

2008-2009 SIRPP Study Scope Document – revised based on 3/09 Stakeholder Call input

Purpose of Study

The purpose of this study is to assess the performance of the transmission systems of the Participating Transmission Owners for the five Economic Planning Studies as identified by the Stakeholders. This assessment will include the identification of upgrades to accommodate the power flows of the five Economic Planning Studies. Planning staff of the Participating Transmission Owners will perform the studies. The study results will be reviewed with the Stakeholders for their input.

Overview of the Study Process Scope

The scope of the proposed study process will include the following steps:

1. Assumptions

- Study assumptions selected

2. Study Criteria

- Establish the criteria by which the study results will be measured

3. Case Development

- Develop the models needed to perform the study

4. Methodology

- Determine the methodologies that will be used to carry out the study

5. Technical Analysis and Study Results

- Perform the study analysis (thermal, voltage, stability and short circuit, as necessary for the study) and produce the results

6. Assessment and Problem Identification

- Evaluate the results to identify problems / issues

7. Solution Development

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

8. Report on the Study Results

- Prepare a report on the identified system limitations and potential transmission upgrades to accommodate the five Economic Planning Study requests.

Each of these study steps is described in more specific detail below.

Assumptions

The specific assumptions selected for this study are:

- The year to be studied (study year) will be 2014 Summer.
- The following scenarios will be studied:
 - Entergy to Georgia ITS = 2000 MW
 - PJM West to Southern = 2000 MW
 - Southern to PJM classic (Non AEP/ComEd part of PJM) = 3000 MW
 - PJM classic to Southern = 3000 MW
 - SPP to Southern = 5000 MW
- For each of the five scenarios studied, the study will be performed in such a way that it identifies the system limitations and potential transmission upgrades needed on the collective SIRPP systems to accommodate the requested economic transfer. The analysis will be a flow-based analysis and not a contract path based analysis. For example, on the PJM Classic to Southern = 3000 MW scenario, the study will simulate a 3000 generation increase in PJM Classic and a 3000 MW generation decrease in Southern. The study will determine:
 - How the 3000 MW of power flow distributes across the system (i.e., how much flows through TVA, through Duke, through Entergy, through systems outside of SIRPP, etc.
 - What are the limitations/associated upgrades identified on the SIRPP systems.
 - Identify total system losses and individual system losses for systems which >10% of the transfer flows through the individual system
 - General/approximate timelines for major system improvements
- For each of the five scenarios, a Step 1 evaluation will be performed. A Step 1 evaluation will consist of a high level screen of the requested transfer. The high level screen will identify transfer constraints and likely transmission enhancements to resolve the identified constraints. The Step 1 evaluation will report out on elements of 161 kV and higher; where warranted by the transmission owner, elements operating at lower voltage levels may be reported. The Participating Transmission Owners will also provide approximate costs and timelines associated with the identified transmission enhancements to facilitate the stakeholders' determination of whether they have sufficient interest to pursue a Step 2 evaluation. PSS/E and/or MUST will be used for the study.
- Generation, interchange and other assumptions will be coordinated between Participating Transmission Owners and Stakeholders.

Study Criteria

The study criteria with which results will be evaluated will include the following reliability elements:

- NERC Reliability Standards
- SERC requirements
- Individual company criteria (voltage, thermal, stability, short circuit and phase angle)

Case Development

- The 2008 MMWG cases will be used for systems external to the systems of the Participating Transmission Owners as a starting point for the analysis, “All Firm Transmission”, confirmed long term firm transmission reservations with roll-over rights, will be included.
- To perform the study for each of the five requested scenarios, two cases will be built a Case A which is the starting base case with no transfer modeled, and then a Case B, which is the Case A modified to represent the specific transfer being studied.
- In developing the study models, the Participating Transmission Owners will coordinate to ensure that they have consistent assumption regarding any planned upgrades on their respective systems.
- Each individual Transmission Owner will then modify the two cases to reflect their internal assumptions (e.g., Partial Paths, CBM, TRM) and perform their analysis considering only events at 161 kV and higher.

Methodology

- Initially, power flow analyses will be performed based on the assumption that thermal limits will be the controlling limit for assessing system reliability. Voltage, stability, short circuit and phase angle studies may be performed if circumstances warrant.
- The Participating Transmission Owners will exchange contingency and monitored element files so that each can test the impact of the other company’s contingencies on its transmission system.

Technical Analysis and Study Results

The technical analysis will be performed in accordance with the study methodology. Results from the technical analysis will be reported throughout the study area to identify transmission elements approaching their limits such that all Participating Transmission

Owners and Stakeholders are aware of potential issues and appropriate steps can be identified to correct these issues, including the potential of identifying previously undetected problems.

Each Participating Transmission Owner will analyze power flows throughout the study area based on the following criteria:

Transmission Owners will capture as supporting documentation

- Thermal loadings greater than 85% in Case A
- Thermal loading in transfer cases greater than 90%

Transmission Owners will report

- Thermal loadings in transfer cases greater than 100% that increase by 5% or more of applicable rating in the transfer cases.
- Thermal loadings in transfer cases greater than 90% but less than 100% that increase by 5% or more of applicable rating from Case A.
- Identification of needed improvements to address overloads of 100% or greater.
- Reporting out on elements on 161 kV and greater; where warranted by the transmission owner, elements operating at lower voltage levels may be reported.
- Voltages appropriate to each Participating Transmission Owner's planning criteria

Assessment and Problem Identification

- Each Participating Transmission Owner will run their respective assessments. Each Participating Transmission Owner will use their respective reliability criteria for its facilities. Each Participating Transmission Owner will document the reliability problems resulting from their assessments.

Solution Development

- The Participating Transmission Owners, with input from the Stakeholders, will develop potential solution alternatives to the identified reliability problems.
- The Participating Transmission Owners will test the effectiveness of the potential solution alternatives using the same cases, methodologies, assumptions and criteria described above.
- The Participating Transmission Owners will develop rough, planning-level cost estimates and construction schedules for the selected solution alternatives.

Report on the Study Results

The Participating Transmission Owners will compile all the study results and prepare a report for review by the Stakeholders. The report shall contain the following:

- A description of the study approach and key assumptions for the five Economic Planning Studies
- For each Economic Planning Studies, the results of that study including:
 1. Limits to the transfer
 2. Selected solution alternatives to address the limit
 3. Rough, planning-level cost estimates and construction schedules for the selected solution alternatives