Outline of Presentation

- Legacy Duke Energy nuclear generation performance in 2011
- Merged nuclear fleet
- Nuclear generation integration goals and activities
- New nuclear development
- Update on Nuclear Regulatory Commission (NRC) findings at Oconee in 2010 and 2011
Key Legacy Duke Energy Accomplishments in 2011

- Best ever personnel safety performance in nuclear generation
- Nuclear fleet capacity factor 93% (12\textsuperscript{th} year in a row more than 90%)
- Lowest operating cost among United States nuclear fleets
- Digital reactor protection system and engineered safeguards system installation at Oconee Nuclear Station
  - First safety-related digital instrumentation and control system in the U.S.
  - Platts Global Energy Award for Engineering Project of the Year
  - Nuclear Energy Institute “Best of the Best” Top Industry Practice Award
Post-Merger Duke Energy at a Glance

- $100 billion in total assets
  - $49 billion market capitalization

- Largest U.S. regulated customer base
  - 7.1 million electric customers
  - 500,000 gas customers

- More than 58,000 MW of diversified generating capacity

- Largest U.S. regulated nuclear fleet

- Commercial interest includes:
  - International
  - Renewables
Merged Nuclear Fleet

- **Brunswick Nuclear Plant**
  - Capacity: 1,875 megawatts
  - Location: Southport, N.C.
  - Number of Units: 2 BWRs
  - Commercial Date: 1975
  - License Expires: 2036, 2034

- **Crystal River Nuclear Plant**
  - Capacity: 860 megawatts
  - Location: Crystal River, Fla.
  - Number of Units: 1 PWR
  - Commercial Date: 1977
  - License Expires: 2016

- **Harris Nuclear Plant**
  - Capacity: 900 megawatts
  - Location: New Hill, N.C.
  - Number of Units: 1 PWR
  - Commercial Date: 1987
  - License Expires: 2046

- **McGuire Nuclear Station**
  - Capacity: 2,200 megawatts
  - Location: Huntersville, N.C.
  - Number of Units: 2 PWRs
  - Commercial Date: 1981
  - License Expires: 2041, 2043

- **Oconee Nuclear Station**
  - Capacity: 2,538 megawatts
  - Location: Seneca, S.C.
  - Number of Units: 3 PWRs
  - Commercial Date: 1973
  - License Expires: 2033, 2034

- **Robinson Nuclear Plant**
  - Capacity: 724 megawatts
  - Location: Hartsville, S.C.
  - Number of Units: 1 PWR
  - Commercial Date: 1971
  - License Expires: 2030

- **Catawba Nuclear Station**
  - Capacity: 2,258 megawatts
  - Location: York, S.C.
  - Number of Units: 2 PWRs
  - Commercial Date: 1985
  - License Expires: 2043
Nuclear Generation Organization

Nuclear Generation corporate office in Charlotte, N.C.

Legacy Progress

Legacy Duke
Fleet Integration Challenges

- Implement a common fleet operating model
  - Establish a common vision, mission, core values and strategies
  - Define how
    - Business is conducted
    - Priorities are set
    - Programs are defined and implemented
    - Performance is monitored and assessed
  - GOSP – governance, oversight, support and perform

- Integrate systems, processes and procedures
  - Identify and establish best practices
  - Enable synergies from operating a large nuclear fleet

- Goal – Attain strong, cost-effective, sustainable performance across the fleet
Merger Focus Areas for Nuclear Generation

- **Functional consolidation**
  - Consolidation of duplicate functions
  - Staff reduction where redundancies exist

- **Systems consolidation**
  - Information technology systems

- **Operational best practices**
  - Significant process re-design, e.g., modification process improvements

- **Supply chain**
  - Leverage volume of purchasing (economics of scale)
Integration Activity Examples

- Common scheduling software for all on-line and refueling outage work
- Common radiation protection software for dose projections
- In-house nuclear core reload design
- In-house fuel handling
- New fleet procedures such as Fleet Operating Model, Corrective Action Program, Integrated Performance Assessment
New Nuclear Development

- Applications for six new AP1000 reactors at three sites
  - Lee
    - Cherokee County, S.C. (near Gaffney)
    - No operating reactors at site
  - Levy
    - Levy County, Fla.
    - No operating reactors at site (near Crystal River)
  - Harris
    - New Hill, N.C. (near Raleigh)
    - Existing plant site

- Recent U.S. Court of Appeals remand of NRC Waste Confidence Rule
Oconee Regulatory Actions – Standby Shutdown Facility (SSF)

Background

- **ASW**
  - Injects through OTSG upper nozzles
- **RC Makeup**
  - Injects through RCP seals
  - 29 gpm (nominal)
- **SSF letdown line**
- **Pressurizer heaters**
  - Subset of normal pressurizer heaters are powered from the SSF
Oconee NRC Regulatory Action – 2010 (SSF Letdown Line)

- Issue – Testing in 2009 indicated insufficient flow in the SSF letdown line for Unit 1
  - Test was follow-up from an unrelated extent of condition evaluation for stagnant lines
  - Foreign material (a gasket from an upstream valve) had clogged a strainer in the SSF letdown line
  - Initial evaluation was that problem was confined to Unit 1
  - Subsequent evaluation and examination indicated the same problem existed at Units 2 and 3
Oconee NRC Regulatory Action – 2010 (SSF Letdown Line)

- Immediate corrective actions
  - Removed strainer on Unit 1 during refueling outage in October 2009
  - Reduced power to 20% and removed strainer on Units 2 and 3 in February 2010

- Nuclear Safety Excellence Plan
  - Operability Improvement Project
  - Corrective Action Program Improvement Project
  - Safety Culture Survey
Oconee NRC Regulatory Action – 2010 (SSF Letdown Line)

- **NRC response – Three violations**
  - Yellow finding (substantial importance to safety) – failure to ensure SSF operability on all three units
  - White finding (low to moderate significance to safety) – failure to identify and correct problem on Units 2 and 3 after identification on Unit 1
  - Severity level III violation of 10 CFR 50.9 (providing complete and accurate information)

- **Follow-up 95002 inspection December 2010**
  - Reviewed root causes, extent of condition and corrective actions
  - Closed Yellow and White findings
  - Returned Oconee to Licensee Response Column of the Reactor Oversight Process
Oconee Regulatory Actions – 2011 (Pressurizer Heater Breakers)

- Issue – Oconee self-identified that circuit breakers between the SSF power source and certain pressurizer heater elements were not properly qualified to function in an adverse containment environment
  - Alternative means for shutting down the units were available
  - SSF declared inoperable, but restored to operability in June by replacing breakers
  - SSF declared inoperable in July after subsequent testing indicated replacement breakers may not be able to withstand adverse containment environment
  - SSF restored to operability in August when breakers were replaced with qualified fuses

- Immediate corrective actions
  - Replaced breakers with new design breakers
  - Credited operator actions in the event breakers failed
  - Ultimately replaced breakers with qualified fuses
Oconee Regulatory Actions – 2011 (Pressurizer Heater Breakers)

- NRC response – Two violations
  - Yellow finding (substantial importance to safety) – failure to maintain design control of the SSF pressurizer heater breakers
    - Classified as “old design issue;” did not impact NRC action matrix
  - Green finding (very low safety significance) – breakers inappropriately declared operable following initial discovery of problem

- Licensee Response Column of the NRC Action Matrix
- Follow-up 95002 inspection end of August 2012
- SSF design and licensing review
NRC Regulatory Oversight Program Status as of the 3rd Quarter 2012

- Licensee Response Column
  - Catawba Units 1 and 2
  - Crystal River
  - Harris
  - McGuire Units 1 and 2
  - Oconee Units 1, 2 and 3
  - Robinson

- Regulatory Response Column
  - Brunswick Units 1 and 2
Questions?