

FENOC Fleet Overview



NRC Senior Management Briefing
January 14, 2009



Agenda

- **Opening Remarks, Introductions**

Joe Hagan – President and Chief Nuclear Officer

- **Fleet Oversight**

Karen Fili – Vice President, Oversight

- **Fleet Project Update and Assessments**

Dan Pace – Senior Vice President, Fleet Engineering

- **Targeted Performance Improvement**

Jim Lash – Senior Vice President and Chief Operating Officer

- **Site Performance**

Perry – Mark Bezilla, Vice President

Davis-Besse – Barry Allen, Vice President

Beaver Valley – Pete Sena, Vice President

- **Closing Remarks**

Joe Hagan

Desired Outcomes

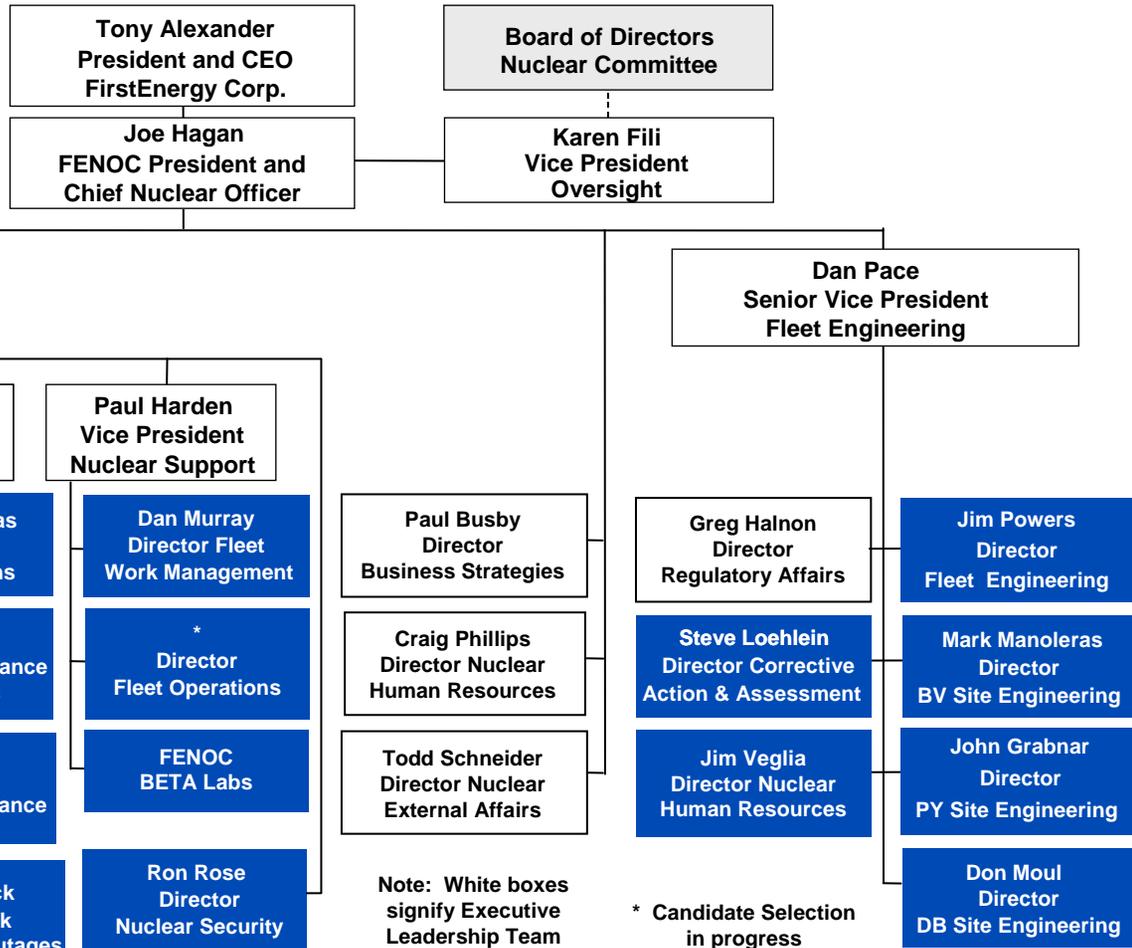
- **Review 2008 safe and reliable fleet performance**
- **Discuss Nuclear Oversight perspective**
- **Outline Fleet Projects and Assessments**
- **Discuss targeted areas to improve performance**
- **Report safe plant operating performance and challenges**



Fleet Overview - Organization



FirstEnergy Nuclear Operating Company



Fleet Results – 2008 in Review

■ Personal safety excellence continued:

Fleet OSHA rate = 0.29

- Davis-Besse at >9.3 million hours without a Lost Time Incident
- Beaver Valley at >2.0 million hours without a Lost Time Incident
- Perry had achieved >6.0 million hours prior to a Lost Time Incident in October 2008

■ Maintained focus on safe and reliable day-to-day operations

- 92.6% Fleet Capability Factor
- 0.83% Fleet Forced Loss Rate

■ Achieved Staffing Goals

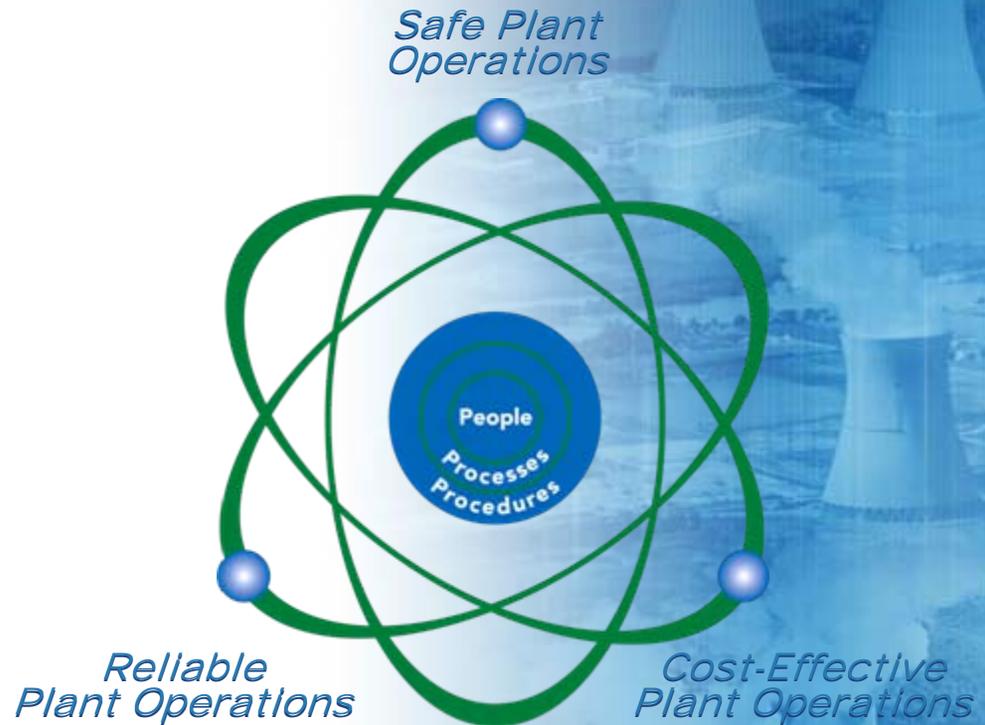
Fleet Results – 2008 in Review

- **Completed Confirmatory Order Independent Assessments at Davis-Besse**
- **Completed transition to Improved Standard Technical Specifications at Davis-Besse**
- **Completed scheduled audits and inspections for Beaver Valley License Renewal**
 - Draft NRC Safety Evaluation Report received
 - No hearing or intervention requests
- **Focused on Perry performance improvement**
 - Equipment / material condition investments showing success
 - Human Performance results merit continued emphasis and attention

Fleet Oversight

Karen Fili

Vice President – Oversight



FENOC Vision

People with a strong safety focus
delivering top fleet operating performance.

Nuclear Fleet Oversight

- **2008 Fleet Oversight**

- Human Performance
- Perry Recovery Plan
- Training

- **Quality Assurance Program Audit**

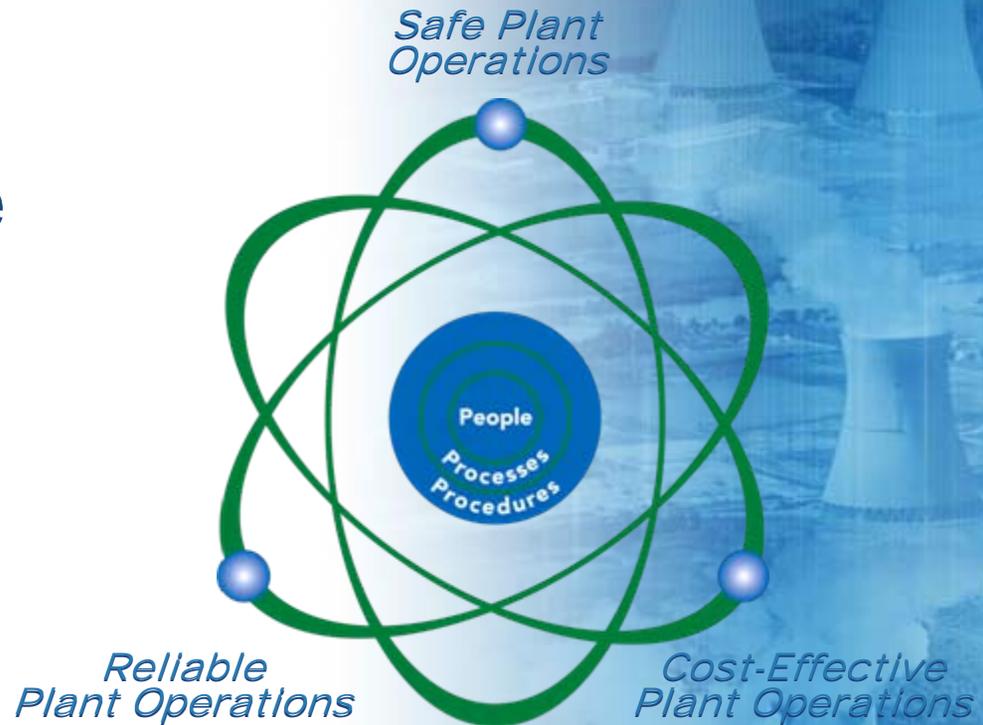
- **Workforce Advisory Committee**

- **Safety Conscious Work Environment**

Fleet Projects Update and Assessments

Dan Pace

*Senior Vice President –
Fleet Engineering*



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Fleet Project Status

■ Improved Standard Technical Specification Conversion Completed

- Perry – Amendment in 1995
- Beaver Valley – Amendment in 2007
- Davis-Besse – Amendment in 2008

■ License Renewal

- Beaver Valley – submitted 2007, under review, on track for 2009
- Davis-Besse – 2010 submittal, site project activities underway
- Perry – 2013 submittal

■ 10 CFR Part 26 – Fatigue Rule

- Common process and procedures
- Developing time-tracking tool
- Full transition to revised requirements by September 30, 2009

Fleet Project Status

■ Spent Fuel Storage

- Beaver Valley 2 – Rerack by 2011, dry storage after approximately 2025
- Perry – Dry storage by 2011
- Beaver Valley 1 – Dry storage by 2014
- Davis-Besse – Return to dry storage by 2022

■ Vessel Head / Steam Generator Replacement

- Beaver Valley 1 – Completed 2006
- Davis-Besse – 2014
- Beaver Valley 2 – 2017 (tentative)

Fleet Project Status

- **Fire Protection – NFPA 805 Transition; following pilot plants**
 - Beaver Valley 1 and 2 – 2010 Submittal
 - Davis-Besse – 2010 Submittal
 - Perry – To be determined

- **Equipment Reliability – Turbine Rotor replacements**
 - Beaver Valley 1: Low Pressure (LP) 2010
 - Beaver Valley 2: LP 2011
 - Davis-Besse: LP complete, High Pressure to be determined
 - Perry: LP 2013

Fleet Assessment

- **Corporate Assessments and Focused Self-Assessments are used to identify improvement opportunities**
 - Integrated performance assessments
 - Twice per year, evaluates organizational trends
 - Station mid-cycle assessments performed
 - Station functional areas evaluated against industry excellence
 - Targeted topical areas
 - Conducted Intake Structure Vulnerability Assessments across fleet
 - Fleet Focused Self-Assessments of FENOC Focus Areas
 - Operations Fundamentals (2nd half 2007)
 - Outage Preparation and Execution (mid-2008)
 - Equipment Reliability (late 2008)
 - Radiation Protection/Dose Control (in review)

Fleet Assessment

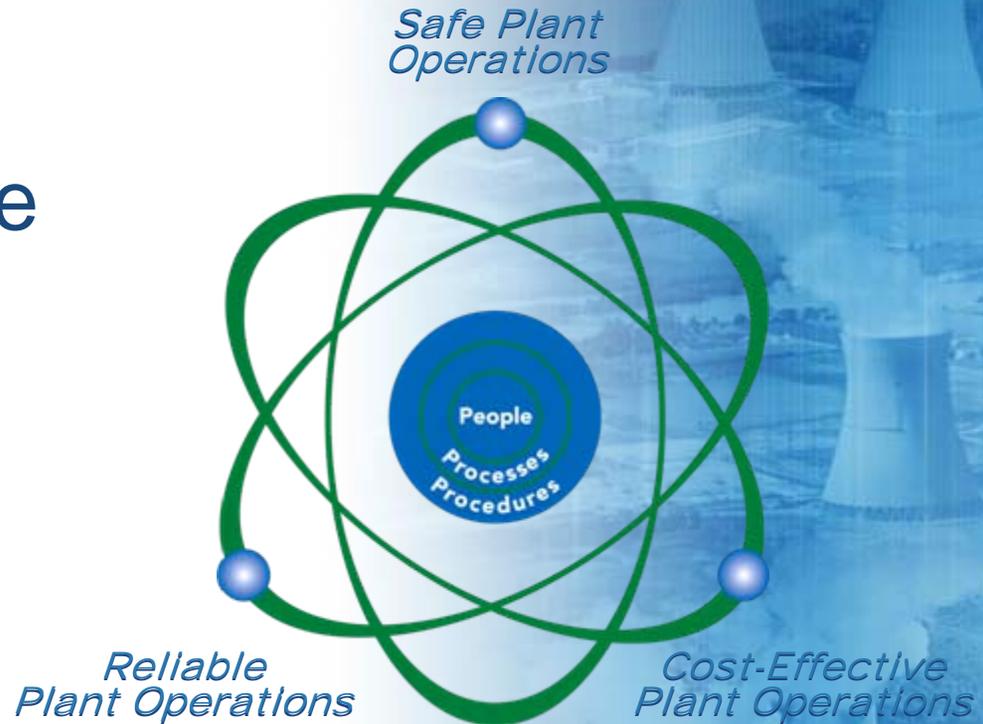
■ Assessment results

- Self-identified improvement opportunities confirmed through external evaluations
- Corporate Assessments focused on closing fleet gaps to industry excellence
 - Housekeeping, Foreign Material Exclusion, process standardization
- Focus area self-assessments results
 - Fleet-wide Operations High Intensity Training
 - Adoption of Industry best high radiation area access control practices
 - Outage-related
 - Improved long-range outage scope planning
 - Improved focus on elevated risk activities
 - Management staffing of Outage Control Center during pre-outage period

Targeted Performance Improvement

Jim Lash

*Senior Vice President and
Chief Operating Officer*



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delivering top fleet operating performance.

Targeted Improvement

■ Fleet Focus Areas

- Operations Performance
- Radiological Performance
- Outage Planning/Execution
- Equipment Reliability

■ Human Performance

Focus Area Results

Operations Performance

■ Completed Actions

- Implemented an operations crew performance review process
- Implemented an improved Component Mispositioning and Plant Status Control business practice
- Implemented a common program for Operator Burdens, Work Arounds and Control Room Deficiencies
- Focused training on demonstration of Operator Fundamentals
- Performed High Intensity Training across the fleet
- Conducted training for supervisors on Conduct of Operations
- Issued revised Handbooks to all operations on fleet operations standards

Focus Area Results

Operations Performance

■ Results

- Sites improved from Marginally Effective to Effective and Improving
- Two stations are at industry best performance in the area of Plant Status Control
- Feedback by Fleet Oversight, industry peer reviews, and station operations is that knowledge and understanding of fundamentals is good

Focus Area Results

Radiological Performance

■ Completed Actions

- Established secured access to all high radiation areas
- Improved radiation-worker behaviors
- Developed and implemented improved chemistry shutdown and startup at Davis-Besse and Beaver Valley
- Improved ALARA planning and execution at Davis-Besse and Beaver Valley during Refueling Outages
- Implemented source term reduction projects across the fleet
- Removed legacy waste from all stations

Focus Area Results

Radiological Performance

■ Results

- Five quarters without a high radiation area access violation for all three stations
- Three units have moved from fourth quartile in radiation exposure to second quartile
- Davis-Besse had its best year in terms of online dose for 2008
- Beaver Valley continues to lead the industry in online dose
- Personnel contamination events have been reduced by greater than 50%
- Task-based Radiation Work Permits and ALARA planning have reduced outage and online dose
- Aggressive use of shielding packages

Focus Area Results

Outage Planning / Execution

■ Completed Actions

- Standardized to industry best scope selection process
 - Potential scope classified as Required, Desired, Discretionary
 - Helps ensure the right work is performed in the right outage
- Standardized to industry best outage preparation milestones
- Increased focus and visibility of elevated risk activities
 - Additional schedule reviews prior to the outage
 - Readiness reviews prior to execution
- Developed site long range outage plans for Beaver Valley and Davis-Besse (Perry to be developed following 1R12)

Focus Area Results

Outage Planning / Execution

■ Results

- Davis-Besse 1R15 (January – February 2008)
 - Site best performance for three outage windows
 - Window 2 (Mode 5 to Mode 6)
 - Window 7 (Reactor refueled to Mode 5)
 - Window 8 (Mode 5 to Mode 4)
 - Initial Turbine Roll within 24 hours of original 34 day schedule
 - Zero FENOC OSHA Recordable Events
 - Radiation Exposure better than goal
 - 105 Rem versus goal of 152 Rem

Focus Area Results

Outage Planning / Execution

■ Results (continued)

- Beaver Valley 2R13 (April – May 2008)
 - Site best performance for two outage windows
 - Window 1 (Offline to Mode 5) – Industry best performance
 - Window 4 (Core Offload)
 - Equaled lowest Personnel Contamination Events (33)
 - Initial Turbine Roll on target of original 31 day schedule
 - Zero High Radiation Area violations and zero dose alarms
 - Radiation Exposure moved unit to second quartile
 - 80.9 Rem versus goal of 88 Rem

Focus Area Results

Equipment Reliability

■ Completed Actions

- Developed Maintenance Strategy Documents for >90% of components
 - in accordance with INPO AP913 and EPRI Templates
- Implemented common System Health Monitoring and Plant Health Reporting
- Implemented focused improvements in Plant Health Committee effectiveness
- Implemented common programs
 - Motor-operated valves; air-operated valves; check valves
 - Appendix J Primary Containment Leakage; In-service Testing
 - Equipment Qualification; Snubbers
 - Thermal Performance; Buried Piping
- Developed a common Fleet Component Health and Trending program – feedback on effectiveness

Focus Area Results

Equipment Reliability

■ Completed Actions (continued)

- Initiated Major Equipment Reliability Project (MERP) at the Perry Station – driving improved performance
- Focused training on Engineering Human Performance; sponsored an industry workshop at Davis-Besse
- Developed common evaluation process for Critical Equipment Failures using the Corrective Action Program
- Participated in industry development of the Equipment Reliability Index; implemented across FENOC

Focus Area Results

Equipment Reliability

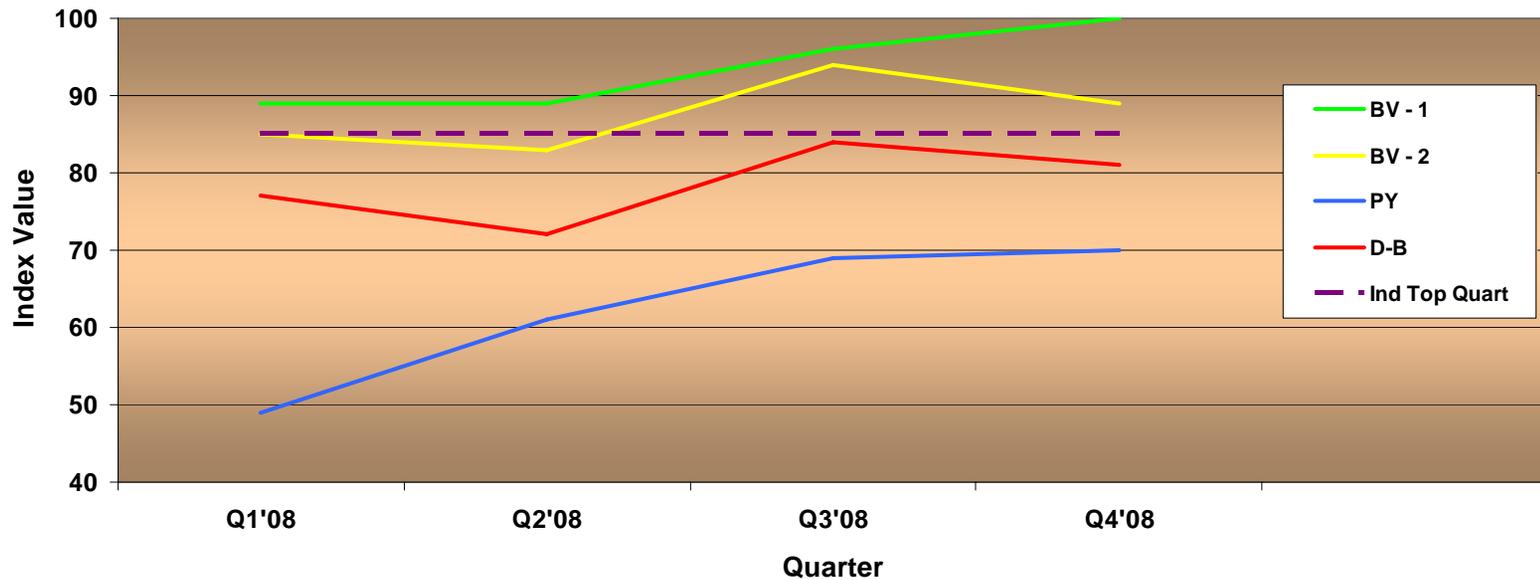
■ Results

- Equipment Reliability index for two of the four units is in industry top quartile, with improving trend at Perry
- Initiation of Emergent High Priority Work Orders has decreased at Perry
- System health improvement action average age has improved at all three stations
- Improving Unit Capability Factor and Forced Loss Rate
- Corrective and Elective Maintenance backlog improved across the Fleet; industry Top Quartile at three of the four Units.

Focus Area Results

Equipment Reliability

■ Results: Equipment Reliability Index



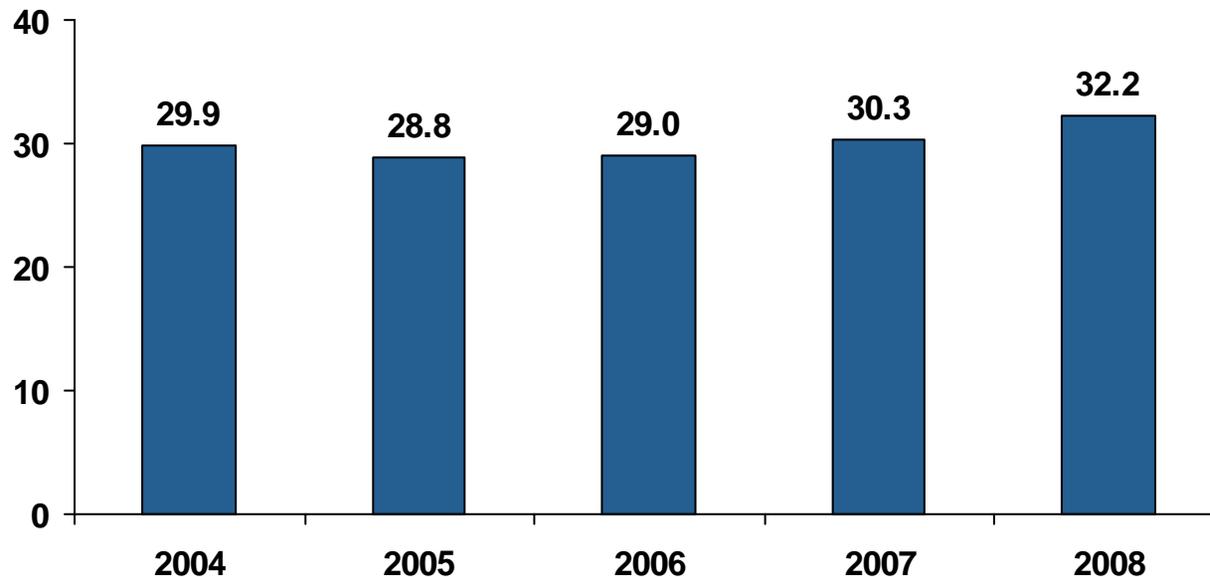
Focus Area Results

Equipment Reliability

■ Best Reliability in fleet history

— Previous best: 30,339,000 MWh (2007)

FENOC Fleet Generation



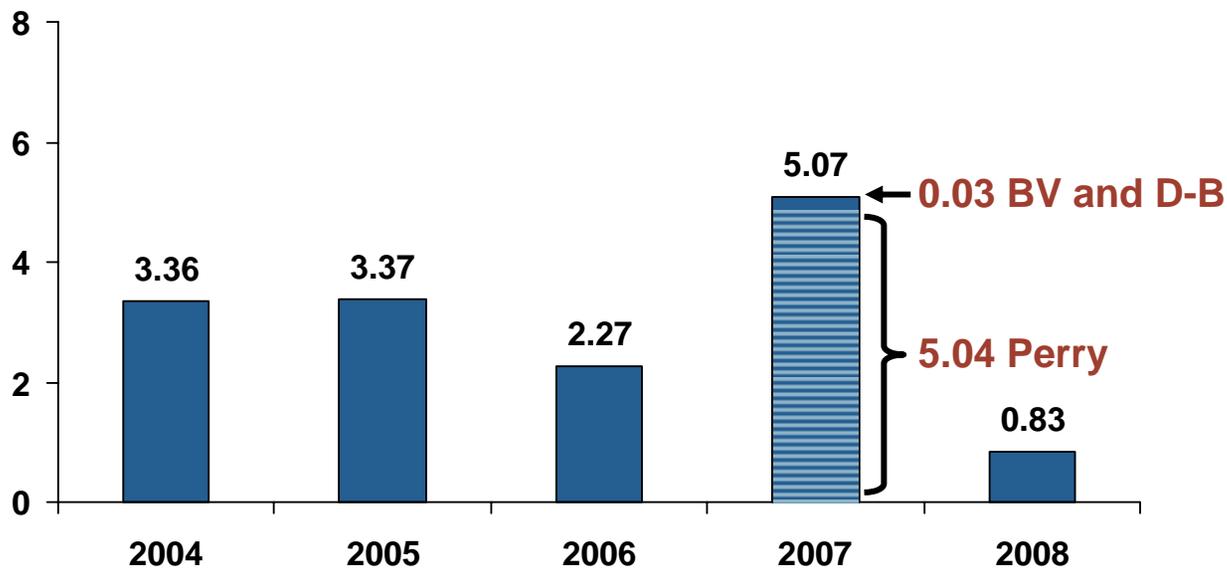
Focus Area Results

Equipment Reliability

■ Forced Loss Rate

— FENOC Fleet rate: 0.83%

FENOC Fleet Forced Loss Rate



Human Performance

- **Perry Human Performance Substantive Cross-cutting Issue**
 - First identified in 2008 Annual Assessment
 - Continued in 2008 Mid-year Assessment
 - Recognize additional potential cross-cutting themes
- **Davis-Besse addressing multiple cross-cutting aspects**
- **Cross-cutting issues monitored at each site**
 - Cross-cutting aspects indicator
 - Based on inspection findings
 - Cross-cutting aspects pre-cursors
 - Monitors licensee-identified issues in Corrective Action Program
 - Uses same bins as NRC Inspection Manual Chapter 305

Human Performance

■ Fleet Completed Actions

- Developed Fleet Human Performance Excellence Plan
- Executive Team meets monthly to review Human Performance
- Increased effectiveness of the observations program
 - Increased number of observations for Supervisors, Superintendents, and Managers
- Site Human Performance Committees review NRC cross-cutting Issues
- Updated Leadership Training to include identification of Human Performance Error Precursors, and additional focus on observations
- Human Performance Handbook issued to Fleet
 - Quick reference for Human Performance Tool application and usage

Human Performance

■ Perry Completed Actions

- Developed a Strategic Human Performance Plan
- Completed Operations High Intensity Training (HIT)
- Completed Maintenance Fundamental training for Lifting and Rigging
- Completed Foreign Material Exclusion dynamic learning activity for maintenance craft and supervisors
- Completed Chemistry Human Performance Training
- Increased levels of accountability of worker performance and results
- Aligned Human Performance Indicators to Fleet Standards

Human Performance

■ Results

- Significant decline in the number of Consequential Events in 2008 compared to 2007
 - 10 site clock resets across the Fleet in 2008, 18 clock resets in 2007
 - Beaver Valley 2008: 6 resets 2007: 6 resets
 - Davis-Besse 2008: 1 resets 2007: 4 resets
 - Perry 2008: 3 resets 2007: 8 resets
- Precursor and Section Clock error rates have declined in 2008
- Critical Field Observations have increased significantly
 - Demonstrates supervisory reinforcement of expected behaviors

Site Performance Review

Perry

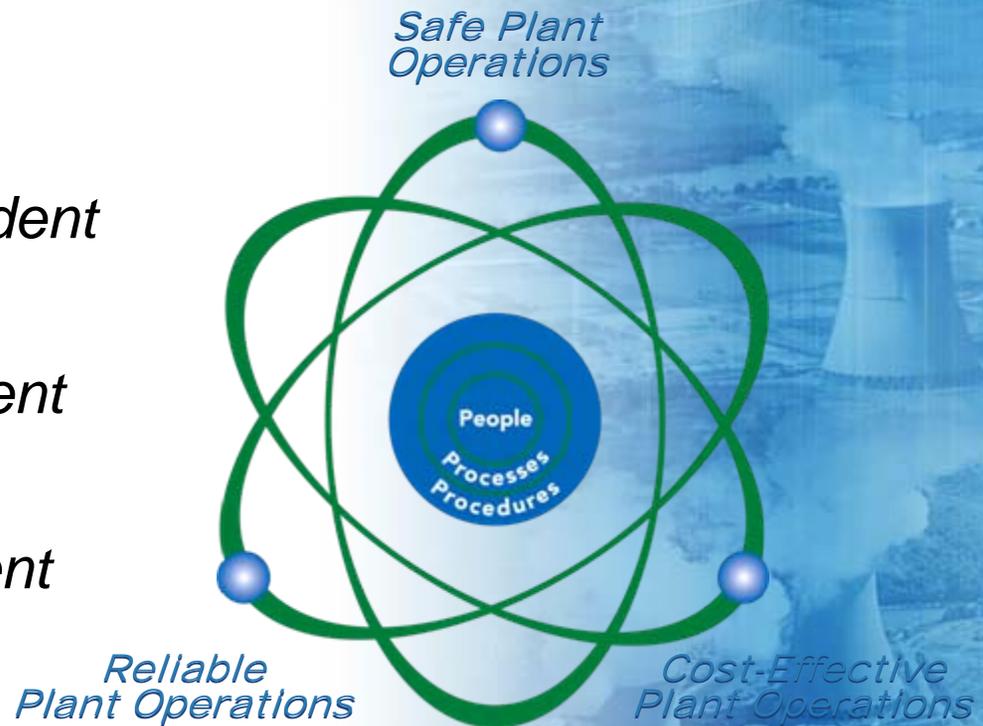
Mark Bezilla, Site Vice President

Davis-Besse

Barry Allen, Site Vice President

Beaver Valley

Pete Sena, Site Vice President



FENOC VALUE

People with a strong safety focus
delivering top fleet operating performance.

Site Performance Review

Perry – 2008

- **Site OSHA Rate = 0.65, had achieved >6.0 million hours prior to a lost time incident in October 2008**
- **Unit Capability Factor = 96.3%, Forced Loss Rate = 0.43%**
- **Successful Emergency Plan Evaluated Exercise**
- **Operations Training Program accreditation renewal**
- **Implemented successful planned maintenance outage**
 - Repaired the hotwell pump discharge valve
 - Performed summer reliability maintenance
- **Fuel status: Defect-free operation**
- **Operator Licensing Examinations:**
 - Nine candidates for January 2009 exam
 - 20 students in new class started in December 2008

Site Performance Review

Perry – Top Focus Areas

- **Safe, secure, reliable, event-free operation**
- **Committed to seven Focus Areas for improvement**
 - Organizational Alignment & Engagement
 - Equipment Reliability
 - Radiation Protection
 - Outage Improvements
 - Operations Fundamentals
 - Maintenance Fundamentals
 - Problem Identification & Resolution

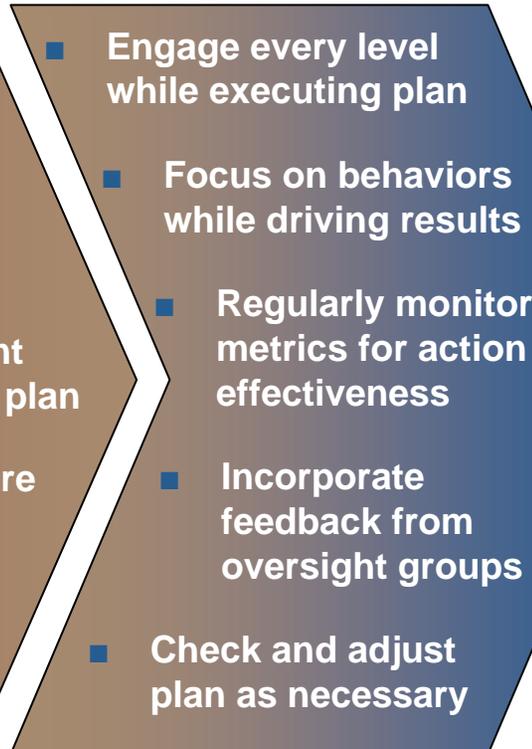
The Plan to Win:
Seven
for **SUCCESS**

Perry Accelerated Improvement Model

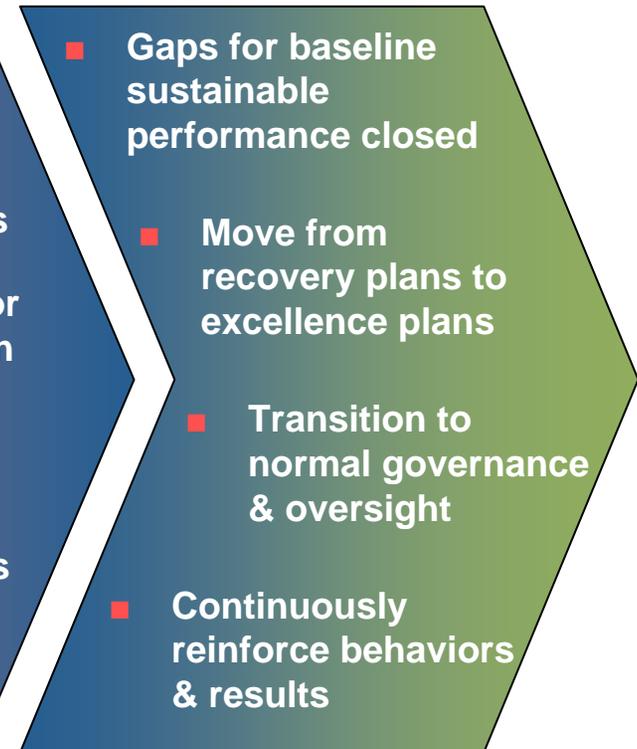
Phase 1 – Plan Development



Phase 2 – Plan Implementation (Current State)



Phase 3 – Transition



Perry Accelerated Improvement

■ Major Equipment Reliability Program (MERP) Completed Items

- Reactor Core Isolation Cooling Controllers replacement modification
- Repaired 'B' Emergency Service Water (ESW) header leak
- Replaced 'H' Condensate Septa
- Completed rewind of 'B' Control Rod Drive motor
- 'C' Control Complex Chiller Water Pump motor
- 'A' Service Water Pump refurbishment and motor rewind
- Fire Hydrants 8, 9, 18, 26, 28, 36, & 37
- Unit 2 Start-up and LH2C Transformer Deluge modification
- Fire Header Repair at Plant Access Facility
- Control Complex Chiller Cycle Timers replacement modification
- Hydrogen Water Chemistry 20-50% modification
- On-Line Noble Chemistry Injection temporary modification
- ESW Weir Wall Flow Modification
- Replaced four Radwaste Pumps
- 'B' Nuclear Closed Cooling Pump motor rewind



Perry Accelerated Improvement

■ **MERP Upcoming Items Through Refueling Outage 12**

- Station Air Compressor replacement
- Emergency Diesel Generator and Turbine CO2 Panel replacements
- Condensate Filter Septa replacement
- Transformer Deluge Logic upgrade
- On-Line Noble Chemistry improvement
- Technical Support Center Rooftop HVAC upgrade
- Annulus Exhaust Gas Treatment improvement
- Main Steam Line Tunnel HVAC Isolation Dampers replacement
- Hotwell Pump refurbishment
- Source Range Monitor Noise contingency for 1R12 development
- Nuclear Closed Cooling Pump motor refurbishment
- Reactor Feed Booster Pump refurbishment



Site Performance Review

Perry – Refuel Outage Update

- **Refueling (full core offload)**
- **10-Year In-Vessel Visual Inspection**
- **“B” Reactor Recirculation Pump motor replacement**
- **Chemical decontamination of Reactor Recirculation Loops**
- **Replace Reactor Vessel Bottom Head Drain valves**
- **Containment Integrated Leak Rate Test**
- **Alternate Decay Heat Removal System tie-in**

Site Performance Review

Perry – Looking Forward

- **Biennial Problem Identification and Resolution Inspection – in progress through January 2009**
- **Triennial Fire Protection Inspection – June 2009**
- **Industry Plant Evaluation site visit – August 2009**
- **Technical Skills Training Program accreditation renewal – December 2009**

Site Performance Review

Davis-Besse – 2008

- **Site OSHA Rate = 0.00, >9.3 million hours worked since last Lost Time Incident (> 5 years)**
- **Unit Capability Factor = 86.0%, Forced Loss Rate = 1.45%**
- **1R15 Outage Performance**
- **Completed Operations High Intensity Training**
- **Completed Confirmatory Order Independent Assessments**
 - Assessments noted continued improvement
- **Implemented 1.6% power uprate, measurement uncertainty recapture**
- **Implemented Improved Standard Technical Specifications**
- **Fuel status: Two tight defects in new type HTP fuel**
- **Operator Licensing Examinations: awarded 10 NRC licenses**

Site Performance Review

Davis-Besse – Top Focus Areas

- **Safe, secure, reliable, event-free operation**
- **Plan and prepare for Spring 2010 refueling outage**
- **Successful Emergency Plan evaluated exercise**
- **Operations Training Program accreditation renewal**
- **Effective Maintenance Strategy implementation**
- **Plant Life Extension**
- **Achieve top quartile industry performance**

Site Performance Review

Davis-Besse – Looking Forward

- **Problem Identification and Resolution Inspection – March 2009**
- **Industry Plant Evaluation site visit– April 2009**
- **Emergency Plan Evaluated Exercise – May 2009**
- **Implement NEI 99-01 Emergency Action Levels – September 2009**
- **Component Design Basis Inspection – October 2009**

Site Performance Review

Beaver Valley – 2008

- **Site OSHA Rate = 0.20, have worked >2.0 million hours without a Lost Time Incident**
- **Capability Factor: Unit 1 = 99.4% / Unit 2 = 86.7%**
- **Forced Loss Rate: Unit 1 = 0.02% / Unit 2 = 1.83%**
- **Successful Emergency Plan Evaluated Exercise**
- **Completed the Component Design Basis Inspection**
- **Successful Technical Training Programs Accreditation Renewal**
- **Completed Industry Plant Evaluation in December 2008**
- **Completed Unit 2 Power Uprate**
- **Fuel status: Defect-free operation**
- **Operator Licensing Examinations:**
 - 18 NRC licenses awarded between both Units
 - 11 students in new class started in December 2008

Site Performance Review

Beaver Valley – Refuel Outage Update

■ Unit 1 Refueling (1R19): April 2009

- Unit 1 Steam Generator insulation replacement for resolution of Generic Letter 2004-02 activities (PWR sump performance)
- Reactor Coolant Pump motor replacement
- Containment Recirculation Fan replacement

■ Unit 2 Refueling (2R14): October 2009

- Unit 2 Steam Generator insulation replacement for resolution of Generic Letter 2004-02 activities
- Reactor Vessel Head inspection
- Main Steam Isolation Valve overhaul
- Main Steam Safety Valve replacements

Site Performance Review

Beaver Valley – Top Focus Areas

- **Safe, secure, reliable, event-free operation**
- **Improved people focus**
- **NRC License Renewal approval**
- **Safe and successful 1R19 and 2R14 outages**

Site Performance Review

Beaver Valley – Looking Forward

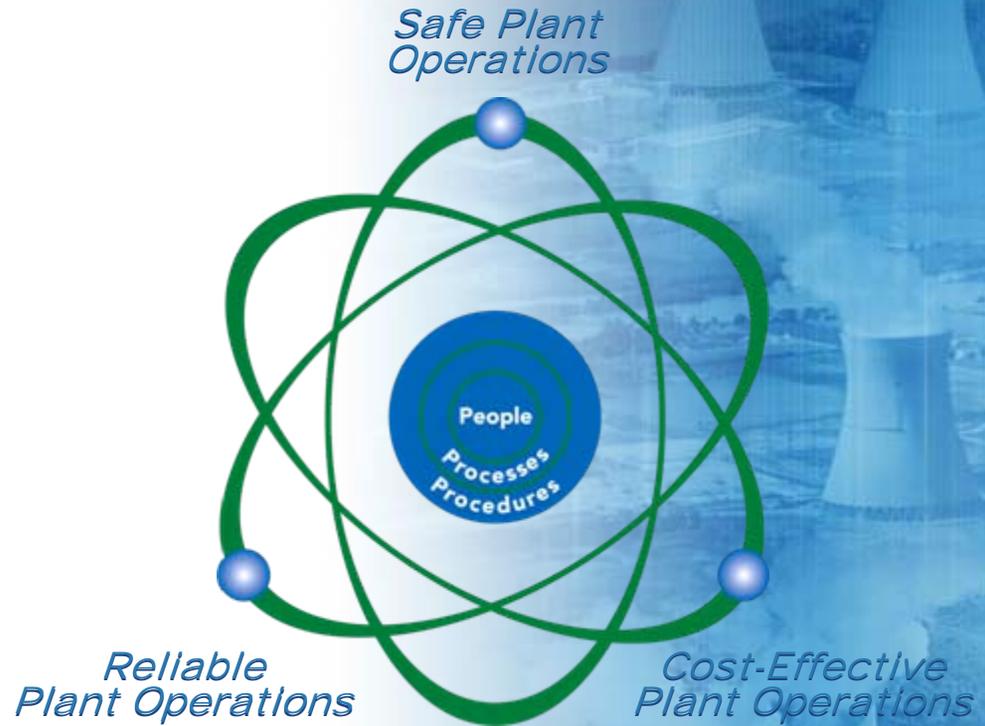
- **License Renewal ACRS Sub-Committee – February 2009**
- **Triennial Fire Protection Inspection – July 2009**
- **Problem Identification and Resolution Inspection – August 2009**
- **Unit 2 Spent Fuel Pool Re-Rack – 2010**

Closing Comments

Joe Hagan

President and

Chief Nuclear Officer



FENOC Vision

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FENOC Fleet Overview



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