

# North Carolina Transmission Planning Collaborative Process

## Overview

The purpose of the North Carolina Transmission Planning Collaborative (NCTPC) Process is more fully described in the Participation Agreement. In general, however, the NCTPC Process was established to:

- 1) provide the Participants (Duke Energy Carolinas, LLC (Duke), Progress Energy Carolinas, Inc. (Progress), North Carolina Electric Membership Corporation and Electricities of North Carolina) and other interested parties an opportunity to participate in the electric transmission planning process for the areas of North Carolina and South Carolina served by the Participants,
- 2) preserve the integrity of the current reliability and least-cost planning processes,
- 3) expand the transmission planning process to include analysis of increasing transmission access to supply resources inside and outside the control areas of Duke and Progress,
- 4) expand the transmission planning process to include analysis of increasing the transmission capability to provide for transactions that go through or out of Duke's and/or Progress' control areas to an external control area, and
- 5) develop a single coordinated transmission plan for the areas of North Carolina and South Carolina served by the Participants that includes reliability and enhanced transmission access considerations while appropriately balancing costs, benefits and risks associated with the use of transmission, generation, and demand-side resources.

The overall NCTPC Process includes the Reliability Planning and Enhanced Transmission Access Planning (ETAP) Processes, whose studies will be concurrent and iterative in nature. The general scope of these studies is outlined in the attached Appendix. It is expected that there will be considerable feedback and iteration between the two processes as each effort's solution alternatives affect the other's solutions.

The Oversight Steering Committee (OSC) will manage the NCTPC Process. The Planning Working Group (PWG) will support the development of the NCTPC Process and coordinate the study development. The Transmission Advisory Group (TAG) provides a structure whereby interested parties can participate in the NCTPC process. The scope documents of the OSC, PWG and TAG more fully describe the roles and responsibilities of each of these groups

Figure 1 below illustrates the major steps associated with the NCTPC Process.

## Reliability Planning Process

The Reliability Planning Process is the transmission planning process that has traditionally been used by the transmission owners to provide safe and reliable transmission service at the lowest reasonable cost. This transmission planning process is being expanded to include the active participation of the NCTPC Participants and input from interested parties through the TAG.

The Reliability Planning Process will follow the steps outlined in Figure 1. The OSC will approve the scope of the reliability study, oversee the study analysis being performed by the PWG, evaluate the study results, and approve the final reliability study results. The PWG will coordinate the development of the reliability studies based upon the OSC-approved scope and prepare a report with the recommended transmission reliability solutions. The TAG participates in the Reliability Planning Process by providing timely input on the annual study scope elements associated with the development of the reliability transmission planning process as outlined in the TAG annual work plan.

The final results of the Reliability Planning Process will include summaries of the estimated costs and schedules to provide any transmission upgrades and/or additions needed to maintain a sufficient level of reliability necessary to serve the native load of all Participants. The reliability study results will be reviewed with the TAG. The TAG members are responsible for providing feedback to the OSC on the results.

## Enhanced Transmission Access Planning Process

The ETAP Process will evaluate the means to increase transmission access to potential LSE network resources inside and outside the control areas of Duke and Progress as well as evaluate the means to increase transmission capability to provide for transactions that go through, in, or out of Duke and/or Progress.

The ETAP Process will follow the steps outlined in Figure 1. The ETAP Process will begin with the TAG participants proposing scenarios and interfaces to be studied. The proposed scenarios and interfaces will be compiled by the PWG. The PWG will determine if it would be efficient to combine and/or cluster any of the proposed scenarios and will also determine if any of the proposed scenarios are of an inter-regional nature. The OSC will review the PWG analysis, approve the compiled study list, and provide the study list to the TAG. The OSC will direct the TAG participants to submit the inter-regional study requests to the Southeast Inter-Regional Participation Process since those studies would have to be evaluated within that forum.

For the remaining study scenarios that impact the NCTPC region, the TAG Voting Members will select a maximum of five scenarios that will be studied within the current NCTPC planning cycle. TAG Voting Members will be permitted to cast one vote for a maximum of five study scenarios. There may be multiple representatives of TAG Voting Members; however, for voting purposes, each TAG Voting Member can only submit one vote. The top five study scenarios that receive the majority number of votes will be the study scenarios that are selected to be studied within the current NCTPC planning cycle. To be able to vote, the TAG Voting Member must participate in the meeting, either by

being physically present at the meeting or through participation by phone. There will be no charge to the TAG Voting Members for the five studies selected. However, if a particular TAG participant wants the NCTPC to evaluate a scenario that was not chosen by the TAG Voting Members, then that participant's organization can request to have the NCTPC conduct the study. The NCTPC will evaluate this request and will conduct the study if the study can be reasonably accommodated, however the cost of conducting this additional study will be allocated to that specific organization.

The ETAP would include, if requested, the evaluation of Regional Economic Transmission Paths (RETPs) that would facilitate potential regional point-to-point economic transactions, including point-to-point transactions that support the designation of network resources. If the TAG Voting Members request an Initial RETP Study, once that Initial RETP Study is complete, a determination would be made as to whether there is sufficient interest in the project to move the RETP from the "initial study" mode to the establishment of an "Open Season" for the RETP. The Open Season will provide the structure whereby Duke and Progress will be able to process these RETP Point-to Point Transmission Service requests for the entire proposed MW of the RETP from the source control area to the sink control area for the relevant time period. During this Open Season all potential transmission customers would have a 60-day window to put in their request to subscribe to all or a portion of the MW of service being made available along the RETP. RETPs are described in more detail in the document entitled *NCTPC Transmission Cost Allocation*.

The OSC will establish the annual scope of the ETAP study based upon the scenarios selected by the TAG Voting Members (including any changes in the assumptions and study criteria for the studies used in the reliability analysis), oversee the study analysis being coordinated by the PWG, evaluate the study results, and approve the final ETAP study results. The PWG will coordinate the development of the enhanced transmission access studies and prepare a report which will identify recommended transmission solutions that could increase transmission access. The TAG participates in the ETAP Process by providing timely input on the annual study scope elements associated with the development of the economic transmission planning process as outlined in the TAG annual work plan.

The final results of the ETAP Process will include the estimated costs and schedules to provide the increased transmission capabilities. The enhanced transmission access study results will be reviewed with the TAG. The TAG members are responsible for providing feedback to the OSC on the results.

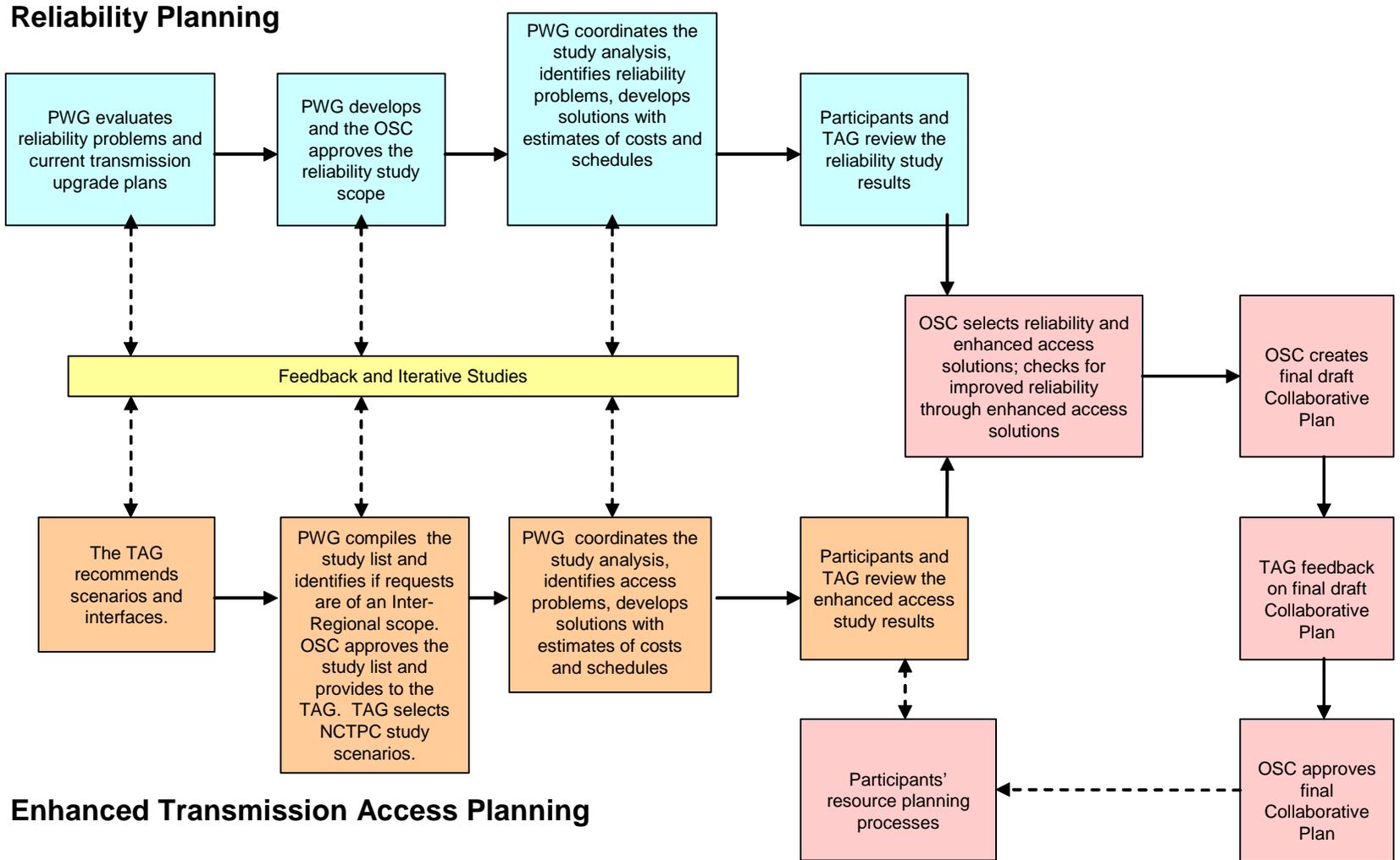
## Collaborative Transmission Plan

Once the reliability and ETAP studies are completed, the OSC will evaluate the results and the PWG recommendations to determine if any proposed enhanced transmission access projects, other than RETPs, will be implemented. If so, the initial reliability study will be modified accordingly. As to RETPs, the Open Season determines whether the RETP will move forward. If the RETP is fully subscribed, it would move forward to a Facilities Study stage. After such stage, if it remained fully subscribed, the RETP would

be included in the Collaborative Transmission Plan and Service Agreements will be executed (or filed on an unexecuted basis). This process will result in a single Collaborative Transmission Plan being developed that appropriately balances the costs, benefits and risks associated with the use of transmission and generation resources. The final plan will be reviewed with the TAG.

The Collaborative Transmission Plan information will be available for NCTPC Participants to identify any alternative least cost resources to include with their respective Integrated Resource Plans. Other interested parties can similarly use the information provided within this process to support their business interests.

**Figure 1**  
**North Carolina Transmission Planning Collaborative**  
**Process Flowchart**



## Appendix

# North Carolina Transmission Planning Collaborative Process

## Transmission Planning Study Process - General Scope

The scope of the study processes for both the Reliability Planning and the Enhanced Transmission Access Planning activities are very similar and share many of the same steps such as assumptions, study criteria, methodology, etc.

The typical study process includes the following steps:

### 1. Assumptions

- Select the study assumptions for the analysis
- The study assumptions normally include the following:
  - Years to study
  - Load levels to be studied (e.g., peak, shoulder and light loads)
  - Load forecasts
  - Resource supply projections
  - Interchange capabilities
  - Firm reservations including TRM / CBM
  - Transmission contingencies
  - Special protection schemes, special operating schemes
  - Financial (e.g., time value of money, financing costs, duration of analysis for present value analyses, etc.)

### 2. Study Criteria

- Establish the criteria by which the study results will be measured
- The criteria should promote consistency in the planning criteria used by all Participants, while allowing for circumstances that are unique to individual systems
- Typical study criteria involve the following elements:
  - NERC reliability standards
  - SERC Requirements
  - Individual company criteria (voltage, thermal, stability, short circuit, and phase angle)

### 3. Case Development

- Prepare the base case model
- Develop change case models as required to evaluate different resource supply scenarios

### 4. Methodology

- Determine the methodologies that will be used to carry out the study
- Determine the specific software programs that will be utilized to perform the analysis

### 5. Technical Analysis and Study Results

- Perform the study analysis (thermal, voltage, stability and short circuit) and produce the results
  - Study thermal and voltage limits first thermal limits are typically the most difficult to resolve and the most limiting, with voltage issues usually being identified within the same power-flow analyses
  - Study stability and short circuit analysis as needed

### 6. Assessment and Problem Identification

- Evaluate the results to identify problems / issues. The key questions are:
  - What causes the issues / limits?
  - If the limit were removed or increased, what would the next limit be and what would limit it?

### 7. Solution Development

- Identify potential solutions to the problems / issues
- Test the effectiveness of the potential solutions through additional studies (thermal, voltage, stability, short circuit) and modify the solutions as necessary such that all study criteria are met
- Perform financial analysis and rough scheduling estimation for each of the proposed transmission solutions (e.g., cost, cash flow, present value)

### 8. Selection of Preferred Transmission Plan

- Compare alternatives and select the preferred solution alternatives – balancing of cost / benefit / risk

- Select a preferred set of transmission improvements that provides the most reliable and cost effective transmission solution while prudently managing the associated risks

## 9. Report on the Study Results

- Prepare a report on the results and recommended solutions for the final plan