



**Supplemental
Report on the
NCTPC
2006
Collaborative
Transmission
Plan**

04/26/07

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Appendix 1: Updated Collaborative Transmission Plan Major Project Listing

Appendix 2: New and Modified Major Project Descriptions

Appendix 3: Projects Investigated for Duke to Progress East Resource Supply Options Studied

I. Executive Summary

The report documenting the 2006 North Carolina Transmission Planning Collaborative (“NCTPC”) Transmission Plan was published in January 2007. That report, which was the first single Collaborative Transmission Plan for the Participants in North Carolina, included study results and potential solutions for 600 MW transfers into Duke Energy Carolinas (“Duke”) and/or Progress Energy Carolinas, Inc. (“Progress”) from various source areas. In August 2006, one additional resource supply scenario study was added to evaluate a 1,200 MW import from Duke to Progress East. The purpose of this supplemental report to the 2006 Collaborative Transmission Plan is two-fold:

- 1) to report on results of additional analyses performed to study a transfer of 1,200 MW from Duke to Progress East; and
- 2) to update the preferred solutions presented in the Collaborative Transmission Plan based on additional analysis performed over the last two months.

The Planning Working Group (“PWG”) developed a number of potential alternatives to solve problems identified in the 1,200 MW import case from Duke to Progress East. These potential alternatives were simulated in:

- the base reliability case;
- the 600 MW import case from Duke to Progress East; and
- the 1,200 MW import case from Duke to Progress East.

As a result of the analysis, the PWG identified and the Oversight Steering Committee (“OSC”) approved a preferred solution that modifies the 2006 Collaborative Transmission Plan as follows:

- Added project:
 - Pleasant Garden to Asheboro 230 kV line, including replacing the Asheboro 230/115 kV transformers.
- Modified project:
 - Harris to Durham 230 kV line has been modified in the Plan. The Harris to RTP 230 kV section of the line is included in the Plan. However, the RTP to Durham 230 kV section of the line is deferred, since this section of the line is not needed within the 10 year planning horizon.
- Deferred projects:
 - Third Wake 500/230 kV transformer has been deferred beyond the 10 year planning horizon.
 - The Cape Fear to Siler City 230 kV line has been deferred beyond the 10 year planning horizon.
- Deleted project:
 - Buck to Asheboro 230 kV line has been removed from the Plan.

- Advanced project:
 - Antioch 500/230 kV transformer capacity addition has been advanced by one year.

The updated major project listing (costs greater than \$10M) for the 2006 Collaborative Transmission Plan reflecting these modifications is identified in Appendix 1 of this report. Detailed project descriptions for the new and modified major projects are listed in Appendix 2.

II. Introduction

The report documenting the first single Collaborative Transmission Plan for the Participants in North Carolina was published in January 2007. The report included results from the base reliability analysis as well as analysis of potential resource supply options. The resource supply analysis included evaluating independently an import of 600 MW:

- from each neighboring Control Area into Duke and/or Progress East;
- from Duke into Progress East; and
- from Progress East into Duke.

In August 2006, one additional resource supply scenario study was added to evaluate a 1,200 MW import case from Duke to Progress East. The results of the analysis of this 1,200 MW import case are provided in this supplemental report on the 2006 Collaborative Transmission Plan.

III.1,200 MW Resource Supply Option Study – Increased Imports from Duke to Progress East

III.A. Case Development

Using the 2011 resource supply option case with a 600 MW import from Duke to Progress East, the PWG created a 1,200 MW import case from Duke to Progress East. The 1,200 MW import represents the following resource supply options from Duke into Progress East:

- 500 MW for Fayetteville;
- 400 MW for Progress; and
- 200 MW for NCEMC.

A 100 MW redirect OASIS request by NCEMC for changing the source from AEP to Duke was also added to the models thus creating a 1,200 MW Duke to Progress East import case.

III.B. Assessment, Problem Identification and Solution Development

The PWG performed an assessment of the 1,200 MW Duke to Progress import case in accordance with the methodology and criteria discussed in

Section III of the Report on the NCTPC 2006 Collaborative Transmission Plan. The reliability problems resulting from their assessments of this resource supply option scenario were documented and discussed among the PWG.

The PWG developed the potential alternatives, listed in Table 1, to solve the problems identified in the analysis of the 1,200 MW Duke to Progress import case. These potential alternatives were simulated in:

- the base reliability case;
- the 600 MW import case from Duke to Progress East; and
- the 1,200 MW import case from Duke to Progress East.

Duke and Progress developed rough planning cost estimates and construction schedules for the alternatives.

**Table 1
Potential Alternatives**

Alternative	Description
1	Parkwood to Durham 500 kV line Pleasant Garden to Asheboro 230 kV line
2	Harris to Durham 230 kV line Buck to Asheboro 230 kV line
3	Harris to Durham 230 kV line Pleasant Garden to Asheboro 230 kV line
4	Bynum 500 kV substation Harris to RTP 230 kV line
5	Bynum 500 kV substation Harris to RTP 230 kV line Parkwood to Durham 500 kV line
6	Harris to RTP 230 kV line Pleasant Garden to Asheboro 230 kV line

III.C. Selection of Preferred Reliability Solutions

Using the results of the analysis described in Section III.B., the PWG compared the potential alternatives and selected the preferred solution, balancing cost, benefit and risk. The PWG identified the following preferred solution for both the 600 MW and the 1,200 MW Duke to Progress East resource supply option scenarios:

- Adding the Harris to RTP 230 kV line; and
- Adding the Pleasant Garden to Asheboro 230 kV line, including replacing the Asheboro 230/115 kV transformers

Implementation of this solution:

- Defers the need for:

- the third Wake 500/230 kV transformer beyond the 10 year planning horizon;
 - the RTP to Durham 230 kV line section of the Harris to Durham 230 kV line beyond the 10 year planning horizon; and
 - the Cape Fear to Siler City 230 kV line beyond the 10 year planning horizon.
- Deletes the need for:
 - the Buck to Asheboro 230 kV line.
 - Advances the need for:
 - Additional 500/230 kV transformer capacity at the Pleasant Garden 500 kV Substation to within the 10 year planning horizon.

These deferred and deleted projects were previously identified in Appendix B and D to the Report on the NCTPC 2006 Collaborative Transmission Plan.

The issues identified and preferred solutions investigated for the 600 MW and 1,200 MW import cases from Duke to Progress East are listed in Appendix 3. The table in Appendix 3 is intended to give an estimate of the cost and schedule impact in order to accommodate a new request to increase imports into Progress East from Duke by 600 MW and by 1,200 MW in 2011. The cost estimates provided reflect either the total cost of new projects needed solely for the import or the acceleration of an existing project already identified. The need date and lead time determine the estimated year the request could be accommodated.

A notable difference in the preferred solutions based on this supplemental analysis relative to the preferred solutions presented in the original report is the addition of a Pleasant Garden to Asheboro 230 kV line instead of a Buck to Asheboro 230 kV line. The Pleasant Garden alternative reduces loadings on impacted facilities to a greater degree than did the Buck alternative. Additional reduction in flows results on the Progress East interface with Duke in the Durham, Rockingham, and Richmond areas and with the Yadkin interface at Badin. Internally, contingency loadings are lower on the Tillery/Biscoe/Asheboro corridor as well as in the Raleigh/Durham area.

A significant factor in this change to the Pleasant Garden alternative is in the implementation schedule. Pleasant Garden is a more feasible solution in the time frame under study due to its proximity to the Asheboro 230 kV Substation. Pleasant Garden is approximately 20 miles from Asheboro versus Buck which is approximately 40 miles from Asheboro. Still with a lead time of 5 years, achieving a 2011 in-service date for the Pleasant Garden to Asheboro 230 kV line could present a significant implementation challenge.

IV. Updated 2006 Collaborative Transmission Plan

Once the reliability and all of the resource supply options studies had been completed as part of the 2006 Study, the PWG re-evaluated the results to determine if any modifications should be incorporated into the 2006 Collaborative Transmission Plan.

Examination of the 1,200 MW resource supply option provided the PWG an opportunity to further refine the original 2006 Collaborative Transmission Plan. Specifically, the PWG identified that a Pleasant Garden to Asheboro 230 kV line was a preferred solution over the previously identified Buck to Asheboro 230 kV line for 2011 resource supply options for 600 MW and 1,200 MW imports. Additionally, this project could also replace Buck as a project for 2014 to address reliability issues in the Collaborative Transmission Plan. However, another significant benefit identified with the Pleasant Garden to Asheboro 230 kV line solution is its benefit to Asheboro area voltage. Progress has an existing project scheduled to address Asheboro area contingency voltage issues earlier than 2011; specifically, the Cape Fear to Siler City 230 kV line is scheduled for 2010 (Project # 0006 in the original 2006 Collaborative Transmission Plan). Since the Pleasant Garden to Asheboro 230kV line is approximately the same cost and has additional benefits beyond those of the Cape Fear to Siler City 230 kV project, the Pleasant Garden to Asheboro 230 kV line is recommended to replace the Cape Fear to Siler City 230 kV line and therefore has been added to the revised Collaborative Transmission Plan with an in-service date of 2011 versus 2014.

The PWG recommended and the OSC approved the following modifications to the 2006 Collaborative Transmission Plan that were identified from the supplemental resource supply option studies documented in this report. The updated set of new projects added to the Plan were not identified in the base reliability studies; however, based on the additional analysis performed by the PWG, the new projects will have positive financial benefits and will address issues more effectively than the original 2006 Collaborative Transmission Plan. The projects will also be beneficial toward creating additional import capability as identified in the resource supply option studies. A summary of the changes to the original 2006 Collaborative Transmission Plan is listed below:

The addition of:

- Harris to RTP 230 kV line; and
- Pleasant Garden to Asheboro 230 kV line, including replacing the Asheboro 230/115 kV transformers.

Addition of these new projects to the Plan,

- Defers the need for:
 - the third Wake 500/230 kV transformer beyond the 10 year planning horizon;
 - the RTP to Durham 230 kV line section of the Harris to Durham 230 kV line beyond the 10 year planning horizon; and
 - the Cape Fear to Siler City 230 kV line beyond the 10 year planning horizon.

- Deletes the need for:
 - the Buck to Asheboro 230 kV line.
- Advances the need for:
 - the Antioch 500/230 kV transformer capacity addition by one year.

The updated 2006 Collaborative Transmission Plan is comprised of 14 major projects with an estimated cost of \$10 million or more each. These projects are listed in Appendix 1. The list will continue to be modified on an ongoing basis as new improvements are identified through the NCTPC Process and projects are completed or eliminated from the list. The list provides the following information for each project:

- 1) Reliability Project: Description of the project.
- 2) Issue Resolved: Specific driver for project.
- 3) Status: Status of development of the project as described below:
 - a. *Underway* – Projects with this status range from the Transmission Owner having some money in its current year budget for the project to the Transmission Owner having completed some construction activities for the project.
 - b. *Planned* – Projects with this status do not have money in the Transmission Owner’s current year budget; and the project is subject to change.
- 4) Transmission Owner: Responsible equipment owner designated to design and implement the project.
- 5) Planned In-Service Date: The date the project is expected to be placed in service.
- 6) Estimated Cost: Best estimate of the cost available. The estimate accuracy may vary dependent on the maturity of the project.
- 7) Estimated Time to Complete: Number of years needed to complete project.

A detailed description of the major projects which are either new or modified, based on this supplemental analysis and report, is provided in Appendix 2.