Davis-Besse Nuclear Power Station



IMC 0350 Meeting

Davis-Besse Nuclear Power Station

April 15, 2003



Meeting Agenda

 Operations Restart Readiness Assessments – Operations Mode 4 Preparation, Actions for Restart – Operations Leadership, Operability Evaluation 	Randy Fast 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 Restart Action Performance	.Mike Stevens Clark Price



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Randy Fast Plant Manager

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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

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- 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





• 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

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Operations Leadership and Operability Evaluation



Bill Pearce Vice President - FENOC Oversight

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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

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Design Issue Resolution



Bob Schrauder Director - Support Services

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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





Randy Fast Plant Manager

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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

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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 ft² to approximately 1200 ft²
 - Field Installation complete
 - NRC inspection of the modification performed



Access Hatch and Upper Strainer



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Lower Emergency Sump Strainer

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Debris Screen Gate



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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





Core Flood Tank

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Service Water Piping and New Tags

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Containment Dome

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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 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 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 Air Cooler #3

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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

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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



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 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 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 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

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



•FLUS Containment Leakage Detection System:

- Installation is complete
- Will connect to plant computer for remote monitoring
- Sensitivity testing during the full pressure test



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Integrated Leak Rate Test and Resolution of Significant Plant Issues



Jim Powers Director - Nuclear Engineering

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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 Compressors

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Integrated Leak Rate Test Manifold

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- 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





Results: Containment Continues to be Leak Tight

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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

Mode 5 Safety Culture Assessment and Independent Safety Culture Survey



Lew Myers Chief Operating Officer - FENOC

Davis-Besse Nuclear Power Station

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Desired Outcome

Demonstrate recent actions:

- Status safety culture review for Mode 5
- Independent review correlation
- Review safety conscious work environment survey results

Methodology

- Business practice critique
- Two day meeting with all managers
- Criteria for groups/graded as groups
- Management team consensus
- Refined the criteria to be more objective



teria Example of Safety Culture C

INDIVIDUALS' COMMITMENT AREA					
CRITERIA RELATED TO QUESTONING ATTITUDE Challenges are welcomed					
ATTRIBUTE	RED	YELLOW	WHITE	GREEN	
Quality of pre-job briefs	Management observations and QA field observations show that most pre-job briefs are not acceptable.	Management observations and QA field observations show that most pre-job briefs are acceptable.	Management observations and QA field observations show that, with some exceptions, pre-job briefs are acceptable.	Management observations and QA field observations show that pre-job briefs in general are acceptable.	
Percent of CRs per person per group	Less than 13% of individuals wrote CRs during the past 30 days.	Between 13-15% of individuals wrote CRs during the past 30 days.	Between 15-17% of individuals wrote CRs during the past 30 days.	More than 17% of individuals wrote CRs during the past month.	
Number of programmatic CRs	The number of programmatic CRs indicates that individuals in general are reluctant to write CRs on programmatic and management issues.	The number of programmatic CRs indicates that most individuals are willing to write CRs on programmatic and management issues.	The number of programmatic CRs indicates that a large majority of individuals are willing to write CRs on programmatic and management issues.	The number of programmatic CRs indicates that individuals in general are willing to write CRs on programmatic and management issues.	
Program and process error rate	>0.48 program and process errors per 10,000 hours worked.	<0.48 program and process errors per 10,000 hours worked.	<0.30 program and process errors per 10,000 hours worked.	<0.27 program and process errors per 10,000 hours worked.	
Raising problems	Management observations and NQA field observations show that most individuals are not raising problems encountered in the field.	Management observations and NQA field observations show that most individuals are raising problems encountered in the field.	Management observations and NQA field observations show that a large majority of individuals are raising problems encountered in the field.	Management observations and NQA field observations show that individuals in general are raising problems encountered in the field.	

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Policy or Corporate Commitment Area

- Policies on Safety Culture and Safety Conscious Work Environment clearly state that safety is a core value and are understood by the organization
- Management values are clearly reflected in the Business Plan and are understood by the organization
- Resources are available or can be obtained to ensure safe, reliable operations
- Self-assessment is a tool used to monitor, assess and improve our performance
- Independent Oversight is a tool used to validate White acceptable performance and identify areas for improvement or corrective action



Yellow

Yellow

White

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Policy or Corporate Commitment Area

Basis for Overall Rating of Yellow

- The 2003 FENOC Business Plan is not approved and distributed to employees
- Employees are unaware of the Nuclear Performance Index Incentive for 2003
- Maintenance, Radiation Protection/Chemistry, and Design Engineering are yellow based on resources availability
- Lack of appropriate section performance indicators



- Plant Management Commitment Area
 - There is visible commitment to safety: nuclear, industrial, radiological, and environmental
 - Goals and roles are clear and teamwork is reinforced
 - Ownership and accountability is evident
 - Training and qualification is valued
 - Commitment to continuous improvement is evident
 - Cross-functional work management and communication
 - Creating and environment of engagement and commitment

Yellow (improving) White White

Yellow White Yellow

Yellow

White

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Plant Management Commitment Area

- Basis for Overall Rating of Yellow
 Improving
 - Until recently the site accepted the continual delay of corrective actions
 - Identified lack of trust in several departments due to changes in organization and work hours
 - Almost all employee development plans are overdue
 - Contractor training qualifications are a concern



Individual Commitment Area

- Drive for excellence-nuclear assets of people and plant are continuously improved to enhance margins of safety
- Questioning attitude challenges are welcomed
- Rigorous work control and prudent approach performing activities in a quality manner is the standard
- Open communications associates are comfortable in voicing opinions, issues and concerns
- Nuclear Professionalism persistence and urgency in identification and resolution of problems is prevalent

Yellow Yellow

Green Yellow

White

Yellow

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Individual Commitment Area

- Basis for Overall Rating of Yellow
 - Overall quality of pre-job briefs is white; green for critical evolutions, yellow for lower significance work
 - We are putting resources on Procedure Change Request backlog
 - Rotating equipment is a major rework challenge for Maintenance
 - 72 Preventive Maintenance tasks are past their due date and awaiting deferral
 - Personal initiative and ownership are yellow

Correlation of Independent Safety Culture Assessment





Bill Pearce Vice President - FENOC Oversight

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- Employee Survey:
 - Conducted March 26 28, 2003
 - FENOC employees and contract employees
 - 1,138 responses from target population of ~1,448 (~79%)
 - 36 questions
 - 26 same as August 2002 survey
 - Survey structured to assess four pillars





Pillar 1: Willingness to Raise Concerns



Pillar 1: Willingness to Raise Concerns



Pillar 1: Willingness to Raise Concerns



Pillar 1: Willingness to Raise Concerns



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Pillar 1: Willingness to Raise Concerns



Pillar 1: Willingness to Raise Concerns



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Pillar 2: Normal Problem Resolution Processes



I know how to write a Condition Report and get it into the system or know who to contact to get help in initiating a Condition Report. 19 If I identified a potential nuclear safety or nuclear quality issue I would ensure that a Condition Report was written to address the issue. 20 66

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Pillar 2: Normal Problem Resolution Processes



Pillar 2: Normal Problem Resolution Processes



I feel free to raise nuclear safety/nuclear quality concerns through the Condition Report process without fear of reprisal. 25

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Pillar 3: Employee Concerns Program



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Pillar 3: Employee Concerns Program



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Pillar 3: Employee Concerns Program



Pillar 4: Detect and Prevent Retaliation



I am aware of the FENOC Safety Conscious Work Environment Policy. 32 I am aware of the Safety Conscious Work Environment Review Team and its purpose. 34


Pillar 4: Detect and Prevent Retaliation



Pillar 4: Detect and Prevent Retaliation



Within the last six months, I have been subjected to HIRD for raising nuclear safety, quality or compliance concerns while working at Davis-Besse. 35 I am aware of instances that occurred within the last six months in which workers in my work group have been subjected to HIRD for raising nuclear safety, quality or compliance concerns while working at Davis-Besse. 36

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Yes

15%

March

Pillar 4: Detect and Prevent Retaliation



Within the last six months, I have been subjected to HIRD for raising nuclear safety, quality or compliance concerns while working at Davis-Besse. 35 I am aware of instances that occurred within the last six months in which workers in my work group have been subjected to HIRD for raising nuclear safety, quality or compliance concerns while working at Davis-Besse. 36



- Results Show Improvement from August 2002
 Survey
 - Significant improvement on 24 of 26 questions
- Additional Work Required
 - Demonstrating management commitment to Safety Conscious Work Environment
 - Improving Confidence in Corrective Action Program
 - Improving Confidence in Employee Concerns Program



Milestone Progress/Bulk Work



Mike Stevens Director - Maintenance

Davis-Besse Nuclear Power Station

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Restart Progress

Major Milestones

- Making progress
- Preparing for Mode 4 and Mode 3 pressure test

Integrated Schedule

- Includes all Building Block activities
- Potential schedule impact
 - High Pressure Injection Pump
 - Bulk Work

Performance Indicators

- Schedule vs. forecasts
- Bulk work
- Emergent workscope

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Integrated Schedule

Making Progress

- Completed Reactor Coolant System Valve Maintenance
- Restored Containment Air Cooler #2 and #3
- Completed Reactor Coolant Pump Maintenance
- Completed Emergency Sump installation
- Decay Heat Valve Tank Modification near completion
- Filled Reactor Coolant System
- Completed FLUS Installation
- Completed Containment Pressure Test (ILRT)
- Next Milestone
 - Mode 4 and Mode 3 Pressure Test



DAVIS-BESSE NUCLEAR POWER STATION TOTAL RESTART Activites



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Summary

- Making Progress
- Moving Toward Restart
 - High Pressure Injection (HPI) Pump
 - Electrical distribution
 - Readiness meetings
 - Mode 4 pressure test mid to late May
 - Startup approximately one month later
 - Working options to resolve HPI Pump within this timeframe





Clark Price Owner - Restart Action Plan

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Measuring Our Progress

- Nuclear Regulatory Commission 0350 Checklist
- Overall Restart Actions



ltem No.	0350 Item Description	Discovery	Implementation					
1	Adequacy of Root Cause							
а	Penetration cracking and Reactor Pressure Vessel corrosion	Technical Root Cause 02-0891						
b	Organizational, Programmatic and Human Performance Issues	90						
2	Adequacy of Safety Significant Structures, Systems and Components							
а	Reactor Pressure Vessel Head Replacement		97					
b	Containment Vessel Restoration following RPV Head Replacement		99					
С	Structures, Systems and Components Inside Containment	100	86					
c.1	Containment Emergency Sump	100	98					
d	EOC of Boric Acid in Systems Outside of Containment	100	83					

Field Complete	In Progress	Hold -	Plant (Conditions	;	N/A -	Not Appli	cable

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ltem No.	0350 Item Description	Discovery	Implementation						
3	Adequacy of Safety Significant Programs								
a	Corrective Action Program	100	100						
b	Operating Experience Program	100	100						
c.1	Quality Audits	100	95						
c.2	Self-Assessments of Programs		100						
d	Boric Acid Corrosion Management Program	100	100						
e	Reactor Coolant System Unidentified Leakage Monitoring Program		75						
f	In-Service Inspection Program	100	100						
g	Modification Program	100	100						
h	Radiation Protection Program	100	85						
I	Completeness & Accuracy of Required Records & Submittals to NRC		60						

							1			
	Field Complete	In Progress	Hol	ld - Plant C	onditions	N/A	- Not	Applic	able	

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ltem No.	0350 Item Description	,	Di	scov	ery	,,	Implementation					
4 a-b	Adequacy of Organizational Effectiveness & Human Performance			1						8	5	
5	Readiness for Restart											
а	Review of Licensee's Restart Action Plan			1	1			ł		F		
b	Systems Readiness for Restart			1	5	100		-		79		
b.1	Design Calculation Resolution			1	:	100	 Inc	luded i	n 5b			
c	Operations Readiness for Restart			1	F	<u>}</u>	Re	start R	eadines	s Revi	ews	
d	Test Program Development and Implementation			1	:	3			6	6		
6 a-f	Licensing Issue Resolution										100	
7 a	Confirmatory Action Letter Resolution						 CAL	Resolut	ion & Ro	estart R	eport	
						{		1				

							{			
Field Complete	In Progress	Hold	- Plant (Conditi	ons	N/A	- Not	Applic	able	

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Closing Comments



Lew Myers Chief Operating Officer - FENOC

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