



DUKE ENERGY NUCLEAR PROGRAMS UPDATE FOR THE SOUTH CAROLINA GOVERNOR'S NUCLEAR ADVISORY COUNCIL

Steve Nesbit
Director, Nuclear Policy and Support

September 6, 2012

Outline of Presentation

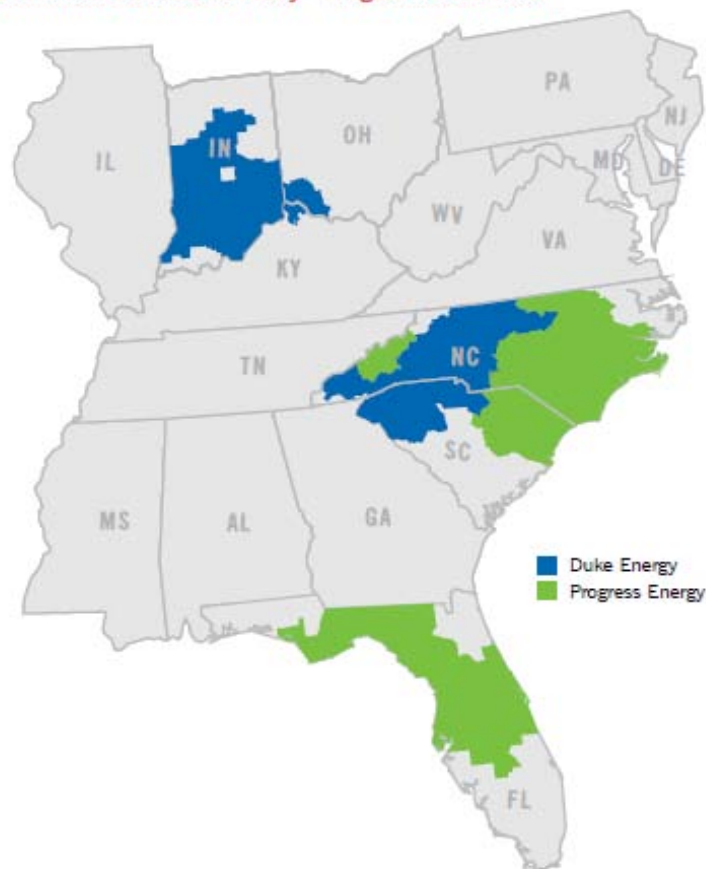
- Legacy Duke Energy nuclear generation performance in 2011
- Merged nuclear fleet
- Nuclear generation integration goals and activities
- New nuclear development
- Update on Nuclear Regulatory Commission (NRC) findings at Oconee in 2010 and 2011

Key Legacy Duke Energy Accomplishments in 2011

- Best ever personnel safety performance in nuclear generation
- Nuclear fleet capacity factor 93% (12th 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

Combined Service Territory – Regulated Utilities:



- \$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



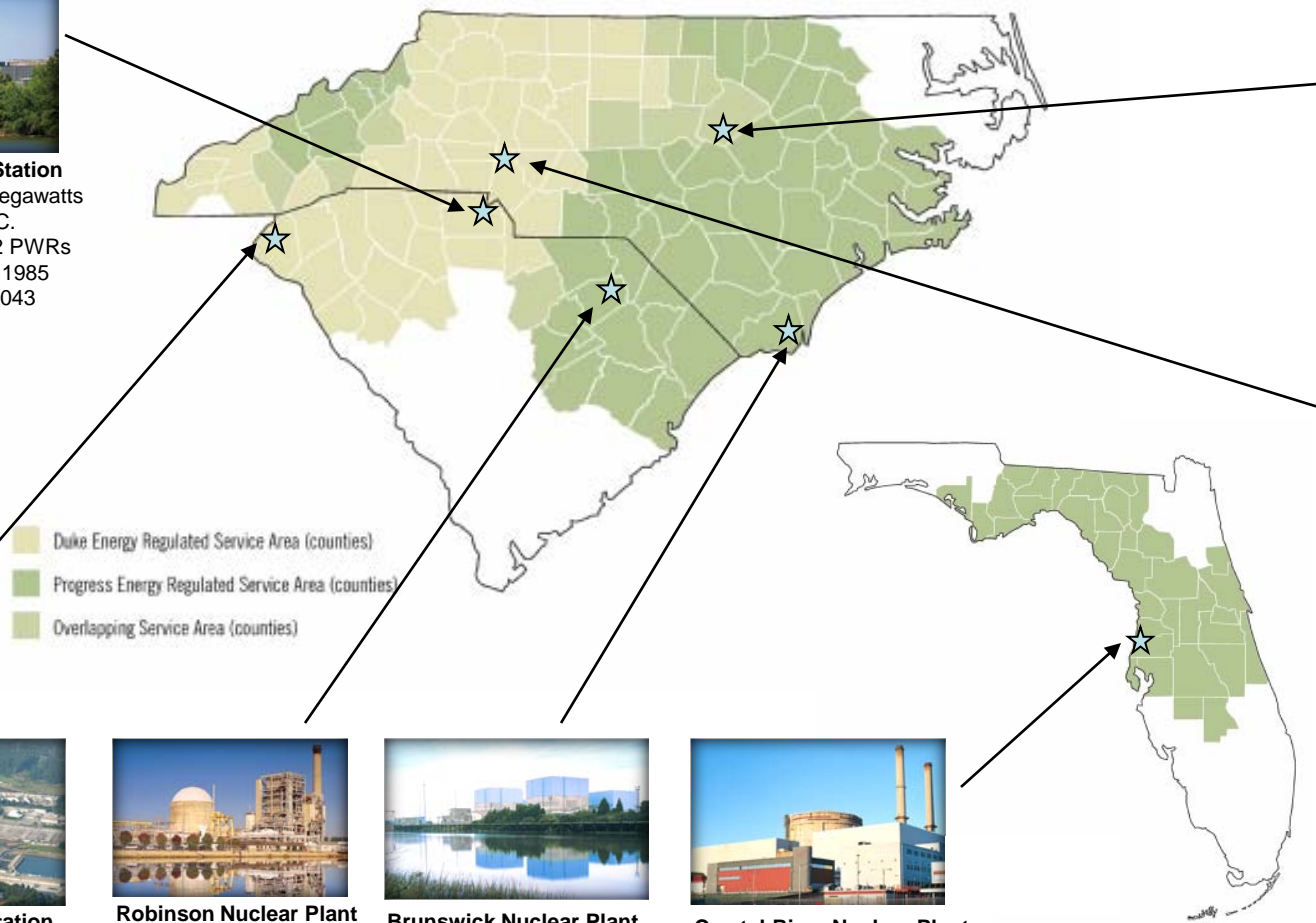
Catawba Nuclear Station
 - Capacity: 2,258 megawatts
 - Location: York, S.C.
 - Number of Units: 2 PWRs
 - Commercial Date: 1985
 - License Expires: 2043



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

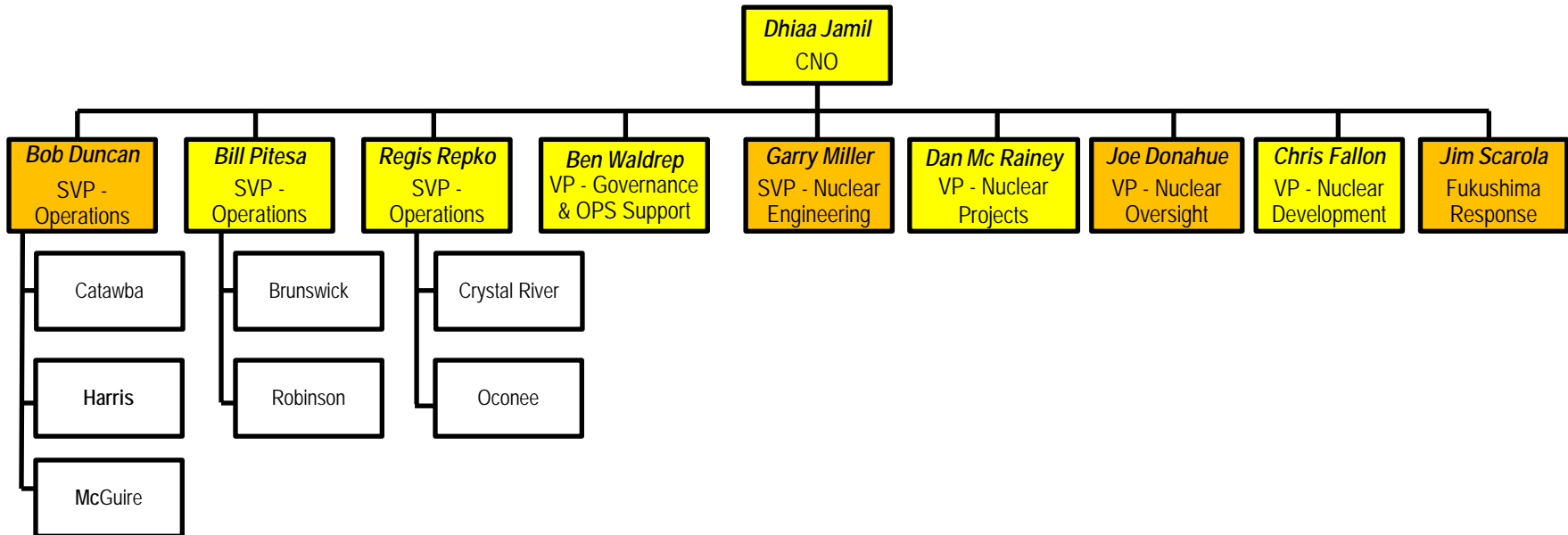


Brunswick Nuclear Plant
 - Capacity: 1,875 megawatts
 - Location: Southport, N.C.
 - Number of Units: 2 BWRs
 - Commercial Date: 1975
 - License Expires: 2036, 2034



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

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 (economies 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

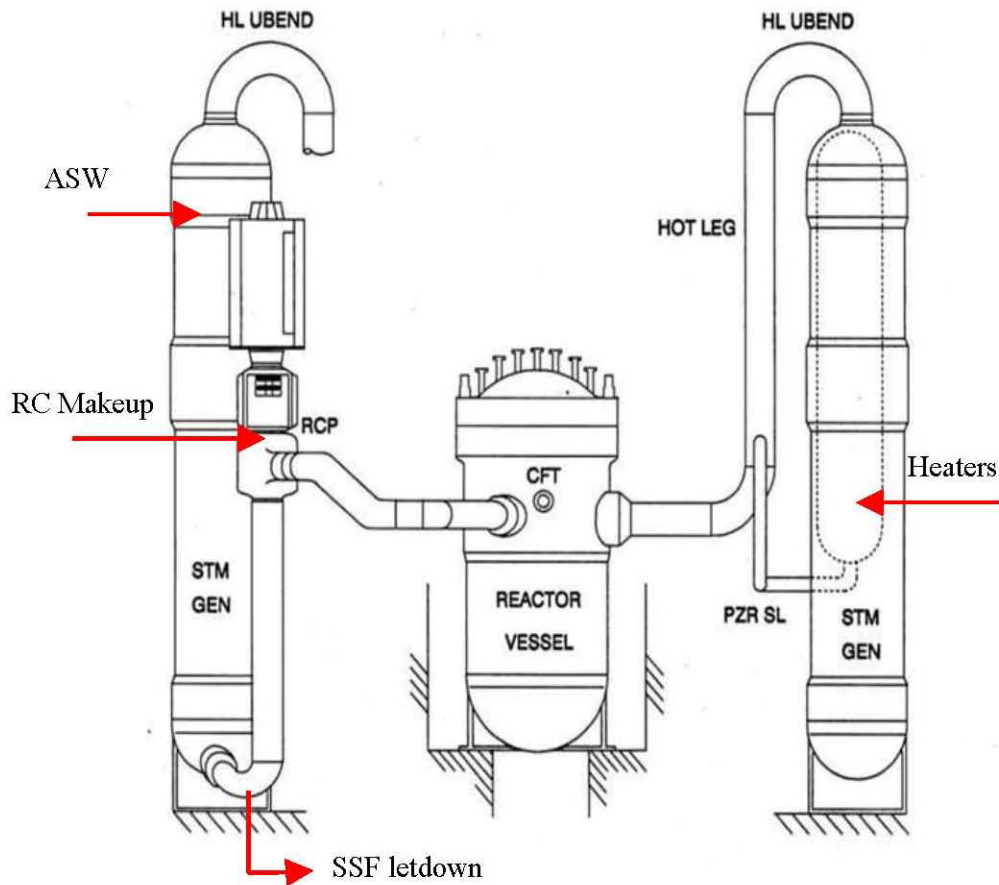
- Applications for six new AP1000 reactors at three sites

- 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?