



2006
Preliminary Reliability Study Results

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Preliminary Reliability Study Results

Reliability Study process - Two Parts

- **Part 1. Base Reliability Plan**
Evaluate the transmission system's ability to meet load growth with existing resource plans.
- **Part 2. Resource Supply Scenarios**
Evaluate transmission system impacts for various resource supply options to meet future native load requirements.



Preliminary Reliability Study Results

- First studies of the year using updated cases
 - Provided a new opportunity to assess current transmission plans under the combined Duke and Progress detailed model
- Duke and Progress performed the screening analysis
- All analyses and assessments are coordinated
 - Combined detailed model
 - Tested impact of system transmission and generation outages on one system impacting the other system
 - Improved generation dispatch assumptions
- Results are shared with all Participants



Preliminary Reliability Study Results

Part 1. Base Reliability Plan

- Nothing unexpected or imminent was found
- Timing of some projects will be adjusted
- Projects address future transmission reliability issues up through the 2016 planning horizon



Preliminary Reliability Study Results

Progress Energy - Base Reliability Plan

- Will establish one new project
- Will delay one project
- Three planned projects addressing local load serving issues will be monitored for timing



Preliminary Reliability Study Results

Progress Energy - Base Reliability Plan

- Falls 230/115 kV Transformer
 - Issue was revealed in earlier PEC studies
 - Establish a new project to install a second transformer in about 2013



Preliminary Reliability Study Results

Progress Energy - Base Reliability Plan

- Laurinburg 230/115 kV Transformers
 - Reduced loading on these facilities
 - One year delay (from 2012 to 2013) of a current project to replace existing transformers with higher MVA transformers



Preliminary Reliability Study Results

Progress Energy - Base Reliability Plan

- Richmond – Newport 500 kV Line
 - Study confirms Progress import limitations
 - Richmond - Newport line becomes an issue before the end of the 2016 planning horizon with planned resources



Preliminary Reliability Study Results

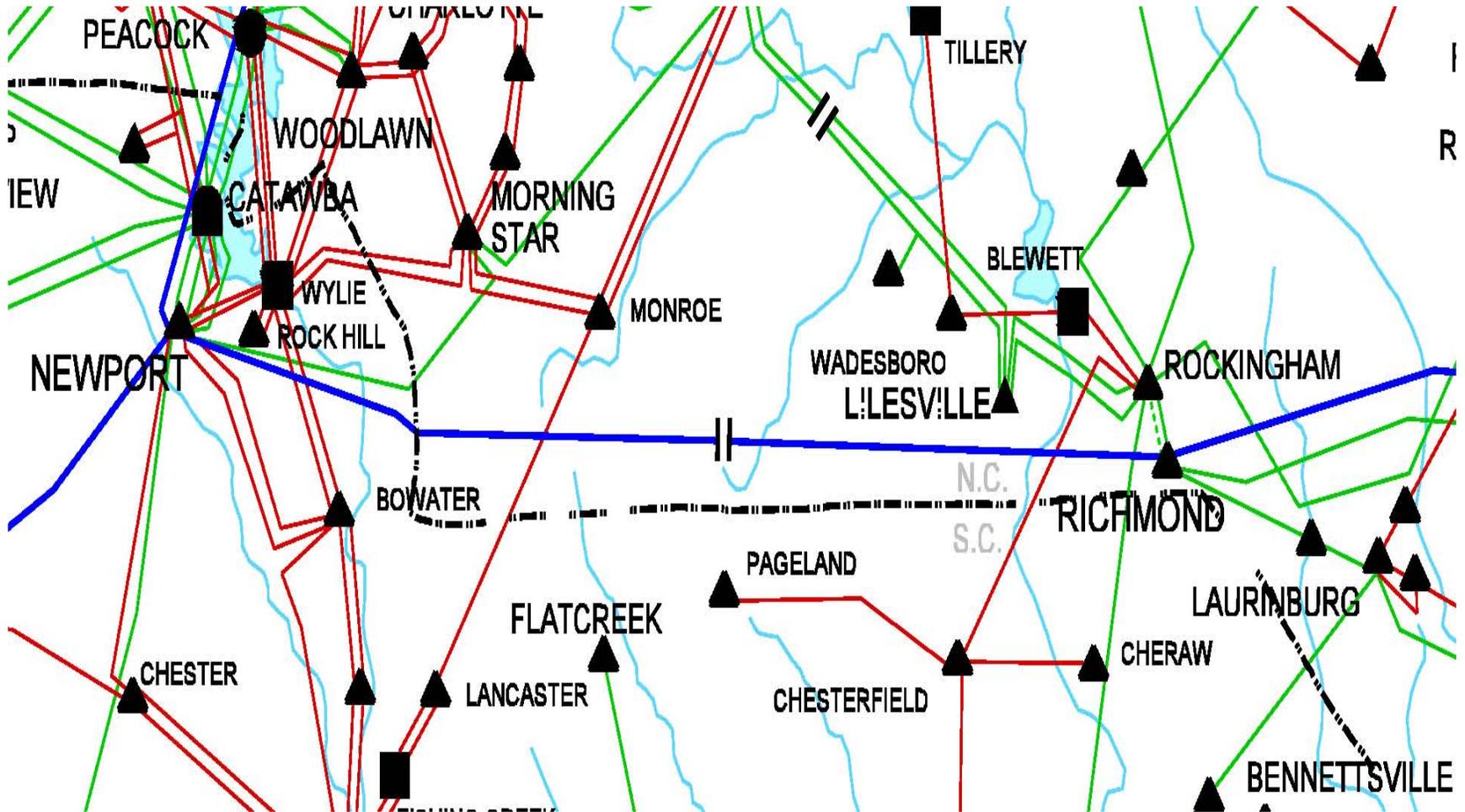
Progress Energy - Base Reliability Plan

➤ Richmond – Newport 500 kV Line

- PWG brainstormed solutions
 - Switching reactor;
 - New 500/230 kV station between Newport and Richmond;
 - Thyristor Controlled Series Compensator;
 - Shunt Static VAR Compensator (SVC) midway between Newport and Richmond; and
 - New 500 kV lines.



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Preliminary Reliability Study Results

Progress Energy - Consultant Study

- Richmond – Newport 500 kV Line
 - Engineering consultant was hired by Progress to assist in the evaluation of technical options
 - Progress completed a Phase I feasibility study
 - Several options evaluated
 - Static solutions
 - FACTS solutions
 - Operating procedures
 - Thyristor Controlled Series Compensator most promising solution at this time
 - Phase II study underway



Preliminary Reliability Study Results

Duke Energy - Base Reliability Plan

- No new transmission facility additions were identified by the study
- Three projects previously identified continue to be monitored (2011 and beyond) for adjustments to the timing of the projects



Preliminary Reliability Study Results

Duke Energy - Base Reliability Plan

- London Creek 230 kV Line
(Riverview – Peach Valley 230 kV Line)
 - Internal screens indicate that bundling of this line will be required in the 2012 timeframe.
 - The PWG study indicates upgrade will be necessary around 2016.
 - The timing is impacted by south-to-north flow across the Duke control area.



Preliminary Reliability Study Results

Duke Energy - Base Reliability Plan

- Antioch 500/230 kV Transformer Banks (2)
 - Internal Duke screens and PWG study both indicate additional transformer capacity needed around 2014.
 - Increased imports from the north accelerates timing.
 - Increased imports from the south delays project.
 - Location of additional generation resources can significantly impact bank loading.



Preliminary Reliability Study Results

Duke Energy - Base Reliability Plan

- Parkwood 500/230 kV Transformer Banks (2)
 - Internal screens show the need for additional transformer capacity around 2019 to 2022.
 - PWG study indicates 2015 in the base screen.
 - Added outage of a large Progress Energy - Roxboro unit shows need for project advancement of 3-4 years to 2012.



Status of Activities

Part 1. Base Reliability Plan

- All transmission study analysis for the Base Reliability Plan has been completed
 - Results confirm and validate that the prior Progress Energy and Duke Energy transmission plans maintain future system reliability
 - No surprises, nothing unexpected, nothing imminent
 - Timing adjustments may be required



Preliminary Reliability Study Results

Part 2. Resource Supply Scenarios

- Participant Scenarios provided from...
 - NCMIPA1, NCEMPA, Fayetteville Public Works Commission, NCEMC, Waynesville, Tri-Towns, Forest City/Dallas, Concord
- Results will provide information to complement LSE planning related to future resource supply needs
- Transmission service via OASIS must still be requested and obtained



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List of Resource Supply Scenarios for Study

Resource From	Sink	Sink	Net Requests	Test Level
NORTH - PJM (AEP)	Duke		473	600
WEST - TVA	Duke		464	600
SOUTH - SOCO	Duke		564	600
SOUTH - SCEG	Duke		464	600
SOUTH - SC	Duke		464	600
EAST - Progress	Duke		464	600
NORTH - PJM (AEP)		Progress	535	600
NORTH - PJM (VP)		Progress	535	600
SOUTH - SCEG		Progress	600	600
SOUTH - SC		Progress	500	600
WEST - DUKE		Progress	500	600 *
NORTH - PJM (AEP/AEP)	Duke	Progress	1,008	600 / 600
NORTH - PJM (AEP/VP)	Duke	Progress	1,008	600 / 600
NORTH - PJM (AEP)		Progress	20	20

* Additional Duke to Progress Test Level of 1200 MW was added on August 15, 2006



Resource Supply Findings

Imports into Progress Energy

- Need to address 500 kV phase angle issue
- Common thermal issues for imports from NORTH (PJM/AEP/VP), SOUTH (SC or SCE&G), and WEST (Duke)¹
 - Overload Wake 500/230 kV banks
 - Overload 230 kV lines in Durham/Cary area
 - Increased 500kV & 230kV line flows from the south
 - Overload 230 kV lines in the Rockingham/Cape Fear area
 - Overload lines in the Asheboro/Biscoe area
- Resolution needed in 2011/2012 timeframe

¹ Progress imports from the WEST will affect timing of Duke's Parkwood 500/230 kV transformer upgrades



Resource Supply Findings

Import Limitations into Duke Energy from the NORTH from PJM (AEP)

- Duke will continue to monitor the timing of the future transformer upgrades at the Antioch substation.
- Transformer replacement schedule would be advanced from 2014 if higher imports from the North occur.



Resource Supply Findings

Import Limitations into Duke Energy from the WEST from TVA

- Planning model included an upgrade to the Nantahala-Robbinsville-Santeetlah 161 kV tie line and increased capacity to 596 MVA .
- No thermal limits were identified at the levels tested.



Resource Supply Findings

Import Limitations into Duke Energy from the SOUTH from SC, SCEG or SOCO and into Duke Energy from the EAST from Progress

- No thermal limits were identified at the levels tested.



Status of Activities

Part 2. Resource Supply Scenarios

- Problem identification analysis for the list of resource supply scenarios has been completed by both Progress Energy and Duke Energy
- One additional supply scenario has recently been added - Duke to Progress Test Level at 1200 MW
- Evaluation and development of potential solutions for the various resource supply scenarios is continuing - results by end of year



**Questions?
or
Comments**