Fort Calhoun Station
Driving Through Restart

Plan for Sustained Improvement

August 27, 2013

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Topics for Discussion

- Plant status and major remaining work
- Fort Calhoun Station Performance Improvement Policies and Procedures
- Plan for Sustained Improvement
- Key Drivers for Achieving and Sustaining Excellence
- Exelon Nuclear Management Model (ENMM)
- Integration of Fort Calhoun Station into the Exelon Nuclear Fleet

Current Plant Status and Remaining Work

- Core re-load completed July 29, 2013
- Reactor vessel head installed August 25, 2013
- Critical path work
  - Tornado missile protection modifications
  - High-energy line break modifications
    - CVCS letdown and charging lines
    - Steam generator blow down lines
  - Containment internal structures
- Plant heat-up with non-nuclear heat – September
- Submit Integrated Restart Report – After heat-up
- Ready for restart

Regulatory Documents Governing Restart

- December 13, 2011: NRC letter to OPPD documenting transition from the Reactor Oversight Process to Inspection Manual Chapter (IMC) 0350 – (shutdown plant with significant event involving switchgear fire)
- June 11, 2012: NRC Confirmatory Action Letter with Restart Checklist issued, updated February 26, 2013
- July 9, 2012: OPPD Fort Calhoun Station Integrated Performance Improvement Plan, Rev. 3 submitted including Restart Checklist Implementation Strategy, Rev. 5 submitted June 19, 2013
- **July 29, 2013: OPPD Fort Calhoun Station Plan for Sustained Improvement, Rev. 0 submitted**

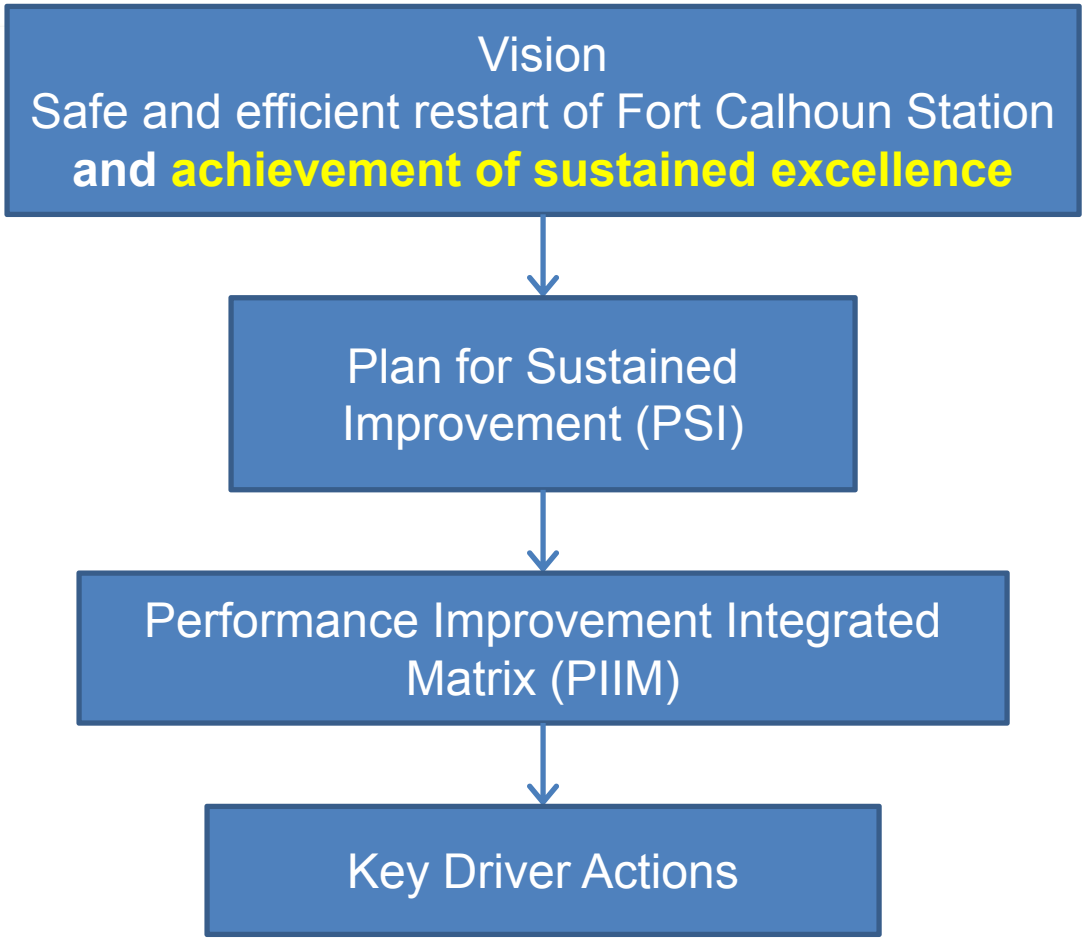
Restart Decision-Making Criteria

- Confirmatory Action Letter commitments addressed and Restart Checklist items resolved
- Fundamental organizational weaknesses addressed and improving
- Plant, people, processes and departments are ready for restart
- Independent assessments completed
  - Nuclear Oversight Department
  - Corporate Governance and Oversight Committee
  - Nuclear Safety Review Board
- Post-Restart Plan for Sustained Improvement in place
- Integrated Restart Report Submitted to NRC

Early Implementation of Exelon Performance Improvement (PI) Program

- CNO/Site VP established PI policy for Fort Calhoun requiring that personnel shall
  - Demonstrate excellence in performance improvement
  - Embrace continuous improvement
  - Exemplify problem prevention, detection and correction
  - Strive to achieve high levels of operational performance
- PI program and procedures issued to implement the policy

Plan for Sustained Improvement



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Plan for Sustained Improvement

- PSI will continue improvement momentum
- Outcome is achieving sustained excellence
- PSI implemented using the PIIM
  - OPPD and Exelon senior executives reviewed and fully support the PSI
  - Fleet-, Site- and Department-level action plans address gaps to excellence – Action plans owned by line managers
  - Fort Calhoun Station Senior Leadership Team (SLT) will review progress at least monthly
  - OPPD and Exelon corporate executives will review progress during periodic Management Review Meetings
  - Nuclear Oversight and Nuclear Safety Review Board will provide independent oversight of progress
  - Action plans will not be closed until SLT concludes outcomes are achieved
- Excellence will be cemented by full implementation of the ENMM and integration into the Exelon fleet

Early Implementation of Performance Improvement Program

- Performance Improvement Integrated Matrix (PIIM) key component of PI process
  - Brings focus on gaps to excellence and plans to close gaps
  - Predictable – reliable – continually updated
  - Systematic approach utilizing full range of PI tools to address gaps
  - Planning, analyzing and monitoring all driven by the PIIM
  - Facilitates effective management oversight
  - Computerized PIIM system directly connected to the Corrective Action Program computerized system

Plan for Sustained Improvement

- Key Drivers for Achieving and Sustaining Excellence identified
- Key Drivers provided as regulatory commitments for Restart Confirmatory Action Letter
- Key Drivers address actions that ensure
  - Corrective actions are effective
  - Actions to prevent recurrence are effective
  - Sustained performance improvement

Addresses those issues in Restart Checklist, safety-significant Fundamental Performance Deficiencies and other critical performance improvement areas

Key Drivers for Achieving and Sustaining Excellence

- Organizational effectiveness, safety culture, and safety conscious work environment
- Problem identification and resolution
- Performance improvement and learning programs
- Design and licensing basis control and use
- Site operational focus
- Procedures
- Equipment performance
- Programs
- Nuclear oversight
- Transition to the ENMM and integration into the Exelon Nuclear Fleet

Key Drivers

- **Organizational effectiveness**, safety culture, and safety conscious work environment – Actions taken
  - Entered into an Operating Service Agreement with Exelon Nuclear
  - Assessed leadership capabilities and made needed changes
  - Aligned organization to Vision, Mission & Values
  - Established and trained leadership on corporate governance, oversight, support and perform model (GOSP)
  - Implemented GOSP accountability model
  - Implemented GOSP management model with emphasis on nuclear safety and continuous improvement
  - Implemented performance management, succession planning, knowledge retention, and strategic workforce planning
  - Created organizational effectiveness metric

Key Drivers

- Organizational effectiveness, **safety culture, and safety conscious work environment** – Actions taken
  - Trained managers, supervisors, and personnel on Safety Culture/SCWE
  - Implemented the fleet Employee Concerns Program
  - Implemented Differing Professional Opinion Process
  - Implemented fleet Nuclear Safety Culture Monitoring Panel
  - Implemented 2Cs meetings with Site VP (Compliments and Concerns)
  - Performed site-wide safety culture focus group interviews
  - Established pulse surveys and industry leading safety culture metric

Key Drivers

- Organizational effectiveness, safety culture, and safety conscious work environment – Results achieved
  - Improving trend in organizational effectiveness
  - Fleet support and challenge on station issues
  - Improving trend in safety culture and safety conscious work environment
  - Operations department is leading the station in safety culture
  - Most departments have made significant improvement in safety culture – targeted department-level improvement actions being implemented
- Ready for restart

Key Drivers

- Organizational effectiveness, safety culture, and safety conscious work environment – Plans going forward
  - Continue the safety culture pulse survey metric
  - Focused safety culture improvement action granularity at department level
  - External assessments annually for three years on station safety culture
  - Continue to monitor the organizational effectiveness metric during plant operations
  - External assessment of organizational effectiveness six months after restart

Key Drivers

- Problem identification and resolution – Actions taken
  - Corrective Action Program (CAP) root cause analysis performed early 2012
    - Enhanced procedures, staffing and training
    - Improved Station and Department Corrective Action Review Boards (SCARB and DCARB)
    - Implemented detailed Exelon Nuclear performance monitoring tools
    - Marked improvement in problem identification, root and apparent cause quality, and timely action closure in targeted work groups

Key Drivers

- Problem identification and resolution – Actions taken
  - Additional improvement necessary – Second CAP root cause analysis completed in June 2013

- Station personnel not consistently following CAP procedures and station leadership not consistently reinforcing CAP procedure compliance
- CAP strategy for improving performance not fully implemented and understood at all organizational levels
- Station trending time consuming and not fully effective

Key Drivers

- Problem identification and resolution – Results achieved
  - Problem identification
    - 16,690 condition reports generated in 2013 (to date)
    - Station engagement ratio at 70% (white rating) and improving
    - SLT observations of CAP meetings at 10 per month (green rating)
  - Issue Resolution
    - DCARB closure rejection rate at 13% and improving (white rating)
    - DCARB RCA rejection rate at 11% and improving (white rating)
    - RCA products demonstrating improvement
- Ready for restart

Key Drivers

- Problem identification and resolution – Plans going forward
  - CAP behavior improvement plans

- Reinforce CAP fundamentals / accountability model with all station personnel
- Conduct additional training for Root Cause Analysts and Station and Department Corrective Action Review Board members
- Implement additional department CAPCOs and CAP advocates
- Continuous CAP performance monitoring through CAP Health and Trend Reports

Key Drivers

- Design and Licensing Basis Control – Actions completed
  - Design and configuration control was identified as a Fundamental Performance Deficiency
  - Root cause analysis was completed in October 2012
  - Scope of review covered 2007 to 2012 and identified causes and actions to improve performance
  - Additional items have been identified by the NRC and OPPD since October 2012
    - Accuracy and completeness of the design and licensing basis challenged the engineers' efficiency at performing key station processes
  - A new design and licensing basis root cause analysis was completed in 2013
  - Scope of the review covered the period from 1968 when the construction permit was issued to 2013

Key Drivers

- Design and licensing basis control and use - Actions completed
  - Developed key calculation review program for accuracy and consistency
    - Completed Phase 1, Phase 2 in progress
  - Trained engineers and operators in utilizing the design and licensing basis for operability determinations and safety screenings/evaluations
  - Performed structural walk downs of safety-related systems to ensure consistency with design drawings
  - Monitoring engineer and operator work product quality utilizing review comments and scores from independent Engineering Assurance Group
- Ready for restart

Key Drivers

- Design and licensing basis control and use - Actions going forward
  - Define model for form and content of design basis and licensing basis documents
  - Reconstitute design and licensing basis in a desktop available platform
  - Train station staff on utilizing new design and licensing basis resources
  - Perform annual risk-significant system design reviews until completion of reconstitution
  - Maintain Engineering Assurance Group while necessaryto provide independent oversight of engineering work product quality

Key Drivers

- Design and licensing basis control and use – Engineering Department Performance
  - Staffing
    - 22 of 27 system engineers fully qualified – was 7 in 2012
    - 20 of 22 design engineers fully qualified – was 15 in 2012
    - 14 of 17 programs engineers fully qualified
    - Additional design engineering supervision added
    - Engineering Programs and Design Engineering Manager positions filled
  - System and Program Health Reports prepared quarterly
    - Challenged and approved by Plant Health Committee
  - Engineering Assurance Group strengthened and effective
    - Feedback to engineers and supervisors across engineering
    - Comprehensive engineering work product quality performance indicators
- Ready for restart

Key Drivers

- Procedures – Actions taken
  - Procedure revision process adjusted to ensure procedure content and accuracy are addressed
  - Revision criteria established based on
    - Known issues and extent of condition
    - Risk significance
    - Support of event mitigation
  - Reviewed and revised procedures (over 200)
    - Emergency and Abnormal Procedures (EOP / AOP)
    - Annunciator Response Procedures (ARP)
    - Operating Instructions (OI)

Key Drivers

- Procedures – Results achieved
  - Procedures revised to minimize likelihood of knowledge-based errors
    - Additional performance details developed in attachments
      - Abnormal Operating Procedures (AOP)
      - Emergency Operating Procedures (EOP)
    - Level of detail and accuracy improved
      - Alarm Response Procedures (ARP)
  - Incorporated industry best practices
  - Training operators on new procedures

Key Drivers

- Procedures – Plans going forward
  - Continue to
    - Incorporate operator input
    - Reinforce procedure usage expectations
    - Reinforce culture of rule-based execution
    - Use field operators and simulator for verification and validation of actions and confirming procedure flow
    - Integrate procedure revisions
      - Train new operators to revised documents
      - Coordinate plant training with transition to revised format
  - Institute enhanced review of maintenance work order instructions

Key Drivers

Equipment Performance – Actions Taken

Plant Health Committee (PHC)

- Changed PHC quorum requirements to include senior managers
- Revised PHC procedure for alignment with AP-913 Equipment Reliability and AP-928 Work Management attributes
- Revised PHC agenda to focus on oversight of equipment reliability programs and processes
- Increase PHC meeting frequency to weekly to align with industry standards

Performance Monitoring

- System walk downs are now regularly performed by System Engineers
- Supervisors perform observations during system walk downs to ensure station expectations are being met
- Start-up monitoring plans have been developed for systems following extended shutdown

Key Drivers

Equipment Performance – Actions taken

Equipment Service Life (ESL)

- Project team established - Identified critical equipment/components
- Replaced 989 equipment/components (breakers, relays, valves)
- Completed review of over 10,000 components planned for post start-up

Maintenance Rule / Preventive Maintenance Program

- Action plans for equipment in Maintenance Rule (a)(1)
  - Majority are in monitoring status
  - Systems in long term shutdown are being monitored in (a)(1)
  - Condition Reports reviewed daily for Maintenance Rule issues
- Backlog of preventative maintenance tasks eliminated

Key Drivers

Equipment Performance – Results achieved

Significantly improved equipment reliability by repairing or replacing a large number of components

- Significant work on both Emergency Diesel Generators including voltage regulator modifications
- Refurbished 4160V and 480V busses
- Replaced 4160V breakers on busses 1A1 and 1A3
- Replaced or refurbished Reactor Protection System power supplies
- Replaced Chemical and Volume Control System piping and supports
- Upgraded turbine controls to digital system

Key Drivers

Equipment Performance – Results achieved

Additional actions include

- Completed System Health Readiness Reviews for restart
- Revised system engineering quarterly system health process to be in line with industry standards
- Performance monitoring identified a low level vibration issue with Raw Water Pump AC-10B prior to failure
- Bias for action demonstrated on recent plant issues including HPSI Pump SI-2B low flow issues and system imbalance, and HCV-2983 excess leakage

- Ready for restart

Key Drivers

Equipment Performance – Plans going forward

- Adopt Exelon Equipment Reliability processes and procedures
  - Performance Monitoring Plans, Walk Down Plans, and System Notebooks in System IQ
  - Additional programmatic enhancements
    - Margin Management Program
    - Obsolescence Program
    - Component Health Program
    - Critical Component Failure Report
    - Predictive Maintenance (Plant IQ) Program
    - Vulnerability Review Process
    - Troubleshooting Process

Key Drivers

- Nuclear Oversight – Actions taken
  - Conducted a root cause analysis in 2012
  - Established safety-focused OPPD strategic plan
  - Early implementation of the ENMM
  - Documented expectations and roles and responsibilities
  - Implemented Exelon Nuclear Safety Review Board (NSRB)
  - Established Nuclear Oversight Department (NOS)
  - Strengthened confidential Employee Concerns Program (ECP)

Key Drivers

- Nuclear Oversight – Results achieved
  - Expectations clear
  - NOS intrusive and actively engaged
  - NOS goes beyond minimum regulatory requirements
  - Focus on values and behaviors that achieve excellence
  - NSRB intrusive and effective
  - Fort Calhoun leadership responsive to NOS and NSRB findings
  - Staff utilizing ECP

- Ready for restart

Key Drivers

- Nuclear Oversight – Plans going forward
  - Effectiveness review of corrective actions and actions to prevent recurrence
  - Performance indicator effectiveness review
  - Nuclear industry evaluation program assessment

Key Drivers

- Transition to the Exelon Nuclear Management Model (ENMM) and integration into the Exelon Nuclear Fleet
  - Implementation of the ENMM and full integration into the Exelon fleet will cement sustained excellence in safety and efficiency of operation

Exelon's Philosophy on Nuclear Power Plant Leadership

- Exelon uses a comprehensive management system known as the Exelon Nuclear Management Model
  - To ensure top safety performance and operational efficiency in normal, outage, transient, and emergency situations
  - To establish a strong safety culture

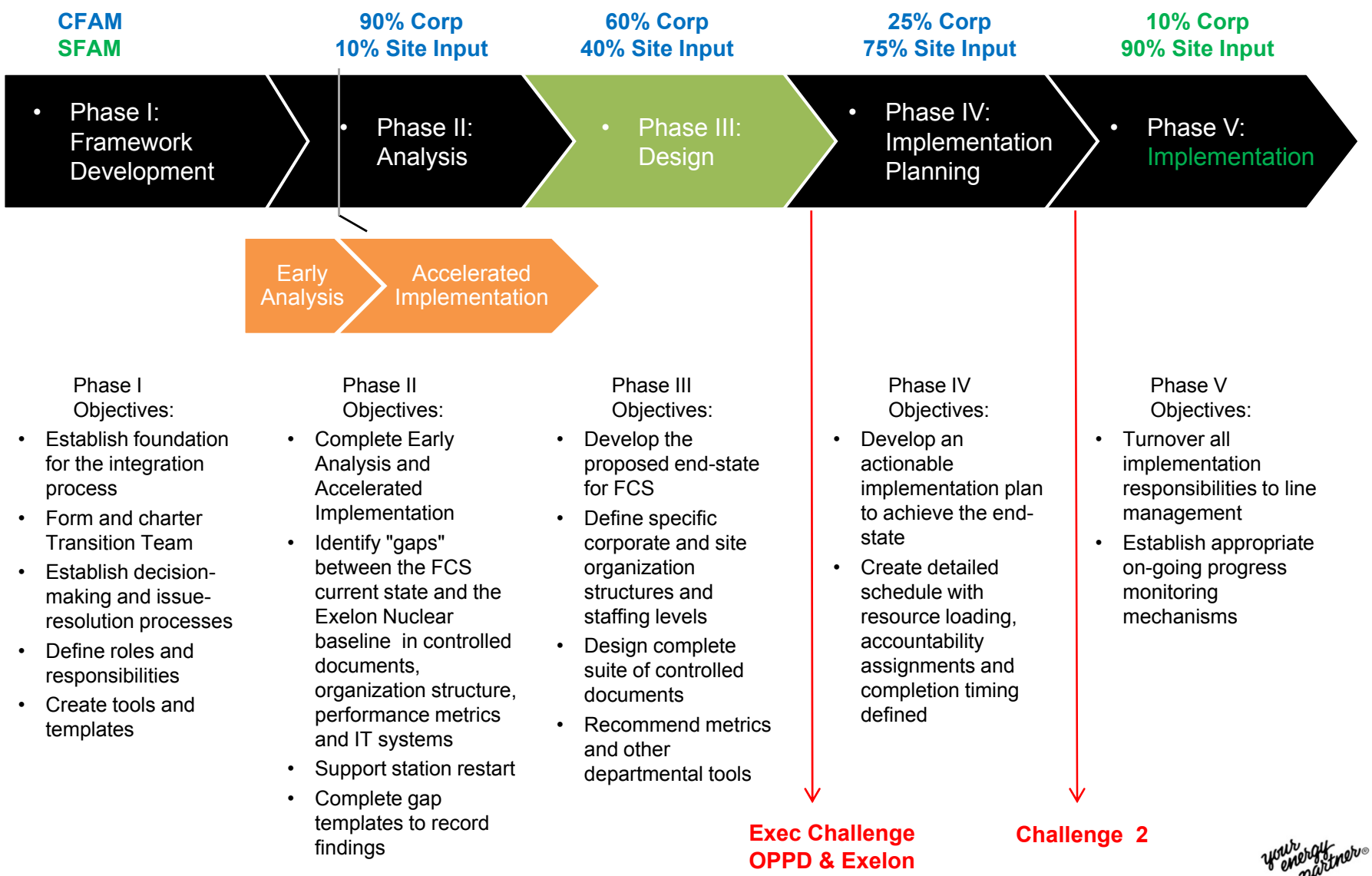
The Exelon Nuclear Management Model contains all necessary policies, programs and procedures, but its success is driven by a **strong and intrusive leadership team**, a **passion for excellence** and **effective independent oversight**

Exelon Nuclear Management Model

- Model defines how Exelon works
  - Common vision and shared values
  - Conduct business
  - Set priorities
  - Develop and execute plans
  - Monitor and assess performance
- Playbook for driving standardization
  - Gets everyone on the same page
  - Defines the “One way, best way” to run the business
  - Aligns the corporation and stations eliminating localized differences
  - Establishes processes for continuous assessment and improvement
  - Documents progress and change
  - Manage Fleet as single cohesive entity
  - **Passion for Excellence**

Integration of Fort Calhoun Station into the Exelon Fleet

- Integration managed by joint OPPD/Exelon management team
- Corporate and Site Functional Area Managers and Subject Matter Experts completing integration activities
- Integration organized around 27 functional areas



Fort Calhoun Integration Status

- Framework Development
  - Complete
- Analysis
  - Complete
- Early Implementation
  - Nuclear oversight
  - Security
  - Human performance
  - Regulatory assurance
  - Performance improvement
  - Records management
  - Fort Calhoun Station performance challenged daily during Midwest fleet morning calls

Fort Calhoun Integration Status

- Integration Design
  - Executive challenge meetings in progress
  - Scheduled to be completed by October 29, 2013
- Implementation Planning
  - Development of Level 3 schedules in progress
  - Scheduled to be completed by December 20, 2013
- Implementation
  - Scheduled to commence 30 days after achieving 100% power
  - Scheduled to be completed by March 31, 2015

Progress Toward Restart

- Core re-load completed July 29, 2013
- Reactor vessel head installed August 25, 2013
- Plant heat-up with non-nuclear heat – September
- Submit Integrated Restart Report – After heat-up
- Ready for restart

Closing Remarks

- Today we updated you on
  - Plant status and major remaining work
  - Fort Calhoun Station Performance Improvement Policies and Procedures
  - Plan for Sustained Improvement
  - Key Drivers for Achieving and Sustaining Excellence
  - Exelon Nuclear Management Model
  - Integration of Fort Calhoun Station into the Exelon Nuclear Fleet