

Northern Tier Transmission Group – 2008-09 Study Plan

Study Plan Development

From the Northern Tier Transmission Group's Planning Committee Charter:

Quarter 2: Study plan development and assumptions – The identification of the loads, resources, transmission requests, desired flows, constraints, etc. to be included and monitored during the study period. The methodology, criteria, assumptions, databases, and identification of the analysis tools will be established and posted for comment and direction by stakeholders and Planning Committee members.

Objectives of the Study

From the Northern Tier Transmission Group's Planning Committee Charter:

The planning group will biennially prepare a long-term (10 year) bulk transmission expansion plan, while taking into consideration up to a twenty year planning horizon. The plan will provide strategic transmission options (economic and reliability projects) and specific alternative plans for reinforcing the transmission system. The plan is also intended to help coordinate the integration of new generation into the system and to reduce transmission congestion. The work is intended to be completed primarily by the transmission owners in the footprint utilities with input from all interested stakeholders.

Specifically, the comprehensive transmission plan and/or planning process will:

1. Identify transmission needs of transmission customers (e.g., point-to-point, network, and retail native load), as they are identified and provided to the transmission provider. The transmission provider shall consolidate this information for their respective system to include in the sub-regional planning process.
 - a. Native load needs will be incorporated by input from the various integrated resource planning (IRP) processes where they exist. Network transmission customers will be asked to submit information on their projected loads and resources on a comparable basis (e.g., planning horizon and format). The intent will be to plan for all end-use loads on a comparable basis.
 - b. Each transmission provider's existing point-to-point customers will be asked to submit any projections they have of a need for service over the planning horizon and at what receipt and delivery points.
2. Identify transmission congestion that is an impediment to the efficient operation of electricity markets. Congestion on the existing and planned system will be reviewed and evaluated. In addition, the impacts on congestion of potential new generation facilities or new transmission projects will be considered. This will include production simulation studies on a sub-regional and regional level, and historical use analysis as provided by the Northern Tier Use Committee and TEPPC subcommittees.
3. Work with TEPPC to include the needs of other sub-regions and support WECC transmission planning.

The objective of the 2008 Northern Tier transmission study effort is to perform a Conceptual Study that determines, given a limited number of forecasted and assumed load and resource portfolios, which of the sub-region's set of proposed transmission additions are required to provide a feasible system operation at forecasted stress times, ten years in the future.

In 2009, additional analyses will be undertaken, in accordance with processes specified in the member transmission providers' Attachment Ks and in the Northern Tier Transmission Group Planning Committee Charter.

These analyses will contribute to a more refined plan, which will be prepared, discussed and approved by the end of 2009.

Selected Principles from the Northern Tier Transmission Group Planning Committee Charter:

1. **Coordination** – Coordinate between the entities developing the transmission system, including the regulatory community, and the entities that utilize and benefit from the transmission system. It will be the responsibility of the project participants to determine the specifics of a project such as the scope of the project, lead entity or entities, project participants, and funding.
3. **Transparency** – Provide a forum for transmission owners and operators to clearly disclose the criteria, assumptions, and data that underlie their transmission system plans.
7. **Regional Participation** – This committee will coordinate its efforts with other sub-regional planning groups and WECC planning committees.
11. **Collaboration with Regulators** – Transmission plans will be developed in close collaboration with regulators to facilitate the implementation of energy policy, information sharing, and enhance and streamline project permitting, financing and construction.
12. **Avoid Duplication** – NTTG will perform technical study work that is not duplicative of work done by others and will rely as much as possible on the technical studies conducted by Transmission Providers, project sponsors, and studies conducted in other forums.
13. **Share Workload** – Members of NTTG will share the study work. In general, members will study the areas where they have an interest. The results of the individual work will be shared with NTTG.

Confidentiality

The studies to be undertaken in developing the draft transmission plan will employ and report on data that have been classified by their providers as Critical Energy Infrastructure Information, Confidential Transmission Information, or Proprietary Market Information. Care will be taken to protect such data from unauthorized disclosure.

Any document or file containing confidential information will be marked with its type(s) of confidential contents.

An effort will be made to maximize declassified communication by avoiding the inclusion of small amounts of classified data and by, where practical, separating documents into classified and unclassified portions (such as an unclassified report with some classified attachments).

Stakeholders may have access to classified information in accordance with tariffs and regulatory filings delimiting such access and establishing the required non-disclosure agreements.

General Schedule and Deliverables

The broad timing of the transmission plan development process and the work products to be delivered are presented in the NTTG Planning Committee Charter.

Quarters 3 and 4: Draft plan analysis – The modeling of the system loads, resources, improvements, etc. to be considered. Technical screening studies using power flow analysis will be used to evaluate preliminary feasibility of and reliability of the system. Addition or modification of transmission elements considering past economic studies, and to meet performance and study criteria established in the study plan will be identified, resulting in a draft transmission plan for public and stakeholder comment.

Quarter 5: Draft study results

Quarter 6: Economic studies

Quarter 7: Final plan report

Quarter 8: Final plan approved by NTTG Steering Committee

Methodology

1. Time Frame
 - a. 10 years in the future
 - i. From the NTTG Planning Committee Charter (Comprehensive Transmission Plan):

The planning group will biennially prepare a long-term (10 year) bulk transmission expansion plan, while taking into consideration up to a twenty year planning horizon.
 - ii. From PacifiCorp's Attachment K at 2.1.1 (local planning process):

.... The Transmission System Plan shall study a ten (10) year planning horizon.
 - iii. From Idaho Power's Attachment K at 2.1 (preparation of a local transmission plan):

.... The Local Transmission Plan shall study a twenty (20) year planning horizon.
 - b. One-hour focus

NTTG studies will examine the adequacy of the Western Interconnection using techniques consistent with established planning methods, focused on anticipated times

of system stress. System stress will be analyzed using integrated one-hour loads and resources for periods representing appropriate seasons and times of day.

2. System Conditions to Study

Northern Tier Transmission Group studies will examine the efficacy of alternative transmission expansion scenarios against defined load and resource scenarios at times of system stress ten years in the future. The year 2018 will be the focus of the studies. Based on experience, historical practice, and qualitative assessment of conditions in 2018, each of the four seasons will be reviewed to determine whether it should be included in the NTTG 2008 Draft Transmission Plan

- a. Heavy Winter: The Pacific Northwest and parts of the Inland Northwest experience their annual maximum one-hour demands between December and February, principally due to high levels of electrical space heating. A normal winter peak, consistent with that developed at the Western Electricity Coordinating Council, will be considered.
- b. Heavy Summer: Annual maximum one-hour demands for other portions of the WECC occur during the summer months of June to August, principally due to high levels of air conditioning and other cooling. A normal summer peak, consistent with that developed at the WECC, will be assessed.
- c. Light Spring: With forecasts calling for the construction of substantial resources in the Inland Northwest – well in excess of local demands – significant transmission will be required to move power to other demand centers. This need is exacerbated by the lack of correlation between wind generation and local demand patterns, and the presence of large amounts of base-load, or flat-loaded, thermal generation. Consequently, the greatest need for inter-regional transmission may occur at times when local load is at its minimum. Therefore, cases examining off-peak or low-demand hours must be considered. One such case is light spring, when annual loads are generally at their minimums and, due to implications of snowpack runoff and spring rains, hydrogeneration assumes a much-changed pattern, resulting in considerable uncertainty about transmission adequacy.
- d. Light Autumn: As with light spring, light autumn demands also create a situation where inter-regional transmission may be strongly taxed. While demands may be somewhat higher than in the spring, hydrogeneration tends to move to its lowest levels at a season of low precipitation and exhausted snow-packs.

3. Bases Cases Selected

To perform the necessary studies in a timely fashion and consistent with Planning Principles cited above, Base Cases will be selected from those made available by the Western Electricity Coordinating Council in its Library filed under Base Cases and will be consistent with those used by the entities performing the studies in their local transmission planning.

4. Contingencies to be Run

The contingencies evaluated by the entities performing studies will be consistent with those examined in their local planning studies, and generally include the following steps:

- a. Perform power flow adequacy runs, analyzing at N-0 (without outages), tuning to meet voltage loading requirements.
- b. No stability studies will be run in the course of these conceptual analyses.
- c. Use automatic load tap changer movement and capacitor switching (if enabled by their controls), then manual manipulation.
- d. Examine single-contingency (N-1) transformer and line contingencies and common-mode outages defined in the contingency list developed by modelers as part of creating the Work Plan.

Criteria

The viability of power flow studies will be determined in accordance with WECC and NERC criteria.

The primary metric for power flow success is service of all demand in the Northern Tier Transmission Group footprint and export of a substantial portion of sub-regional surplus generation.

Assumptions

The study will incorporate the loads, resources and transmission submitted in the Quarter 1 data request. Analysts will determine the assignment of data to multiple scenarios as appropriate.

Databases

The primary source of power flow study data will be the Western Electricity Coordinating Council, which makes such data available in formats familiar to those performing power flow studies in the Western Interconnection. Modifications made to the WECC Base Cases will be collected and shared in formats familiar to and agreed to by the persons running the studies.

Analysis Tools

Studies used in the development of the NTTG 2008 Draft Transmission Plan will employ power flow analysis models mutually agree upon and compatible with those used by the participants performing the studies at the NTTG member utilities.

Power flow modeling alternatives are General Electric's PSLF model, PTI's PSSSE model, and PowerWorld's simulator programs. It is expected that analysts will prefer to use their standard in-house models and convert data as necessary among them, rather than to use common data files and undertake the use of an unfamiliar model.

Loads

Loads in the selected WECC Base Cases will be modified to reflect the data submitted in the Quarter 1 data collection process and the forecasts produced by Transmission Providers as part of their Integrated Resource Planning or, where no IRP is done, official load forecasts used in other published planning processes.

Resources

Resources established in the selected WECC Base Cases will be modified to reflect the data submitted in the Quarter 1 data collection process. Data will be examined to eliminate duplication or differences in size, location, or characteristics. Data will be coordinated and agreed among the study analysts and, upon proper protection via aggregation or other appropriate obfuscation, reviewed and agreed to by stakeholders.

Transmission Requests

Loads and resources and transmission additions not submitted as part of the Quarter 1 data collection process and not otherwise part of the WECC Base Cases and Transmission Provider modifications to those base cases will not be considered in this transmission plan.

Desired Flows

The path flows, load levels and relevant resource levels from the WECC Base Cases used will be considered in the Work Plan as loads and resources are modified to accommodate Northern Tier data submittals and as scenario details are established. Desired flows on relevant paths will be estimated and targeted in producing studies.

Constraints

Path constraints will be observed when developing the stressed seasonal cases. Newly-defined paths resulting from the addition, modification or up-rating of transmission facilities will be kept within their projected Operating Transfer Capabilities.

Northern Tier Transmission Group Transmission Plan – Report Outline

This is an outline of the 2008 Draft Transmission Plan and the 2009 Transmission Plan to be produced by the Northern Tier Transmission Group, indicating the general content and scope of the plans. Due to the nature of biennial planning as established in Attachments K to the Transmission Providers' Open Access Transmission Tariffs and in the Northern Tier Transmission Group's Planning Committee Charter, the 2009 Transmission Plan will be more expansive than the 2008 Draft Transmission Plan.

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