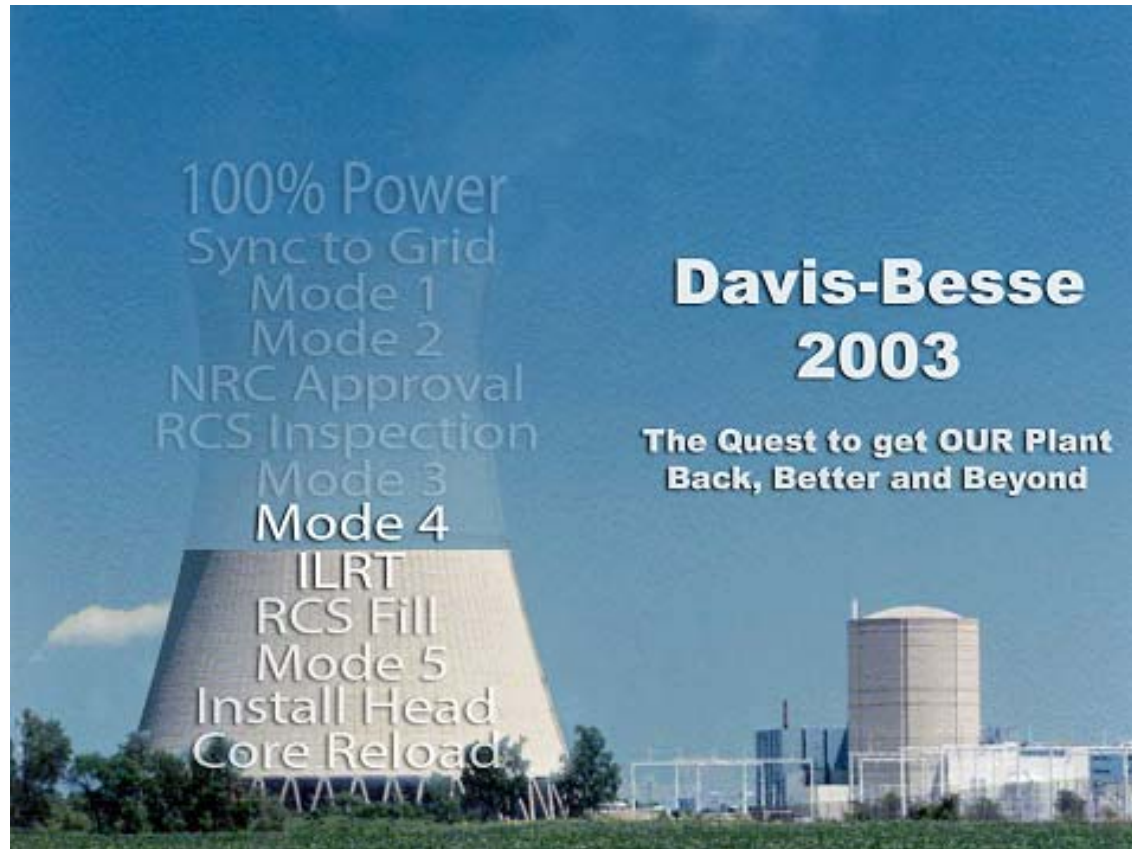


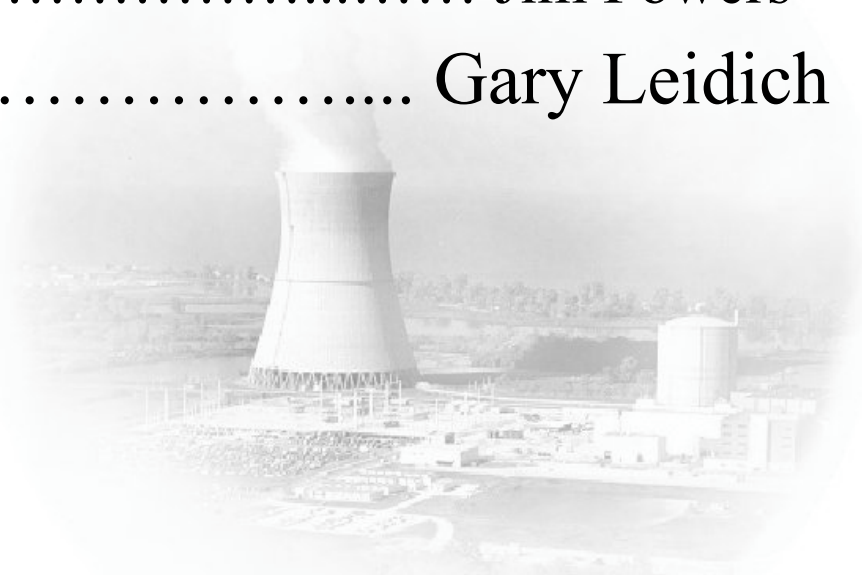
Davis-Besse Nuclear Power Station



Resolution of Design Issues

Agenda

Opening Remarks	Gary Leidich
•Design Reviews.....	Bob Schrauder
•Remaining Design Issues.....	Jim Powers
Closing Comments.....	Gary Leidich



Opening Remarks



Gary Leidich
Executive Vice President - FENOC

3

Overview

- Background

- Developed Building Block approach summer 2002
- System Health Assurance, Program Compliance and Containment Health all produced questions relevant to the design of the plant
- December decision to perform additional reviews, including Safety Function Validation Project (SFVP)
- Extensive effort included calculation reviews, detailed design reviews, revalidation of design inputs, and SFVP

- Today

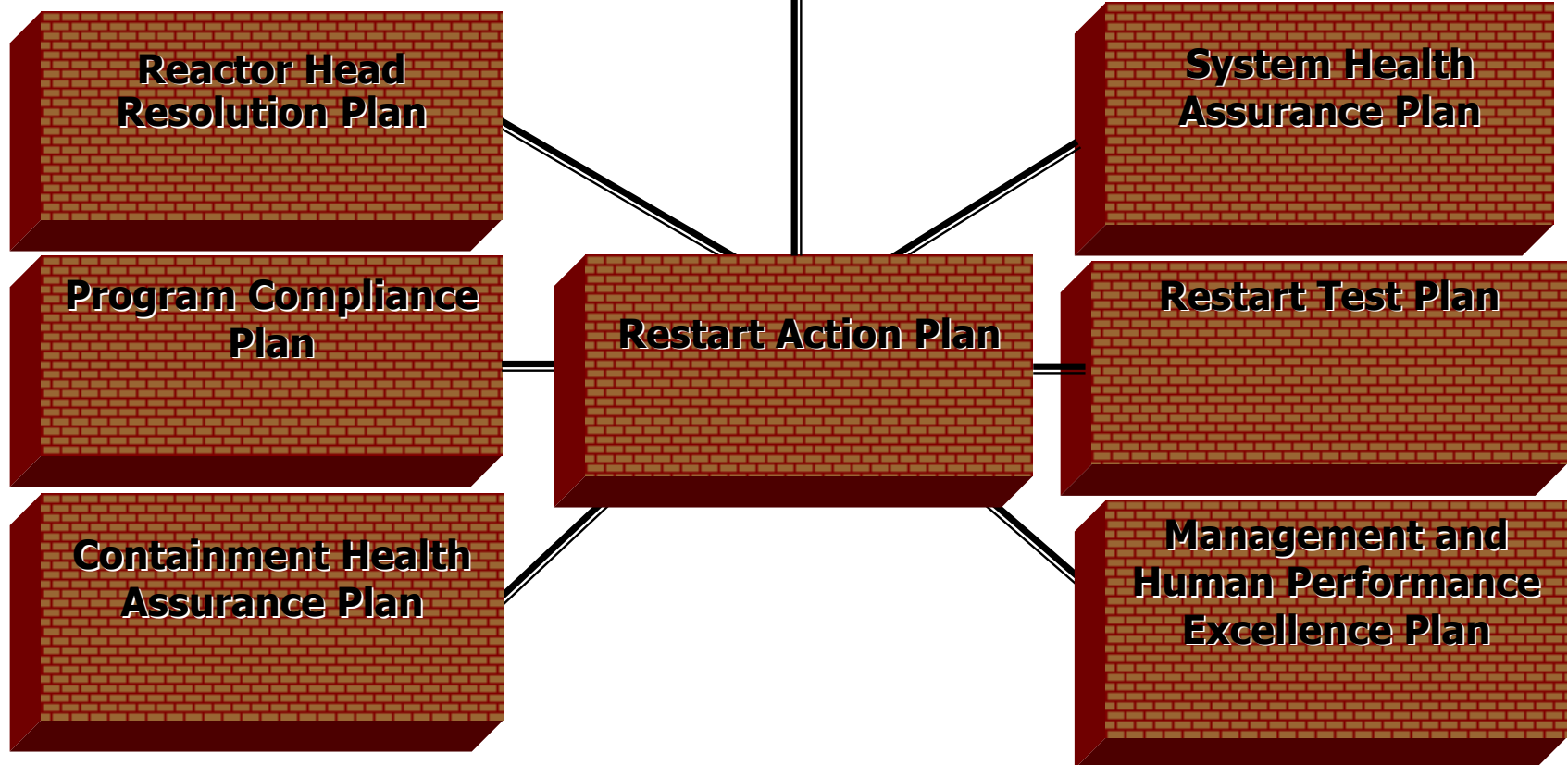
- Present overall results and conclusions
- Discuss few remaining issues and resolution plans

Desired Outcome

- Demonstrate to the regulators and the public that FirstEnergy has provided reasonable assurance that systems at Davis-Besse can perform their safety and accident mitigation functions

Return to Service Plan

Restart Overview Panel



Design Reviews



Bob Schrauder
Director - Support Services

Design Reviews

- Purpose

- Provide assurance that the safety function of those systems which have a significant contribution to Core Damage Frequency and Large Early Release Frequency ($>99\%$) would perform their safety and accident mitigation functions

- Reviews performed

- Latent Issue Reviews (5 systems)
- Safety Function Validation Project (10 systems)

Design Reviews Performed

- Latent Issue Reviews
 - Reactor Coolant System
 - Auxiliary Feedwater System
 - Component Cooling Water (CCW) System
 - Emergency Diesel Generators
 - Service Water System

Design Reviews Performed

- Safety Function Validation
 - Main Steam System
 - Steam Generators
 - Safety Features Actuation System
 - Steam and Feedwater Rupture Control System
 - High Pressure Injection System
 - Decay Heat Removal/Low Pressure Injection (LPI) System
 - Heating, Ventilation and Air Conditioning (HVAC) of Emergency Core Cooling System
 - 4160 Volt AC
 - 480 Volt AC
 - 125/250 Volt DC

Current Status

- Safety functions confirmed
 - Main Steam System
 - Service Water System
 - Safety Features Actuation System
 - Steam Generators
 - Reactor Coolant System



Steam and Feedwater Rupture Control System

- Technical Specification trip setpoint value for reverse differential pressure is non-conservative relative to the Design Basis Calculation
- Actual field setpoint was conservative relative to the Design Basis Calculation, but did not account for instrument uncertainty
 - In accordance with NRC Administrative Letter 98-10, “Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety,” administrative controls will be in place to assure compliance with Design Basis pending revision to the Technical Specification
- Isolated occurrence bounded by Safety Function Validation Project

Auxiliary Feedwater System

- Pumps and piping may be subjected to a lower temperature than analyzed (8° F difference)
 - Reanalysis to be performed post restart
 - Acceptability highly likely
- Instrument uncertainty for pump flow acceptance criteria not formally documented
 - Calculation verifying no impact is in final review

Component Cooling Water System

- Flow test verifying adequate flow to minor flow paths has not been performed
 - System flow test scheduled prior to Mode 4
 - Demonstration of adequate flow is expected
- Air Operated Valve deficiencies may impact system operability

Decay Heat Removal /Low Pressure Injection System

- NPSH and potential vortexing issues related to boron precipitation control
 - Additional testing and analysis nearing completion
 - Function capability expected to be demonstrated
 - Modification to add additional method of boron precipitation to be implemented prior to restart
- Impact of sump debris on pump seal being evaluated
- Flow test demonstrating system margin scheduled prior to restart
- Air Operated Valve deficiencies may impact system operability

Emergency Diesel Generators

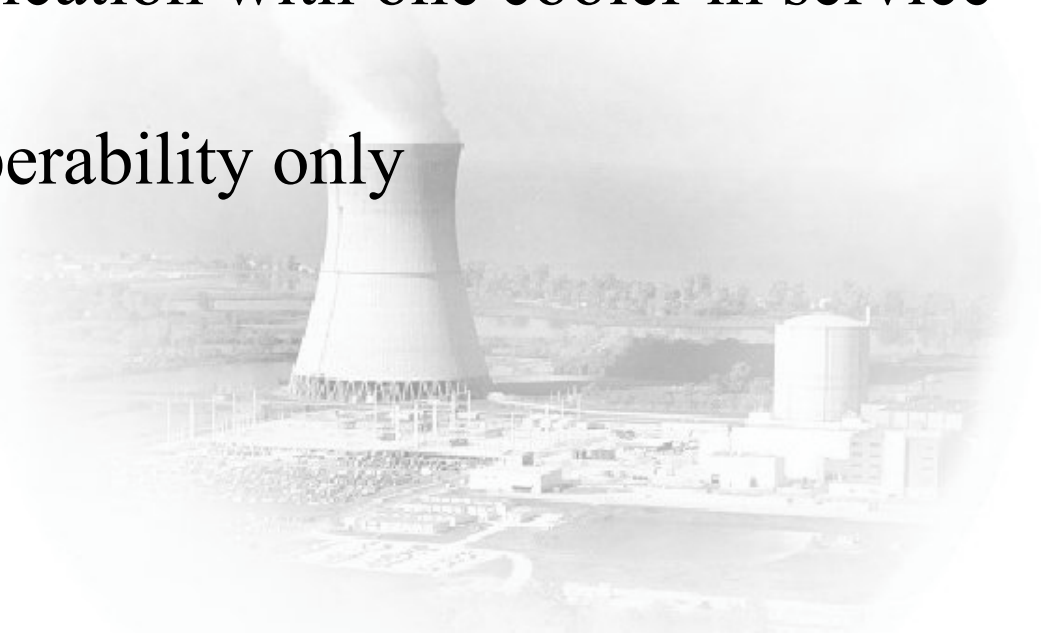
- Voltage and frequency drop during first load step
 - Transient analysis demonstrating acceptability in review
- Room temperature may exceed maximum analyzed value
 - New analysis demonstrating past operability in review
 - Additional ventilation to be installed

High Pressure Injection System

- Sump debris could potentially result in pump damage during recirculation phase
- Motor exceeds its nameplate rating during accident conditions
 - Preliminary evaluations indicate the motor will remain within its service factor range and will be acceptable
- Inconsistencies between Surveillance Test criteria and Technical Specification requirements
 - Acceptance criteria clearly satisfies accident analysis
 - Acceptable flow demonstrated; instrument uncertainties are being incorporated and are expected to be acceptable

ECCS-HVAC

- Historical operability justification with one cooler in service flawed
- Potential impact on past operability only



Electrical Distribution Systems

4160 Volt AC; 480 Volt AC; 125/250 Volt DC

- Reanalysis is incomplete



Topical Area Reviews

- Purpose

- Evaluate cross-cutting generic issues that could affect multiple systems

- Scope

- Seismic Qualification
- Station Flooding
- High Energy Line Breaks (HELB)
- Environmental Qualification (EQ)
- Appendix R - Safe Shutdown Analysis



Topical Area Reviews

Appendix R - Safe Shutdown Analysis

- Actions to Support Restart

- Complete Framatome analysis to rebaseline Appendix R transient analysis
- Complete necessary procedural revisions resulting from new analysis
- Complete analysis for Emergency Diesel Generator, Component Cooling Water System, and Service Water System for Appendix R scenarios
- Evaluate technical adequacy of calculations performed in response to Requests for Assistance
- Complete procedure upgrade project for Safe Shutdown procedures
- Train operators on new procedures

- Future Improvements

- Revise Fire Hazards Analysis Report, as necessary

Topical Area Reviews

Summary of Results

- Collective Significance reviews confirmed that the programs were adequate to support safe plant operation
- Each review identified discrepancies which needed to be resolved
- Extent of Condition reviews were performed where warranted
- Issues appropriately dispositioned as restart or post-restart

Summary of Results of Design Reviews

- Safety functions confirmed for a number of systems
- Ongoing activities expected to confirm operability of other systems
- Some systems were inoperable
 - Corrective actions are being taken
 - Conditions are isolated or bounded

Remaining Design Issues



Jim Powers

Director - Davis-Besse Engineering

Remaining Design Issues

Restart Readiness

- Provide assurance that
 - Safety issues are resolved
 - Technical Specification operability is met
 - Systems, structures, and components will perform their safety functions
- Significant design issues requiring completion of corrective actions for restart
 - High Pressure Injection Pumps Recirculation Mode
 - Electrical Distribution System
 - Air Operated Valves
 - Emergency Diesel Generator Loading

Remaining Design Issues

High Pressure Injection Pumps Recirculation Mode



High Pressure Injection Pump

- Issue
 - Fine debris from containment emergency sump could potentially result in damage to pumps during the loss-of-coolant accident recirculation mode
- Resolution Options
 - Modify and test existing pumps to ensure operability
 - Install new pumps and motors
- Extent of Condition
 - Low Pressure Injection Pumps
 - Cyclone Separator
 - Containment Spray Pumps

Remaining Design Issues

Electrical Distribution System



Electrical Breaker Cabinet

- Issue
 - Condition reports questioned the analysis of the electrical distribution system
- Resolution
 - Revalidate input to the analysis
 - Reanalyze calculations using updated computer software to meet industry standard
 - Validate results to ensure electrical distribution system meets its safety functions
- Extent of Condition
 - 4160V AC, 480V AC, and 125/250V DC systems

FirstEnergy Remaining Design Issues

Air Operated Valves



Air Operated Valve

- Issue
 - Air Operated Valves (AOVs) have design basis issues related to calculations and hardware
- Resolution
 - 19 valves potentially had negative margin
 - Adjust 7 valves (prior to restart)
 - Modify 12 valves (prior to restart)
 - 10 valves to have margin increased (post-restart)
 - 54 valves demonstrated sufficient margin
- Extent of Condition
 - Safety significant AOVs included in program
 - Motor Operated Valves addressed by GL 89-10 Program

Remaining Design Issues

Emergency Diesel Generator (EDG) Loading



Emergency Diesel Generator

- **Issue**

- EDG loading analysis not updated
- EDG starting voltage and frequency response not in accordance with design and licensing basis

- **Resolution**

- Revise EDG loading calculation
- Prepare transient analysis for EDG voltage and frequency response and evaluate impact on safety functions
- Evaluate results to ensure the EDGs will meet design basis load requirements

- **Extent of Condition**

- Adequacy of design calculations being addressed

Remaining Design Issues

Conclusion

- Resolution of the remaining design issues is being addressed in the Corrective Action Program and will ensure safe and reliable operation

50.54(f) Design Basis Information Letter Responses Background

- Response credited calculation improvement programs and system design description projects of mid-1980's
- Excluded Topical Areas due to previous assessments and inspections
 - Environmental Qualification
 - High Energy Line Breaks
 - Seismic Analysis
 - Flooding
- Initiated a Design Basis Validation Program

50.54(f) Design Basis Information Letter Responses Background

- Design Basis Validation (DBV) Program reviews were performed
- Program's completion was defined as capturing open items for disposition in:
 - Corrective Action Program
 - Corrective Action Tracking System
 - DBV Program Tracking Database



50.54(f) Design Basis Information Letter Responses Issues

- Completion of open items (e.g., calculations) had less than adequate priority
- Collectively the System Health Readiness Reviews (SHRR), Latent Issue Reviews (LIR), and Safety Function Validation Project (SFVP) provided a different and more incisive assessment of the design basis
 - Found similar weaknesses in design basis calculations
 - Design basis was largely found to be adequate to support operability

50.54(f) Design Basis Information Letter Responses Summary

- DBV Program was completed to the extent defined in the responses (i.e., placed into a tracking system)
- Follow-up items have been dispositioned or placed in the Corrective Action Program
- DBV Program provided significant value relative to the documented review of the design bases
- SHRR, LIR, and SFVP have substantiated the design basis was adequate to support operability
- Capture the results of current reviews and submit 50.54(f) Design Basis Information supplemental letter to NRC

Closing Comments



Gary Leidich
Executive Vice President - FENOC

Conclusion

- Based on the extensive Latent Issues Reviews, focused self-assessments, Safety Function Validation, Topical Area Reviews, containment inspections, and program reviews, there is reasonable assurance Davis-Besse's systems will be able to perform their intended safety functions upon completion of the remaining defined activities