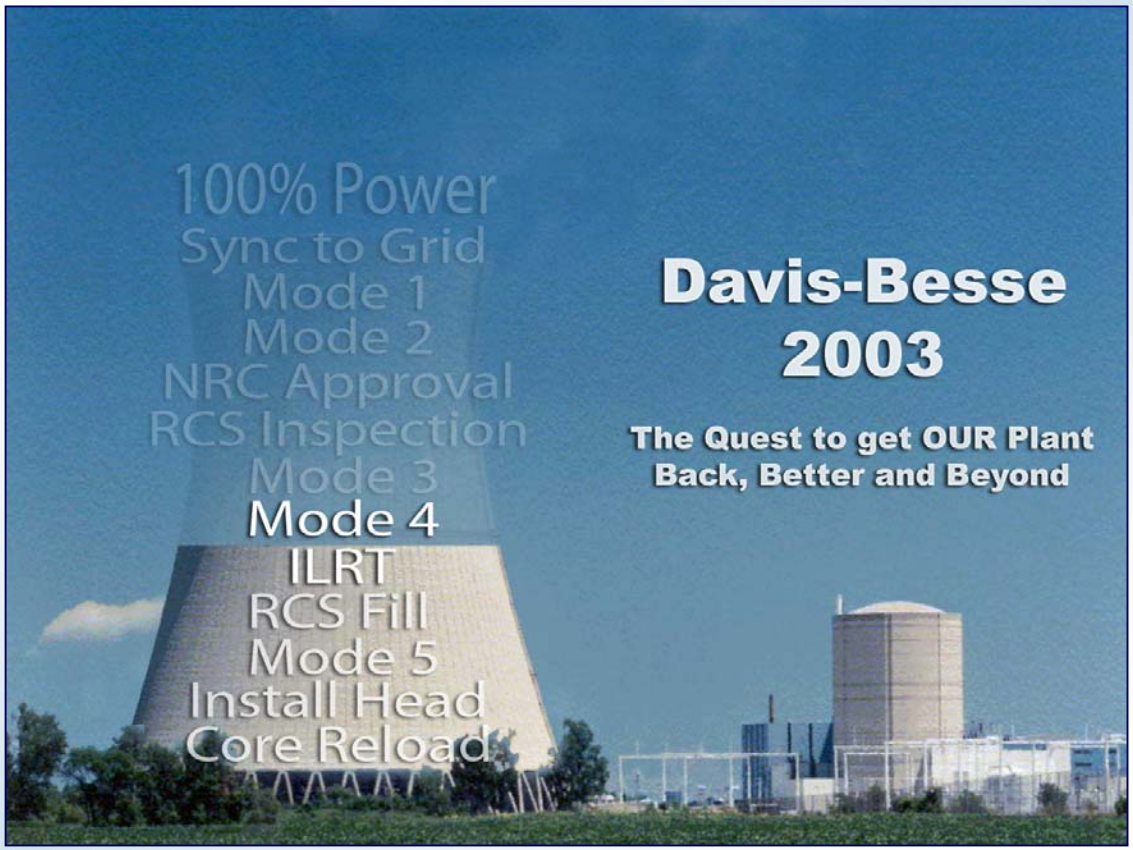
Davis-Besse Nuclear Power Station



IMC 0350 Meeting

Meeting Agenda

Operations Restart Readiness Assessments
- Operations Mode 4 Preparation, Actions for Restart…….Randy Fast
- Operations Leadership, Operability Evaluation……..Bill Pearce

Design Issue Resolution ……..……..Bob Schrauder

Containment Health……...Randy Fast

Integrated Leak Rate Test,
Resolution of Significant Plant Issues……..…….Jim Powers

Safety Culture/Safety Conscious Work Environment
- Mode 5 Safety Culture Assessment……Lew Myers
- Safety Conscious Work Environment Employee Survey……...Bill Pearce

Major Milestones/Bulk Work
- Milestone Progress, Modifications, Work, Resources……Mike Stevens
- Restart Action Performance……..…..……..Clark Price

Operations Mode 4 Preparation, Actions for Restart

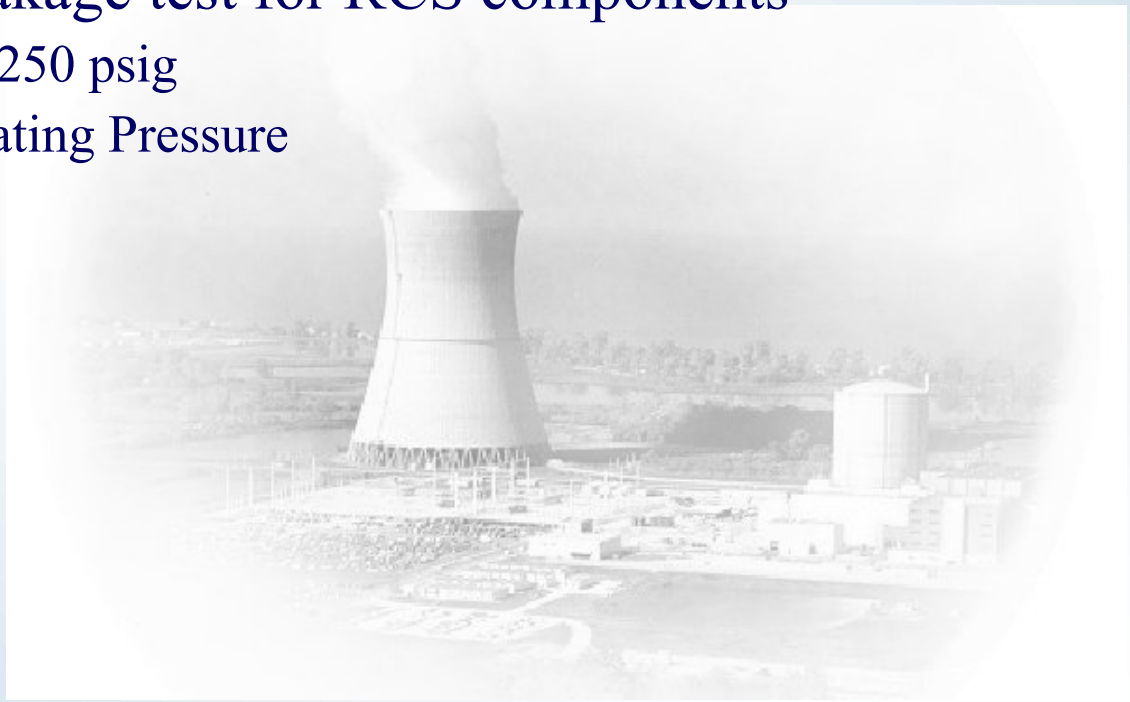
Randy Fast
Plant Manager

Operations Mode 4 Preparation, Actions for Restart

- **Actions and Preparation**
  - Appropriately staffed
  - Completed annual requalification later 2002
  - "Just in time" license requalification training
  - Reactor Operator/Senior Reactor Operator pipeline
  - Procedures ready for test plan
  - INPO/industry evaluations ongoing
  - Completed Safety Conscious Work Environment training for all Operations staff
  - Implemented Operations Leadership Plan
  - Key staff retrained on operability determination
  - Implemented Standards and Expectations

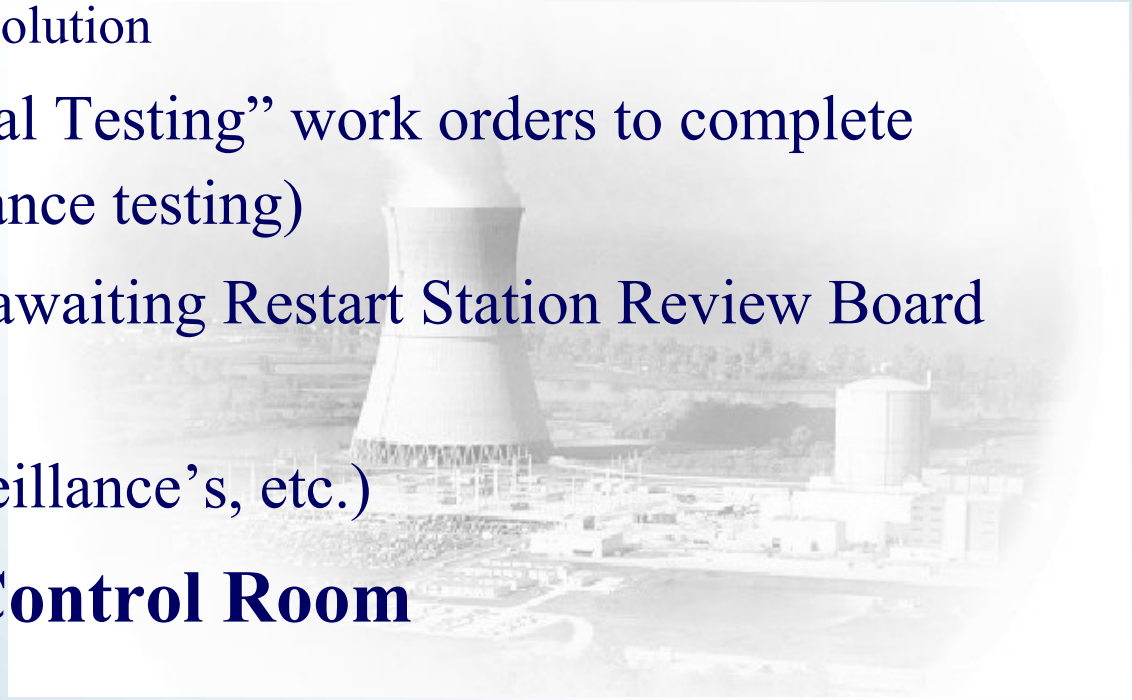
Operations Mode 4 Preparation, Actions for Restart

- **Mode 4 and Mode 3 Tests**
  - Reactor Coolant System (RCS) pressure walkdown at 50 psig
  - Augmented leakage test for RCS components
    - Performed at 250 psig
    - Normal Operating Pressure



Operations Mode 4 Preparation, Actions for Restart

- **Restraint Data; 4-15-03**
  - 429 Condition Reports Restraints
    - 395 awaiting mode hold resolution approval
    - 34 require resolution
  - 355 "Additional Testing" work orders to complete (post-maintenance testing)
  - 304 restraints awaiting Restart Station Review Board disposition
  - 50 other (surveillance's, etc.)
- **Oversight of Control Room**



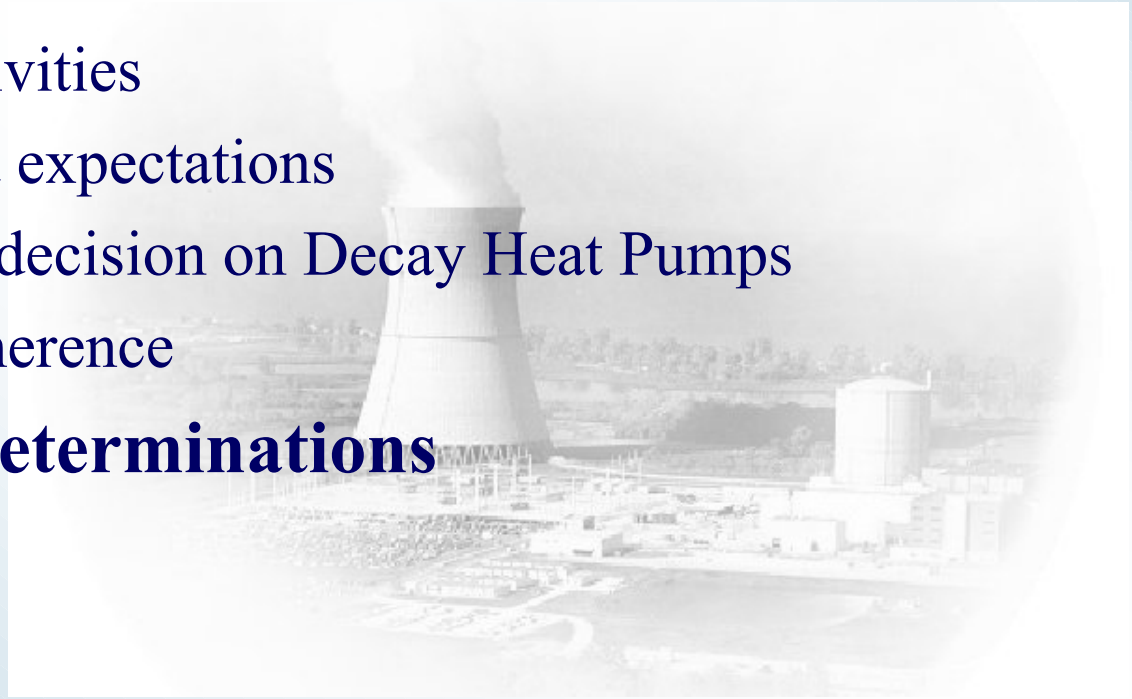
Operations Leadership and Operability Evaluation

Bill Pearce

Vice President - FENOC Oversight

Operations Leadership and Operability Evaluation

- **Operations Overview**
  - Operational activities
  - Shift turnovers
  - Clearance activities
  - Standards and expectations
  - Conservative decision on Decay Heat Pumps
  - Procedure adherence
- **Operability Determinations**

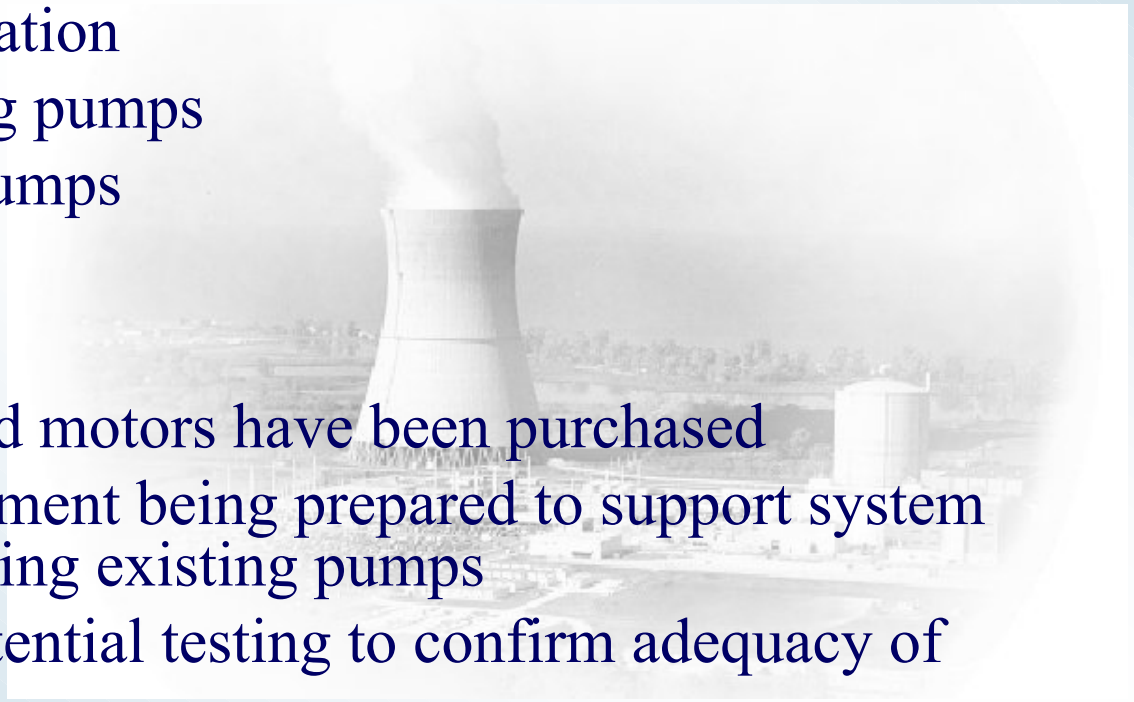


Design Issue Resolution

Bob Schrauder
Director - Support Services

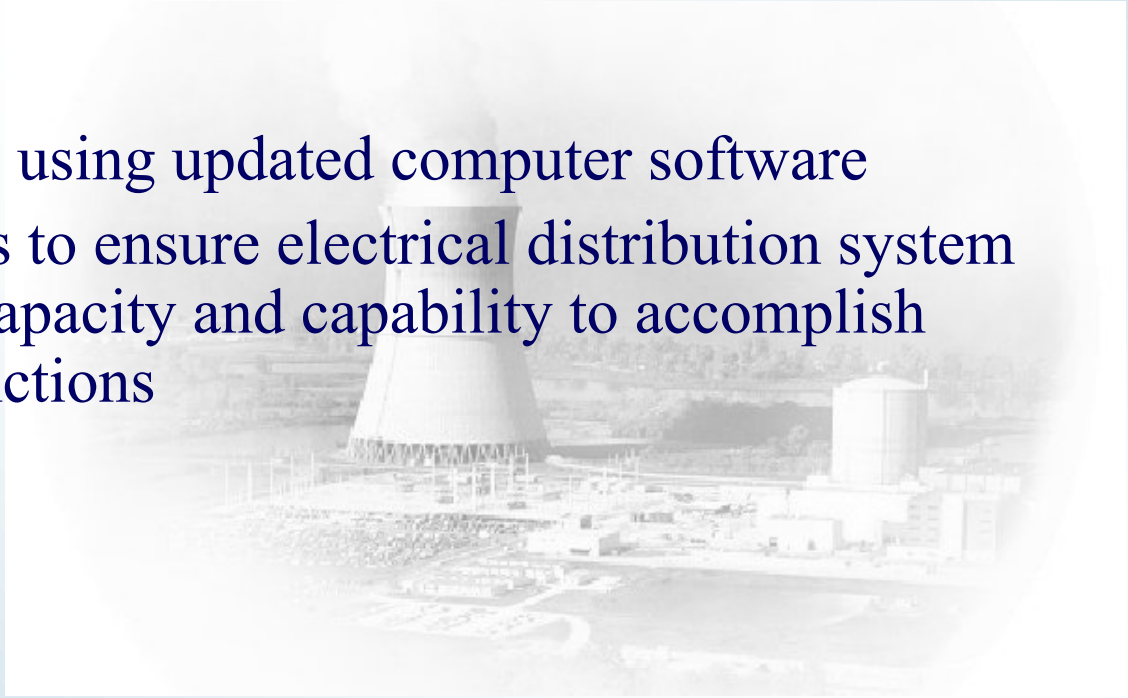
Design Issue Resolution
High Pressure Injection Pumps

- **Issue**
  - Fine debris in sump could result in damage to pumps during recirculation mode
- **Resolution Options**
  - Additional filtration
  - Modify existing pumps
  - Test existing pumps
  - Replace pumps
- **Current Status**
  - New pumps and motors have been purchased
  - License amendment being prepared to support system pressure test using existing pumps
  - Developing potential testing to confirm adequacy of existing pumps



Design Issue Resolution
Electrical Distribution System

- **Issue**
  - A number of condition reports which challenge assumptions and completeness of analysis for electrical distribution system
- **Resolution**
  - Revise analysis using updated computer software
  - Evaluate results to ensure electrical distribution system has sufficient capacity and capability to accomplish plant safety functions



Design Issue Resolution
Air Operated Valves

- **Issue**
  - Several Air Operated Valves (AOVs) have design basis issues
- **Resolution**
  - 53 demonstrate sufficient margin
  - 6 to be adjusted prior to restart
  - 12 to be modified prior to restart
  - 12 to have margin increased post restart

Design Issue Resolution
Emergency Diesel Generator (EDG) Loading

- **Issue**
  - EDG load table not current
  - EDG starting voltage and frequency response
- **Resolution**
  - Revise EDG load calculation
  - Prepare transient analysis for EDG voltage and frequency response
  - Evaluate impact of EDG voltage and frequency response on plant safety functions
  - Evaluate results to ensure EDG has sufficient capacity and capability to start and carry design basis loads

Containment Health

Randy Fast
Plant Manager

Containment Health

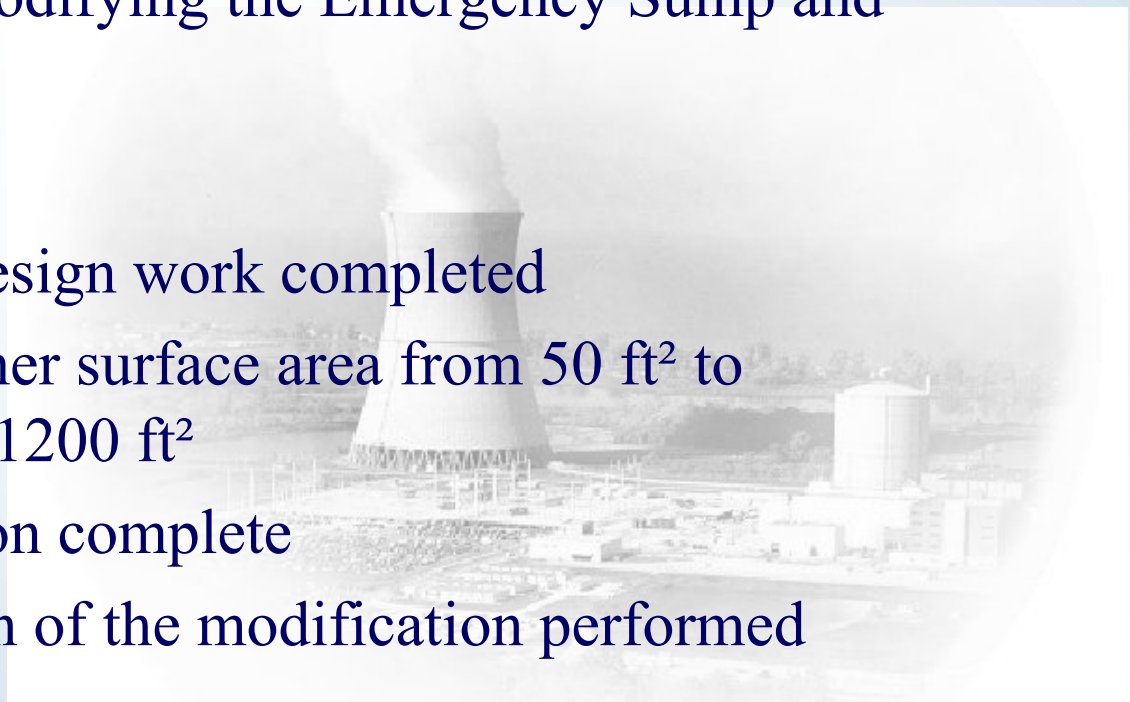
Project Scope:

- Emergency Sump
- Containment Coatings
- Decay Heat Valve Tank
- Containment Air Coolers
- Fuel Integrity
- Environmentally Qualified Equipment
- Refueling Transfer Canal
- Containment Vessel
- Boric Acid Extent of Condition Inspections, Evaluations, and Corrective Actions

Containment Health

Emergency Sump

- **Purpose**:
  - Ensure adequate long-term core cooling by significantly modifying the Emergency Sump and Strainers
- **Status:**
  - Engineering Design work completed
  - Increased strainer surface area from 50 ft^2 to approximately 1200 ft^2
  - Field Installation complete
  - NRC inspection of the modification performed



Containment Health

Access Hatch and Upper Strainer

Containment Health

Lower
Emergency
Sump Strainer

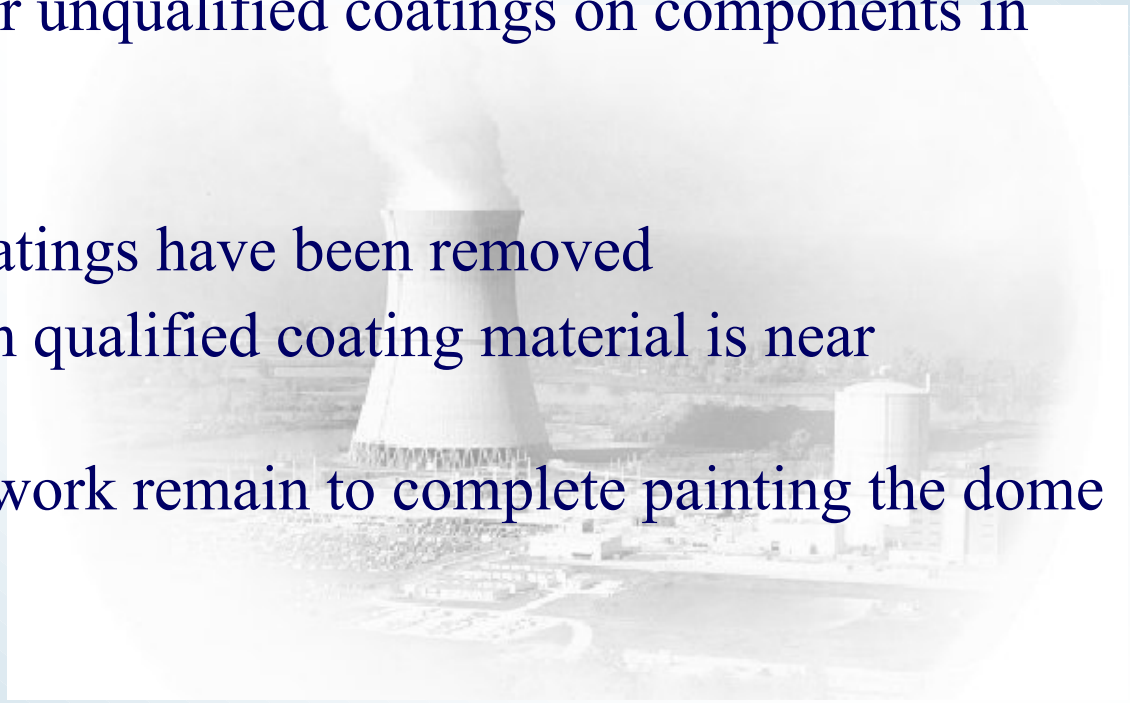
Containment Health

Debris Screen Gate

Containment Health

Containment Coatings

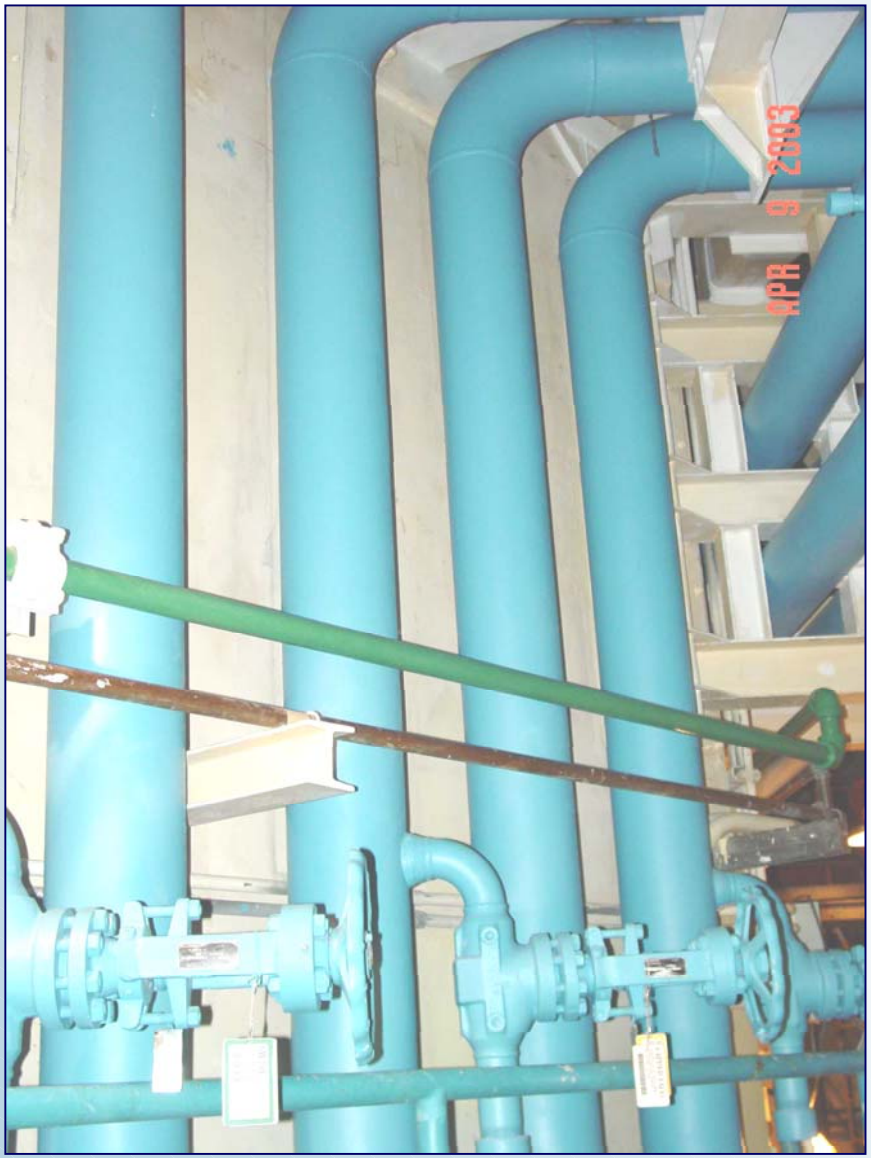
- **Purpose:**
  - Ensure adequate long-term core cooling by removing degraded and/or unqualified coatings on components in Containment
- **Status:**
  - All targeted coatings have been removed
  - Repainting with qualified coating material is near completion
  - Two weeks of work remain to complete painting the dome



Containment Health

Core Flood Tank

Containment Health



Service Water Piping and New Tags

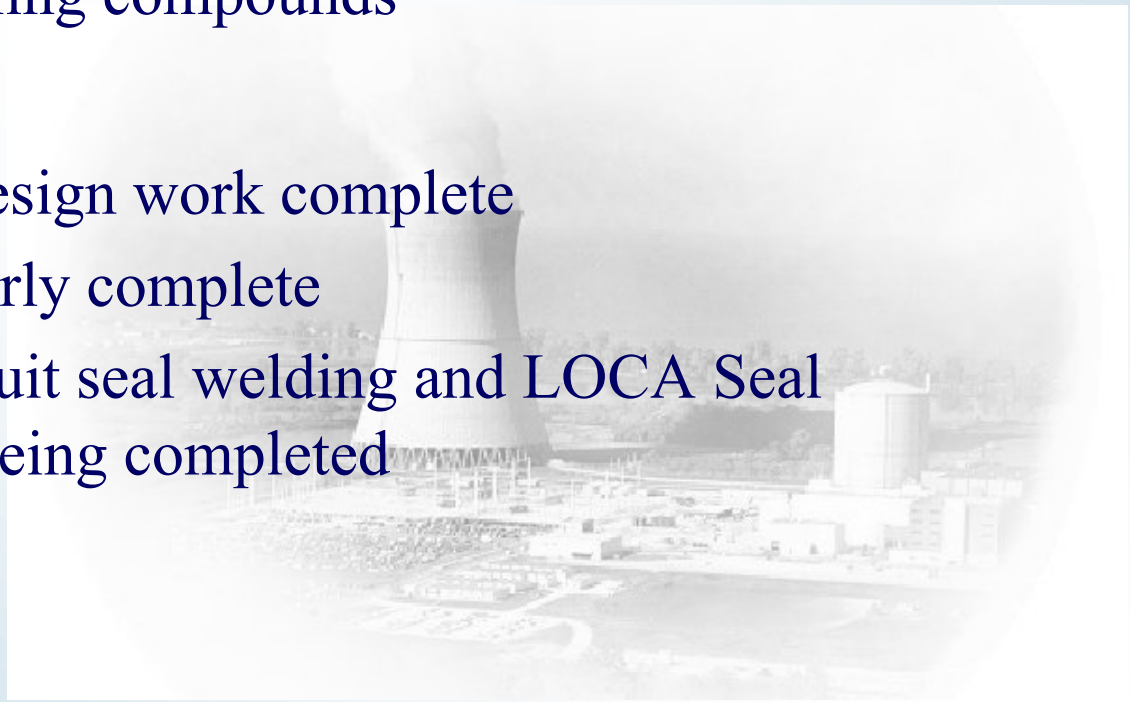
Containment Health

Containment Dome

Containment Health

Decay Heat Valve Tank

- **Purpose:**
  - Ensure the integrity of the compartment without reliance on sealing compounds
- **Status:**
  - Engineering Design work complete
  - Installation nearly complete
  - Electrical conduit seal welding and LOCA Seal installation is being completed



Containment Health

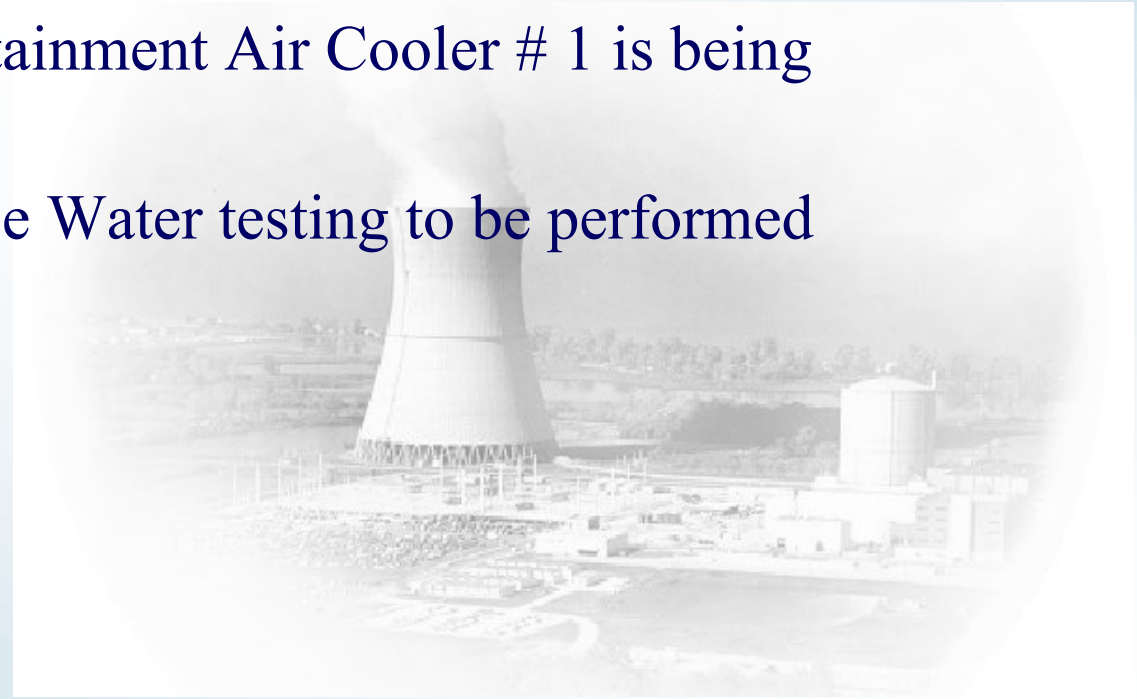
Containment Air Coolers

- **Purpose:**
  - Replace components damaged by exposure to boric acid
  - Replace two fan motors due to a Part 21 issue
- **Status:**
  - Fan motors have been replaced
  - Fans, dampers, ductwork, and instrumentation have been cleaned, refurbished, and/or replaced, as appropriate
  - Fan inlet plenum has been completely rebuilt
  - Service water piping to cooling coils has been redesigned and replaced

Containment Health

Containment Air Coolers

- **Status** (Continued)
  - Physical work nearly complete
  - Piping to Containment Air Cooler # 1 is being reworked
  - Air and Service Water testing to be performed



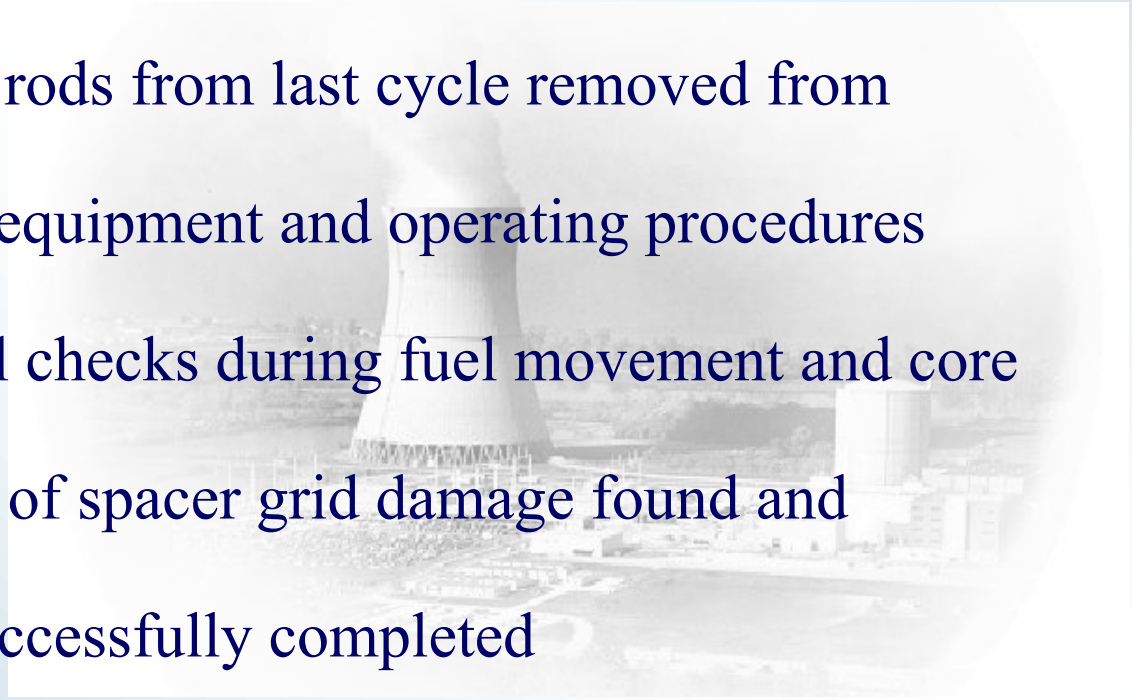
Containment Health

Containment Air Cooler #3

Containment Health

Fuel Integrity

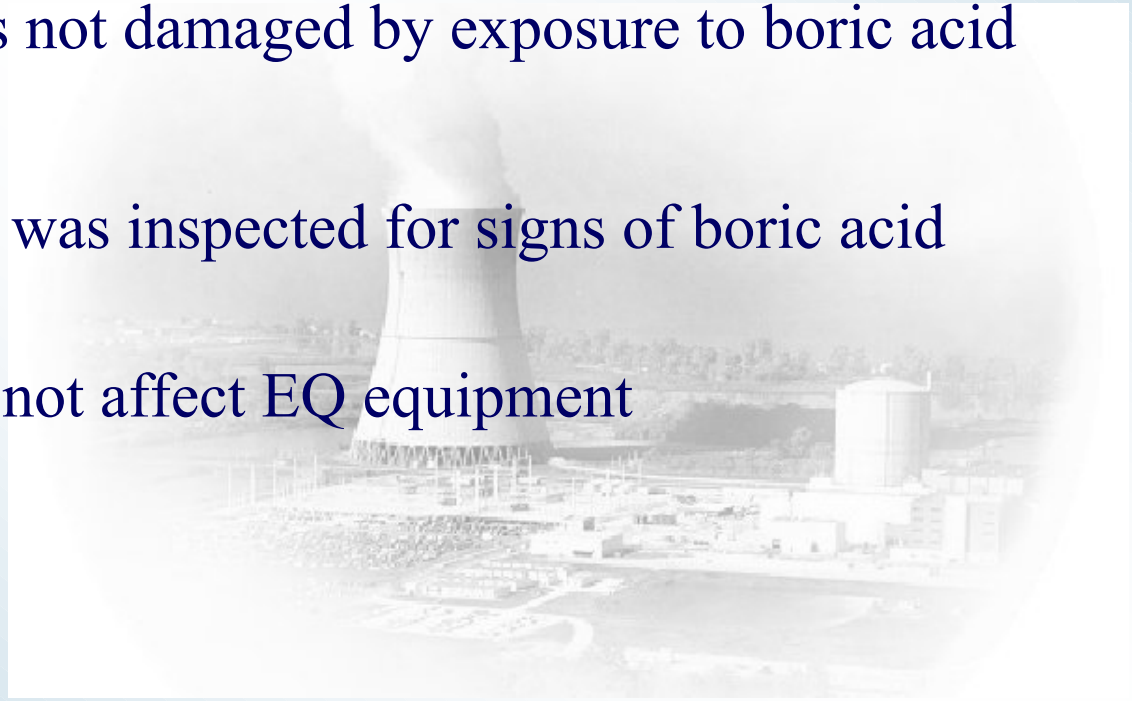
- **Purpose:**
  - Ensure fuel integrity during the next fuel cycle
- **Status:**
  - Defective fuel rods from last cycle removed from service
  - Fuel handling equipment and operating procedures enhanced
  - Detailed visual checks during fuel movement and core load
  - Two instances of spacer grid damage found and corrected
  - Core reload successfully completed



Containment Health

Environmentally Qualified Equipment

- **Purpose:**
  - To ensure that environmentally qualified (EQ) equipment was not damaged by exposure to boric acid
- **Status:**
  - EQ equipment was inspected for signs of boric acid intrusion
  - Boric acid did not affect EQ equipment



Containment Health

Refuel Canal Leakage

- **Purpose:**
  - Evaluate the effect of past leakage on structures
  - Identify possible leakage sources
- **Status:**
  - Concrete samples and non-destructive testing show concrete strength is good
  - Rebar samples show only minor corrosion, not affecting structural integrity
  - Visual, Acoustic, and Vacuum Box testing of canal liner have revealed three potential leak flowpaths
  - Corrective action post restart

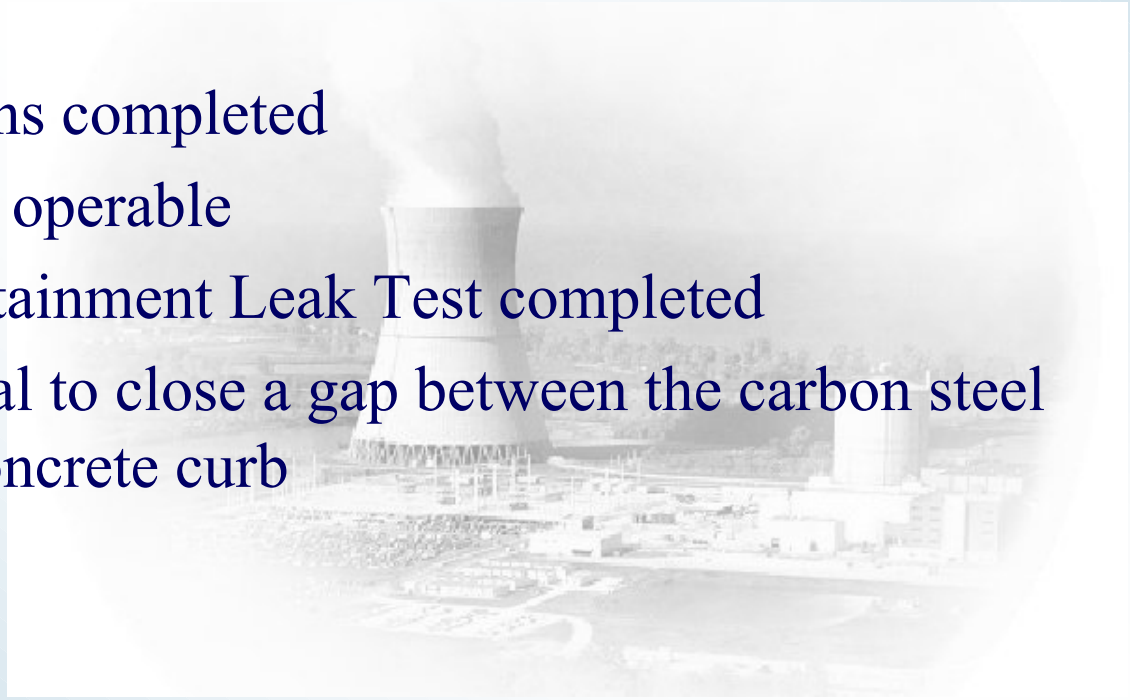
Containment Health

Concrete Core Bore

Containment Health

Containment Vessel

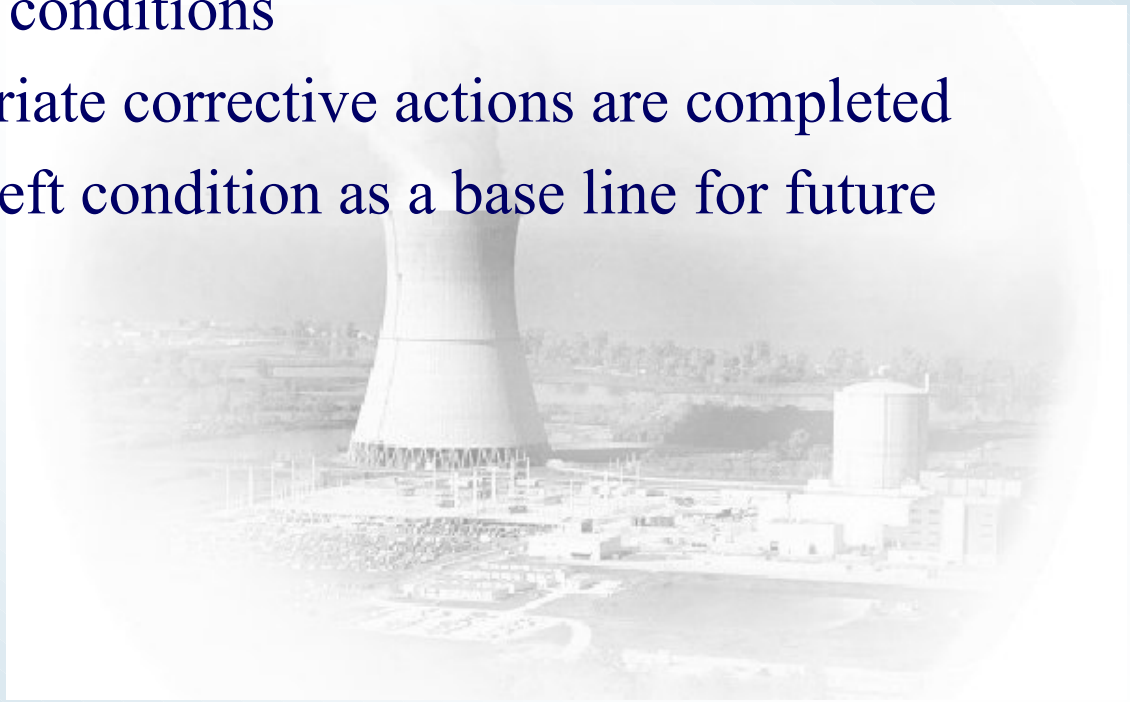
- **Purpose:**
  - To evaluate the integrity of the Containment liner
- **Status:**
  - All examinations completed
  - Containment is operable
  - Integrated Containment Leak Test completed
  - Install grout seal to close a gap between the carbon steel liner and the concrete curb



Containment Health

Containment Inspections

- **Purpose:**
  - Identify all components affected by boric acid
  - Evaluate these conditions
  - Ensure appropriate corrective actions are completed
  - Document as-left condition as a base line for future inspections



Containment Health

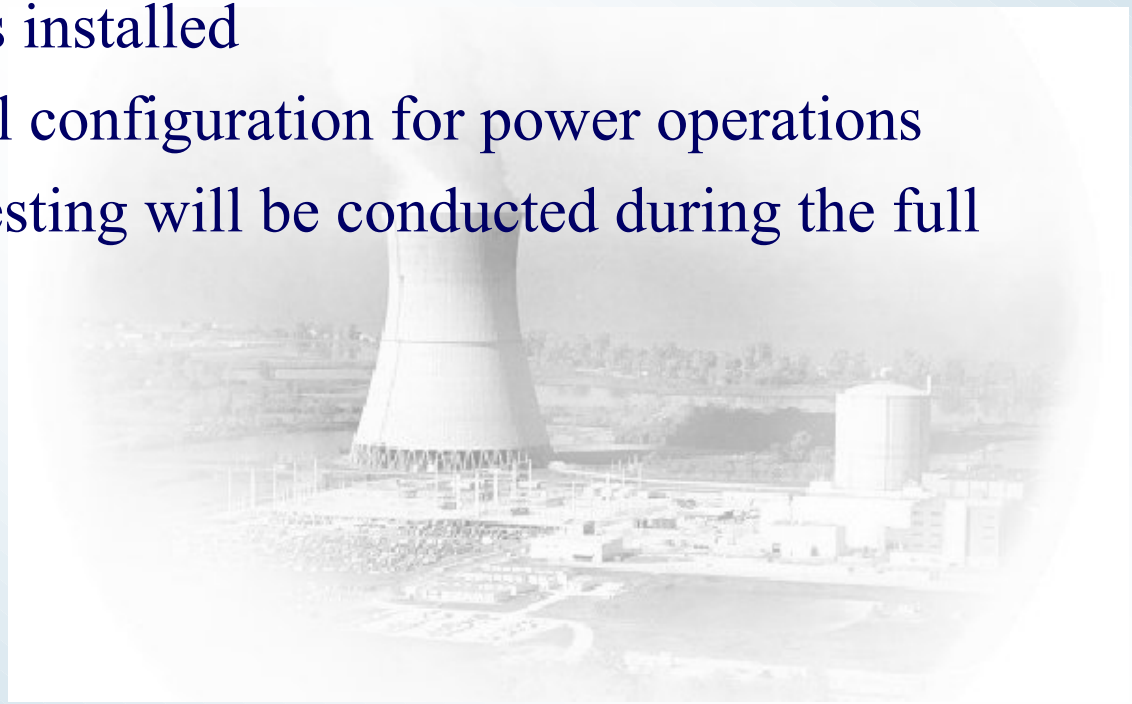
Containment Inspections (Continued)

- **Status:**
  - Discovery inspections completed
  - All evaluations have been prepared
  - Over 6,500 corrective actions have been identified. Not all of these are restart issues.
  - Of 2,219 Restart CAs assigned to Containment Health, 1,426 are completed
  - Remaining restart work is primarily cleaning boric acid residue and reinspecting to verify cleanliness and document as-left conditions
  - Steam cleaning of "D-Ring" areas inside Containment is in progress

Containment Health

Other Site Activities

- **Reactor Pressure Vessel Head:**
  - Reactor reassembled
  - Missile shields installed
  - Plant is in final configuration for power operations
  - Control Rod testing will be conducted during the full pressure test



Containment Health

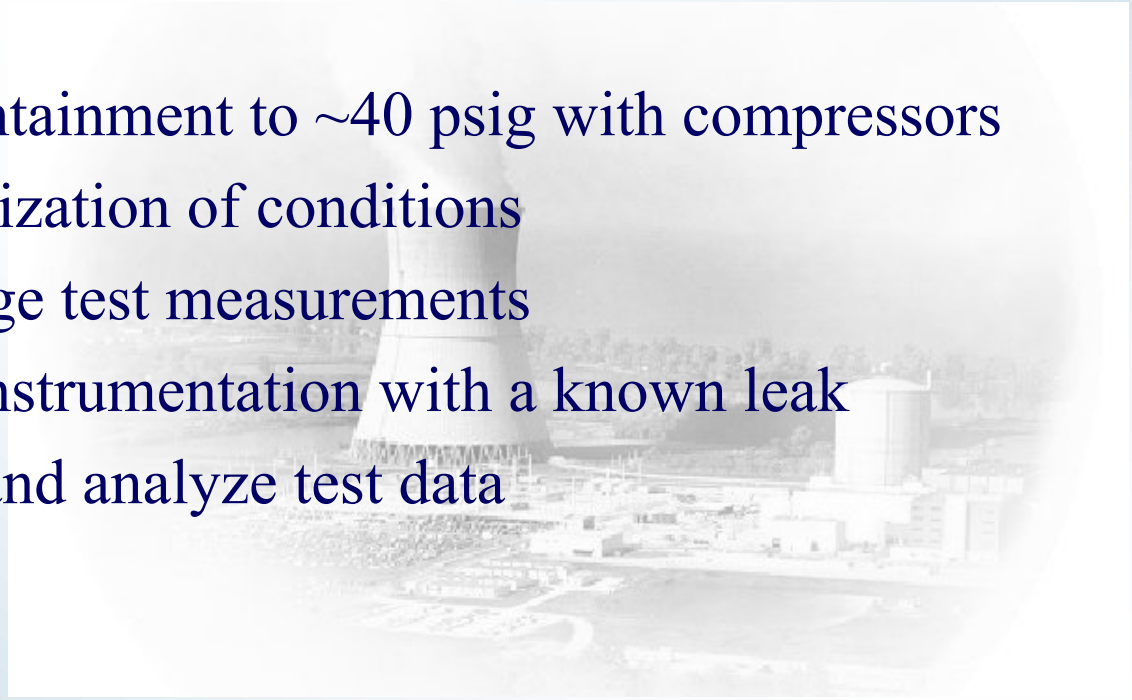
- **FLUS Containment Leakage Detection System:**
  - Installation is complete
  - Will connect to plant computer for remote monitoring
  - Sensitivity testing during the full pressure test

Integrated Leak Rate Test
and
Resolution of Significant Plant Issues

Jim Powers
Director - Nuclear Engineering

Integrated Leak Rate Test

- **Purpose of Test**
  - Demonstrate leak-tight integrity of Containment at a pressure greater than could occur during an accident
- **Approach**
  - Pressurize Containment to ~40 psig with compressors
  - Hold for stabilization of conditions
  - Perform leakage test measurements
  - Validate test instrumentation with a known leak
  - Depressurize and analyze test data



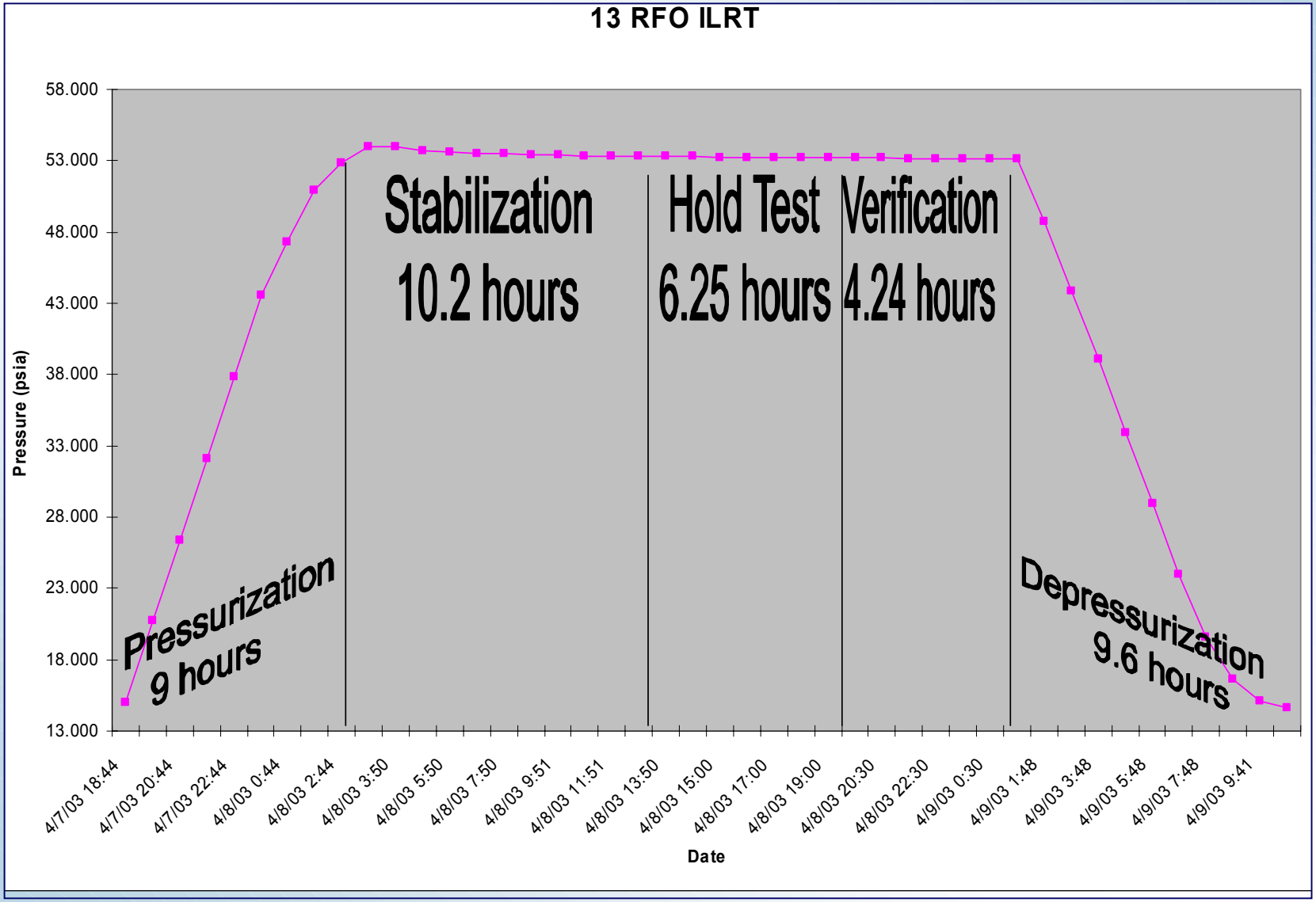
Integrated Leak Rate Test

Integrated Leak Rate Test Compressors

Integrated Leak Rate Test

Integrated Leak Rate Test Manifold

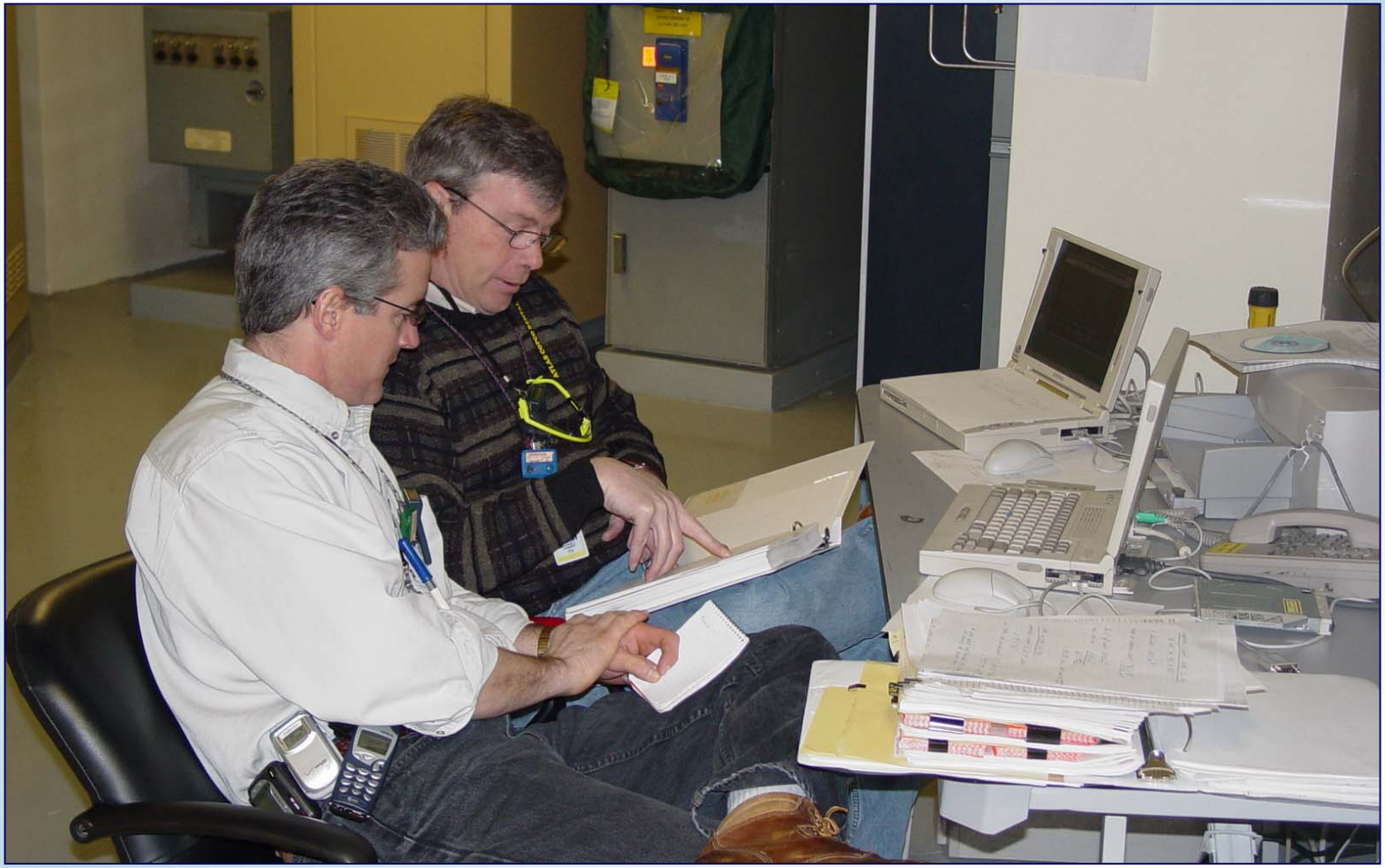
Integrated Leak Rate Test



Integrated Leak Rate Test

- **Safety Culture and ILRT Activities**
  - Demonstrated positive Safety Culture
- **Attributes**
  - Preplanning
  - Cross functional teamwork
  - Contingency planning
  - Previous lessons learned from D-B and industry
  - Industry peer reviewer
  - Resource allocation
  - Solid project management

Integrated Leak Rate Test



Results: Containment Continues to be Leak Tight

Resolution of Significant Plant Issues

- **Significant Plant Issues Being Resolved**
  - Containment Emergency Sump
  - Decay Heat Valve Tank
  - Containment Coatings
  - Valve Team Progress; 1,500 work items
    - 594 valves completed
    - 72 remain
  - Permanent Reactor Cavity Seal
  - Refueling Canal Repair
  - Containment Air Cooler Rebuilds
  - Containment Air Cooler Plenum Replacement
  - FLUS Leakage Monitoring System

Resolution of Significant Plant Issues

- **Significant Plant Issues Being Resolved (Continued)**
  - Reactor Vessel Internal Cleaning
  - Nuclear Fuel Inspections
  - Reactor Coolant System Resistance Temperature Detection Repairs
  - Reactor Coolant Pump 1-1 and 1-2 Refurbishment
  - Electrical System Design Basis Restoration
  - Emergency Diesel Generator Material Condition Improvements
  - Service Water System Cleaning
  - Feedwater Heater 1-6 Retubing
  - Polar Crane and Fuel Handling Crane Control Upgrades
  - Thorough Containment Cleaning