Northwest Power and Conservation Council

May 31, 2007

MEMORANDUM

TO: Power Committee

FROM: Wally Gibson

SUBJECT: Reviews of WECC Transmission Planning and Adequacy Activities and FERC Transmission Funding Decision

I will present a high level overview of the current status of transmission planning in WECC, including the relationship of WECC activities, subregional planning groups like ColumbiaGrid, NTAC and NTTG, and the requirements on transmission providers under the recently issued Order 890.

I will also describe briefly another recent FERC order that will substantially improve the ability of renewable resource developers to get transmission built from their resource areas to connect with the main grid.

Both reviews are contained in a background paper in the Power Committee packet for the conference call and webcast Thursday afternoon, June 6.

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Steve Crow
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

Background Paper

WECC Transmission Planning and Resource Adequacy Activities

FERC Order on Renewables Integration Transmission Funding

INTRODUCTION

This paper will describe transmission planning and resource adequacy activities in WECC to provide a description of the context in which the parallel Northwest activities take place. The Council staff is actively involved in both of these activities. It will also describe an important recent FERC decision on the funding of transmission lines that can make it easier for renewable energy developers to get transmission constructed in the future.

WECC TRANSMISSION PLANNING ACTIVITIES

Planning by transmission providers takes place in a three-level context. The most detailed level is each transmission provider's own planning. While strict reliability planning is governed primarily by its own and WECC standards, planning for providing additional load service requests and generation interconnection is governed largely by the provider's Open Access Transmission Tariff (OATT). This is a pro-forma document required to be filed by FERC, both directly for jurisdictional IOUs and indirectly for other, non-jurisdictional transmission providers (like Bonneville) who are subject to reciprocity provisions in order to get comparable transmission access. The pro-forma OATT has recently been significantly revised by FERC, in Order 890, to explicitly require more openness, transparency and regional coordination by transmission providers, among other things.

FERC issued this order on February 15, 2007 and the date for full compliance with the planning provisions is not until October of this year. The process described in this section is still under development, with a FERC technical conference devoted primarily to the Northwest occurring on June 13. The WECC-wide planning described below is also in the middle of development, with the first full report not due until next February.

The second level of the three-level context is subregional[1] planning, like that carried out by the Northwest Transmission Assessment Committee (NTAC), ColumbiaGrid, and Northern Tier Transmission Group (NTTG) in the Northwest. The subregional efforts in the West are expected to provide the primary locus for the regional planning coordination called for in Order 890 and required under the OATT.

The widest level is the planning that is going on under the auspices of the WECC Transmission Expansion Planning Policy Committee (TEPPC). TEPPC is a board committee with designated members representing a broad cross section of interests in regional transmission planning. The Technical Advisory Committee (TAS) is an open-membership committee that provides support to TEPPC. The TEPPC framework and study plan have been in development since last fall and

[1] Currently WECC usage has WECC as a "region" and the Northwest, for example, as a "subregion."

this year's studies, to be performed later this summer and this fall, will be the first in the TEPPC study cycle.

The TEPPC studies will look at the entire interconnection, though without capturing all local area problems and details, unless they are relevant to path ratings and overall congestion patterns. The aim of the westwide studies is to identify wide-scale congestion problems and solutions that would be raised by different patterns of resource development across the West. They will highlight opportunities for investment by transmission providers and other transmission developers. They are not intended to pick any one solution to a potential problem over another solution nor to propose or enforce cost allocations[2] (both are prohibited by the TEPPC charter).

The studies will be what are called "economic studies" that focus on transmission-constrained production cost modeling of the interconnection. They will capture the effects of transmission limitations or new construction on the generation cost incurred to meet loads in the West. They will not involve the kinds of detailed transmission reliability studies that need to be done later to support the investment in, rating of and operation of specific lines and facilities. They will, however, capture the results of that kind of study in the representation of the existing transmission system for the studies.

Order 890 requires the transmission providers annually to prepare studies of significant and recurring congestion, independent of specific requests for transmission service, and to provide for a limited number of studies requested by stakeholders to address congestion or the integration of new resources or load that are not simply requests for transmission service.

These studies, along with any specific service requests that cross provider boundaries will require regional and subregional coordination. The process currently being developed in the West is designed to address these needs. In addition to the three levels of study, it will involve mechanisms for parsing out study requests to the appropriate study level and for minimizing duplication of data provision and study effort.

The TEPPC studies will also provide a framework of data and results that can help support the more-detailed studies that will be done by the subregional groups and the individual transmission providers. A description of the TEPPC study process has been made available to be included in an attachment in western transmission providers' OATTs, as part of the demonstration to FERC that their transmission planning takes account of regional interests and issues.

TEPPC is also in charge of creating and maintaining a public data base for use in economic studies for western transmission planning. The data base will support the transmission constrained production cost modeling of the interconnection, which means that it will have both transmission and generation operating data for all the major transmission facilities and generators in WECC (approximately 2,200 generators, and over 14,000 buses and 18,000 transmission lines). This data base will be useful to the subregional groups as well as providing a publicly vetted source of data for other westwide modeling efforts, including the Council's.

[2] Processes to allocate costs are required of the individual transmission providers under their OATTs. Some subregional entities, such as NTTG, are developing a cost allocation process for their members.

WECC RESOURCE ADEQUACY ACTIVITIES

WECC provides a number of resource adequacy-related documents, including several that are submitted to the North American Electric Reliability Corporation (formerly Council, NERC), or provided as input to NERC reports.

As part of this reporting process, WECC uses reserve margins to test the adequacy of the system, given the loads and resources reported by the WECC member control areas. The WECC Load and Resource Subcommittee (LRS) is in charge of overseeing these reports and of developing the reserve margins to be used for the assessments.

It is important to highlight what these reserve margins represent and how they are used. First, the margins are only used for assessing the status of the interconnection and of its subregions; they are not required to be used by any load-serving entity or subregion to make resource decisions. Second, these margins are not intended to take the place of or override any metrics, targets, guidelines or standards that might be set by other entities, regulatory (like the California Public Utilities Commission's) or otherwise (like the Council's).

NERC, which sets reliability standards for the industry, has an adequacy standard in draft form that would apply to regional reliability organizations, like WECC, and would require them to have frameworks in place for assessing adequacy. WECC currently does have a framework in place and is in the process of improving its framework, the assessments and the metrics and targets that it uses for the assessments. NERC, in developing this standard, will be acting under provisions of EPAct 2005 that preclude its putting in place standards that require construction of generation or transmission to achieve resource adequacy.

Currently the WECC analysis only examines single hour capacity adequacy. While it recognizes that energy constraints are binding in the Northwest and could potentially impose problems in other subregions through, for example, air quality-related total emissions limitations, it has not done any analysis of these issues yet. One of the main LRS reports, the Power Supply Assessment (PSA), currently incorporates an appendix which describes the energy constraints in the Northwest, provided by the Council staff. There is an ongoing difficulty in modeling energy constraints, and particularly the hydro system operation, in the models used by WECC (and generally, outside of the Northwest), which has contributed to this problem.

LRS is proposing to its parent committee and then to the WECC Board that WECC adopt initial capacity guidelines to replace the guidelines that it has been using. These guidelines were developed as building blocks built up to cover several kinds of uncertainties. They are similar to the building blocks that were used to describe (but not to set the overall value for) the Northwest reserve margins. The overall Northwest margins were set using an LOLP analysis, which accounts for more uncertainties than just the specific building block elements themselves; the difference is captured in the element called "Planning Adjustment" when the total value is broken down into elements.

The proposed WECC values consist of the following specific elements:

- A contingency reserve, required of all Balancing Authorities[3] by WECC's Minimum Operating Reserve Criteria (MORC);
- A reserve for regulation, also required by MORC;
- A reserve for additional outages or outages that last more than one hour, since MORC requires any contingency reserve that is called upon because of an outage to be replaced in the operating hour following the contingency if the contingency continues; and
- A reserve to cover the effects on load of 1-in-10 temperature excursions (the basic forecasts against which the margin is applied use 1-in-2 temperatures).

Two of these are similar to components that are used to describe the Northwest reserve margin targets (the Northwest target does not explicitly call out regulation reserves and reserves for additional outages, the latter captured in part in the LOLP analysis). However, the Northwest temperature component covers 1-in-20 temperature effects rather than 1-in-10 effects.

The proposed WECC guidelines for the Northwest reporting region[4] are 16.4 percent in the winter and 13.8 percent in the summer. The pilot capacity standards for the Pacific Northwest, developed by the Resource Adequacy Forum and adopted by the Council are 25 percent in the winter and 19 percent in the summer.

The Northwest and WECC guidelines for the Northwest are not comparable for several reasons, however, though in general, the Northwest's standards are more stringent than WECC's for roughly similar areas. In addition to the difference in the temperature considerations and the use of an LOLP analysis in the Northwest, the loads and hydro resources are characterized differently. WECC's models are currently incapable of the sophisticated treatment of hydro operations and operational limitations that the Council's model incorporates. In addition, the Council's analysis looks at an average levels of load and hydro output over 10 hours per day for five days; WECC's looks at the single highest hour's load and hydro output.

Because of these current modeling limitations, the resource adequacy margins developed by WECC tend to be more useful is assessing adequacy in other subregions of the West than in ours. Council staff is involved in a effort, under TEPPC's TAS, to improve the hydro modeling capability of WECC's transmission planning model. This model could potentially be used in the future for assisting in or performing adequacy assessments as well. LRS will be looking into that possibility next year.

FERC RENEWABLE INTEGRATION TRANSMISSION FUNDING DECISION

FERC recently issued an order on a request by the California ISO to approve a new form of transmission line funding that would be appropriate for connecting a number of small, location-

[3] Balancing Authority is the new NERC term for the primary function performed by what used to be called Control Areas. The term stems from an effort to describe Control Area functions that can, in a non-vertically integrated utility world, be performed by different entities ('Authorities").
[4] This is a different subregion than the Northwest as we use the term and includes BPA, the Oregon and Washington utilities, and Northwestern Energy, but not Idaho Power.

constrained generating resources, such as in a wind resource area with several wind farms undergoing staged development. FERC gave the transmission lines to which this decision could apply the cumbersome title of "multi-user interconnection facilities" (multi-user facilities).

This is an important decision because the existing governing FERC tariffs and interconnection orders (designed with large generator interconnections in mind) only provide for the cost of the facilities providing interconnection to the main existing network being paid for completely by the generation developer. This worked when the interconnection facilities could be sized roughly to the size of the generator but did not work when the right size for the interconnections was significantly larger than any generator or portion of the generation under a single developer's control.

No individual generator or wind farm developer could afford, or get funding for, the transmission interconnection that would make sense, particularly for a large wind resource area. The transmission providers were constrained by previous FERC decisions in how they could charge for new facilities. The result was limited transmission development for new wind areas, despite their increasing prominence in IRPs and state renewable portfolio standards.

The new order provides that appropriately reviewed and approved interconnection facilities serving location-constrained energy resources can be built with each generator paying only its own pro rata share of the cost as it is interconnected. Any still-unsubscribed cost would be rolled into the network rates of the transmission provider and paid by all of the existing network transmission customers. That latter portion would decline as additional generators connected to the new multi-user facility and started picking up their own going forward pro rata shares of the cost.

WECC Transmission Planning and Resource Adequacy Activities

Northwest Power and Conservation Council

Power Committee

June 7, 2007

Northwest Power and Conservation Council

Overview

- Information for background only, no decisions
- Review of western transmission planning activities (not including reliability planning)
  - Three level planning framework – several new pieces
    - Individual transmission providers acting under FERC tariff
    - Subregional Planning Groups (SPGs)
    - WECC Transmission Expansion Policy Planning Committee (TEPPC)
- WECC resource adequacy activities
- FERC recent order on funding large-scale renewable interconnection facilities

Transmission Planning and Individual Providers

- Individual transmission provider acting largely under Open Access Transmission Tariff (OATT) – required by FERC
- Recently revised in Order 890 to require more openness, transparency and regional coordination in planning
- Regional coordination mostly through subregional groups and WECC, especially required economic and congestion studies
  - Studies of impact of transmission system changes on generation operating costs, focused on larger resource-development issues, not tied to specific service requests
- Order 890 allows stakeholders to request limited number of generic economic/congestion studies

Transmission Planning and Subregional Planning Groups

- Subregional planning groups
  - E.g., in the Northwest Power Pool area:
    - Northwest Transmission Assessment Committee (NTAC)
    - ColumbiaGrid
    - Northern Tier Transmission Group (NTTG)
- Expected to be the primary umbrella entities for detailed studies:
  - Addressing congestion and resource development issues
  - Leading to transmission investment decisions

Transmission Planning and WECC and TEPPC

- SPGs and other stakeholder groups have seats on TEPPC
- Interconnection-wide studies run by WECC staff
  - Wide-scale congestion problems and implications of west-wide patterns of resource development
  - Intended to highlight opportunities for investment
  - Not intended to pick winners or provide cost allocations
- Process to distribute study requests to appropriate level
- Framework of data and study results for subregional groups
- Public data base on generation and transmission for use by subregional groups, individual providers and others

WECC and Resource Adequacy – 1

- WECC provides a number of adequacy reports, including to NERC – reserve margins used to test adequacy
  - Not required to be used to make resource decisions
  - Not intended to take place of or override other state, subregional or other guidelines, targets or standards
  - NERC looking at new standards for regions (e.g., WECC) to do adequacy assessments
    - Cannot be used by NERC or WECC to require transmission or generation construction (EPAct 05)
- Currently, new margins being proposed for WECC

WECC and Resource Adequacy – 2

- Primary WECC report: Power Supply Assessment (PSA)
  - Limitations – single hour capacity analysis; no energy constraint, especially hydro, modeling capability; models by control area with major transmission connections
- New reserve margin calculation uses building block approach
  - Reserve for contingencies (in operating reserves)
  - Reserve for regulation (in operating reserves)
  - Reserves for additional outages
  - Reserves for 1-in-10 weather events
- NW adequacy guidelines calculated differently, using LOLP, and then described in building-block terms

WECC and Resource Adequacy – 3

- WECC targets for “NW area” (a different region)
  - Winter capacity: 16.4%
  - Summer capacity: 13.8%
- NW resource adequacy targets
  - Winter capacity: 25%
  - Summer capacity: 19%
- Differences – NW analysis is based on:
  - 1-in-20 weather, not 1-in-10
  - LOLP, a more comprehensive perspective
  - Uses different load and hydro resource characterization

FERC Funding Decision for Renewable Interconnections

- New policy on “multi-user interconnection facilities” to deal with funding issues for small location-constrained generation
- Funding problem originally created by FERC interconnection requirements, designed for large generators able to use most of a transmission line
  - Required cost of interconnection to be paid by generator
- New policy allows small generators to pay only own share as they connect, with network customers of provider paying for unsubscribed portion (declines as line is subscribed)
- Important decision for getting renewables like wind connected to the grid