

Available Transfer Capability (ATC) Methodologies for the Planning Time Period, Version 15

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1. Purpose

The Available Transfer Capability (ATC) methodologies set forth in this document are Transmission Services' methodologies for calculating ATC on the External Interconnections, Interties, Paths internal to BPA's Network (Network Paths) and Flowgates internal to BPA's Network (Network Flowgates) for the Planning Time Period (beyond 13 months). BPA's ATC Methodologies for the time horizon beginning with the current hour and extending through month 13 is provided in the ATC Implementation Document posted on Transmission Services' ATC Methodology website. Beyond month 13, the ATC methodology is determined in accordance to this document, except that Month 14 for the Network Flowgates is considered a transitional month between the 0 to 13 month time horizon and the Planning Time Period; therefore the methodology used to determine ATC for month 14 is the same methodology used for months 0 to 13.

2. Definitions

Unless otherwise defined herein, capitalized terms are defined in BPA's Open Access Transmission Tariff (OATT), Transmission & Ancillary Service Rate Schedules (Rate Schedules), the Business Practices, Federal Energy Regulatory Commission (FERC) Standards and Communication Protocols for OASIS, and/or the North American Electric Reliability Corporation (NERC) Glossary of Terms.

- 2.1 Evaluated Point-of-Delivery (POD)/Point-of-Receipt (POR): The POD(s) and/or POR(s) used to determine the impact of a LTF Request.
- 2.2 Original LTF Request: Initial request for reservation of LTF Transmission Service submitted on OASIS to Transmission Services.
- 2.3 Planning Time Period: The time horizon beyond 13 months.
- 2.4 Requested POD/POR: The Source/Sink provided in a LTF Request submitted on BPA's OASIS.

3. Introduction

- 3.1 BPA owns the Federal Columbia River Transmission System (FCRTS). Transmission Services provides Transmission Service over the FCRTS under its OATT and other, grandfathered contracts.
- 3.2 The FCRTS is used to deliver power between resources and Loads within the Pacific Northwest, and to transmit power between and among the Pacific Northwest region, western Canada and the Pacific Southwest.
- 3.3 The FCRTS is comprised of BPA's main grid network Facilities (Network) including constrained paths interconnecting with other Transmission Systems (External Interconnections¹), Interties², delivery Facilities, subgrid Facilities, and generation interconnection Facilities.

¹ Northern Intertie, Reno-Alturas Transmission System, West of Hatwai, West of Garrison and LaGrande Paths. West of Hatwai is treated as an External Interconnection because its operating characteristics are similar to an External Interconnection and this Flowgate has historically been treated as such.

4. ATC Methodology for the External Interconnections, Interties and Network Paths

The algorithm Transmission Services uses for its firm ATC determinations for Interties, External Interconnections, and Network Paths during the Planning Time Period is listed below, along with descriptions of each of the elements in the algorithm:

$$ATC_{Firm} = TTC - ETC_{Firm} - TRM$$

4.1 Total Transfer Capability (TTC)

Transmission Services calculates reliability-based TTCs for all Interties, External Interconnections, and Network Paths using powerflow and transient stability studies to establish a reliability limit. The TTC for each Intertie, External Interconnection, and Network Path represents the transfer capability of the BPA-owned Transmission lines and associated Facilities comprising such Intertie, External Interconnection, or Network Path. Transmission Services uses the WECC base cases to develop the seed cases that are used to simulate scenarios in order to determine a TTC that ensures all transmission elements do not exceed their continuous rating as well as satisfying all planning criteria contingencies. Topology changes from new or retired facilities as well as updated load forecast assumptions are incorporated into the TTC studies. Outages are considered in setting the TTC; although, Long-Term sales are made using the all lines in service TTC, unless it has been determined that TTC has been significantly reduced for specific months to accommodate long-term outages or upgrades.

4.2 Firm Existing Transmission Commitments (ETC_{Firm})

The algorithm Transmission Services uses for its firm ETC determinations for Interties, External Interconnections, and Network Paths during the Planning Time Period is listed below, along with descriptions of each of the elements in the algorithm:

$$ETC_{Firm} = NITS + PTP + ROFR + GF + OS$$

4.2.1 Network Integration Service (NITS)

Except for the following two netting adjustments, Transmission Services uses the full amount of its Network Integration Transmission (NT) load forecasts:

4.2.1.1 For West of Hatwai, must-run federal generation from the following eastside hydro resources: Dworshak, Hungry Horse, Libby, and Albeni Falls; is netted against Network Loads in that area to calculate ATC for West of Hatwai in the east to west direction.

4.2.1.2 For LaGrande, federal generation serving grandfathered and Network Loads in Southern Idaho is netted against peak loads in that area to calculate the ATC for LaGrande in the west-to-east direction.

4.2.2 Point-to-Point Service (PTP)

² Southern Intertie (AC Intertie and DC Intertie) and Montana Intertie.

Transmission Services uses the full amount of Point-to-Point Service amounts.

4.2.3 Right of First Refusal (ROFR)

Transmission Services assumes that a transmission customer with a transmission service contract containing the right of first refusal will take or continue to take transmission service when that contract expires or is eligible for renewal, unless otherwise notified by the transmission customer.

4.2.4 Grandfathered Contracts (GF)

Transmission Services includes amounts from the following grandfathered contracts: Integration of Resources (IR) and Formula Power Transmission Service (FPT).

4.2.5 Other Services (OS)

Transmission Services includes amounts from other firm service contracts including, but not limited to, the following: agreements where Transmission Services provides Transmission Service to Investor-Owned Utility Loads located in Transmission Services' Balancing Authority Area, obligations to the United States Bureau of Reclamation (USBR) to serve its irrigation pumping load, and the return of power under the Columbia River Treaty.

4.2.6 BPA does not include counterflows in the determination of ATC for External Interconnections, Interties and Network Paths.

4.3 Transmission Reliability Margin (TRM)

Transmission Services does not set aside transfer capability for TRM during the Planning Time Period.

5. ATC Methodology for Network Flowgates

The algorithm Transmission Services uses for its firm ATC determinations for Network Flowgates during the Planning Time Period is listed below, along with descriptions of each of the elements in the algorithm:

$$ATC_{\text{Firm}} = TTC - ETC_{\text{Firm}}$$

5.1 Total Transfer Capability (TTC)

Transmission Services calculates reliability-based TTCs for all Network Flowgates using powerflow and transient stability studies to establish a reliability limit. The TTC for each Network Flowgate represents the flowgate capability of the BPA-owned Transmission lines and associated Facilities comprising such Network Flowgate. Transmission Services uses the WECC base cases to develop the seed cases that are used to simulate scenarios in order to determine a TTC that ensures all transmission elements do not exceed their continuous rating as well as satisfying all planning criteria contingencies. Topology changes from new or retired facilities as well as updated load forecast assumptions are incorporated into the TTC studies. Outages are considered in setting the TTC for the Planning Time Period beyond 14 months although Long-Term sales are made using the all lines in service TTC, unless Planning has determined that TTC has been

- significantly reduced for specific months to accommodate long term outages or upgrades.
- 5.2 For Existing Transmission Commitments (ETC) calculations, Transmission Services models power flows representing various system conditions. Transmission Services uses subsequent power flow analysis to reflect new or changed system conditions.
- 5.2.1 The power flow model is a mathematical representation of the actual lines, transformers, loads, and generators that comprise the Federal Columbia River Transmission System. A key output of this model is a computation of how much power will flow over each element in the power system for the assumed load and generation levels.
- 5.2.2 Power flow analysis inherently includes counterflows, so the determination of ETC_{Firm} in the predominately constrained direction for each Network Flowgate is decreased by flows in the opposite direction.
- 5.2.3 At least once per calendar year, Transmission Services develops representative seasonal power flow cases for five and ten years out. This process is referred to as the ATC Base Case Update.
- 5.2.4 Loads are reflected in the model as follows:
- 5.2.4.1 Normal peak (1 in 2 year) non-coincidental load forecasts are used for all seasons in peak scenarios; and
- 5.2.4.2 Off peak loads are used for all seasons in light-load scenarios.
- 5.2.5 Non-Federal generation levels are initially set at:
- 5.2.5.1 The lower of contract demand or seasonal capability in peak scenarios; and
- 5.2.5.2 Historic levels in light-load scenarios.
- 5.2.6 The Columbia Generating Station (formerly known as WNP-2) is initially assumed to be on-line at full load in the power flow cases in all seasons. Transmission Services deems the portion of the plant's output that is not covered under federal Point-to-Point (PTP) contract demand to serve all contracts that call out non-specific Federal projects as Points of Receipt (PORs).
- 5.2.7 Transmission Services then sets initial generation levels at each of the Federal hydro projects³ by first determining the nameplate for each project and then adjusting such nameplates by outages forecasted for the particular plants. Next in the month of August, the Lower Snake plants (Lower Granite, Lower Monumental, Little Goose, and Ice Harbor) are capped at the observed project outflow over the past ten Augusts, including spill amounts. Generation levels at the Libby, Hungry Horse, Dworshak, and Albeni Falls projects, however, are set based on the requirements set forth in the 2000 Biological Opinion. In addition, the

³ Federal hydro projects include: Grand Coulee, Chief Joseph, Dworshak, Albeni Falls, Libby, Hungry Horse, Lower Granite, Lower Monumental, Little Goose, Ice Harbor, McNary, John Day, The Dalles, Bonneville, Willamette Valley Projects.

generation levels at the Willamette Valley projects are set at the minimum historical levels seen by season.

- 5.2.8 Transmission Services then models multiple scenarios.
- 5.2.8.1 Each of three different “zones” of Federal hydro resources is stressed to the generation levels described above and scales the generation at the remaining Federal hydro projects to match the sum of the demands for all contracts that call out non-specific Federal hydroelectric projects as PORs after adjusting these demands for the portion served by Columbia Generating Station, Libby, Hungry Horse, Dworshak, Albeni Falls, and the Willamette Valley projects. The Federal PTP demands at each project are then added to this result to obtain the final assumed generation level for each Federal hydro project. The overall method for modeling the federal resources is referred to as the “Nameplate Adjusted Method”.
- 5.2.8.2 The three “zones” that are stressed individually in the scenarios are made up of the following projects:
- (i) Upper Columbia zone: Grand Coulee and Chief Joseph;
 - (ii) Lower Snake zone: Lower Monumental, Lower Granite, Little Goose, and Ice Harbor; and
 - (iii) Lower Columbia zone: McNary, John Day, Dalles, and Bonneville.
- 5.2.8.3 Wind generators identified as PORs in PTP contracts and that require transmission service on the Federal transmission system are set at the greater of the following:
- (i) Modeled on at 100 percent of the contract demand for the wind generator; or
 - (ii) Modeled off and replaced by the “Balancing Logic Method” described in 5.2.8.6 below.
- 5.2.8.4 The Flowgate impact of wind generators identified as Designated Network Resources in NT contracts or in the NT Resources⁴ Memorandum of Agreement and that require Transmission Service on the Federal Transmission System are determined on a Flowgate by Flowgate basis, and set at the greater of the following:
- (i) Modeled on at 100 percent of the designated MW level for the wind generator; or
 - (ii) Modeled off and replaced, at 100 percent of the designated MW level for the wind generator, by “Nameplate Adjusted Method” Federal generators.
- 5.2.8.5 Return of power under the Columbia River Treaty is modeled at 100 percent of the treaty obligation and off.

⁴ Memorandum of Agreement, Management of Federal Power Sales for Network Integration Transmission Service, MOA.

- 5.2.8.6 If there is more generation than load in the power flow case after all exports and after all generation is modeled as described above, Transmission Services scales down the assumed generation levels to bring generation and Load into balance as follows:
- (i) In peak scenarios all generators are reduced *pro rata*, except for the stressed FCRPS zone, by the amount of excess generation; and
 - (ii) In off-peak scenarios, generation is reduced to reflect a merit-order dispatch, except for the stressed FCRPS zone⁵, which is modeled at forecasted light load hour outflow, including spill amounts.
- 5.2.9 A table documenting modeled generation levels is posted at the time of each ATC Base Case Update.
- 5.2.10 The lowest ETC amount for each season, resulting from the modeled scenarios, becomes the base ETC. These representative seasonal values are linearly interpolated to determine the ATC values for the time period two to ten years out.
- 5.2.11 Transmission Services then calculates an uncertainty margin that is the difference between the lowest ETC amount and the highest ETC amount resulting from the above described generation scenarios. This uncertainty margin is added to the base ETC to determine the ETC_{Firm}.

6. Management of ATC between Annual Planning Baseline Studies

- 6.1 Transmission Services will recompute the baseline ATC amounts for the Network Flowgates for the Planning Time Period at least once per year.
- 6.2 In the interim, Long-Term Firm Transmission Service Requests (TSRs) for new Transmission Service will be evaluated by determining the impact the new request has on each Network Flowgate per the Impacts of Long-Term Firm Requests and Accepted NT Resource Forecasts section below.
- 6.3 A Long-Term Firm TSR will be granted if there is:
- 6.3.1 Sufficient ATC at each Network Flowgate and sufficient ATC on all Paths for all time periods, including the Planning Time Period as adjusted for higher queued TSRs,
 - 6.3.2 Sufficient *de minimis* capacity on Network Flowgates if the TSR qualifies as having a *de minimis* impact on the Flowgate (See *De Minimis* on Transmission Services' ATC Methodology website for further details), and
 - 6.3.3 No reliability, subgrid, or local area issue(s) are identified.
- 6.4 Where there is insufficient ATC to grant a Long-Term Firm TSR or there are reliability, subgrid, or local area issues identified, System Impact or other Studies, as specified by the OATT, would be required.

⁵ The off-peak scenarios do not stress the Upper Columbia zone.

- 6.5 When a new TSR is granted or a Network Integration Transmission Service (NT) forecast is accepted, the final ATC for each Flowgate (except those with *de minimis* impact) will be decremented by the new transaction's impact on the Flowgate:

Final ATC = baseline ATC - sum of new transactions' impact on the Flowgate

- 6.6 When the next baseline ATC amounts are calculated, any new Long-Term Firm TSRs, including those with *de minimis* impacts, will be included in the calculation of ETC_{Firm} , except in the following cases:

- 6.6.1 Conditional Firm reservations;
- 6.6.2 Long-Term Firm TSRs whose service commencement date is later than the study time period; and
- 6.6.3 NT forecasts for which BPA is encumbering ATC using PTDfS.
- 6.6.4 The above impacts will continue to be reflected in the sum of the new transactions as described in section 6.5.

7. Impacts of LTF Requests and Accepted NT Resource Forecasts

LTF Requests for Transmission Service impacting Network Flowgates are analyzed using the following methodology:

- 7.1 PTDfS calculations are prepared for each LTF Request RECEIVED and for each LTF NT resource forecast accepted, to determine the impacts of the requested service on Network Flowgates, according to the following matrix:

	Request/Forecast Type	Evaluated POR	Evaluated POD
7.1.1	Original LTF PTP	Requested POR	Requested POD
7.1.2	NT (for service to New Network Load from a non-wind resource)	Requested POR	Requested POD
7.1.3	NT (for service to New Network Load from a wind resource) ⁶	(A) Requested POR	(A) Requested POD
		(X) FCRPS	(X) Requested POD
7.1.4	PTP Redirect ⁷	(A) Requested POR	(A) Requested POD
		(B) Existing POR	(B) Existing POD
7.1.5a	NT (for service to existing Network Load from a non-wind resource)	Requested POR	Displaced Designated Network Resource ⁸ or FCRPS
7.1.5b	NT (for service to existing Network Load from an existing non-wind designated Network Resource through a new Transfer POD on BPA's system)	Existing POD	Requested POD
7.1.6	NT (for service to existing Network Load from a wind resource or an NT forecasted resource) ⁹	(A) Requested POR	(A) Requested POD
		(B) Displaced Designated Network Resource ⁸ or FCRPS	(B) Requested POD
7.1.7	Deferral or Renewal Competition ⁷	(A) Challenger's Requested POR ¹⁰	(A) Challenger's Requested POD
		(B) Defender's Requested POR ¹⁰	(B) Defender's Requested POD

Notes:

⁶ The impact to each Flowgate is deemed to be the larger of either the Path (A) or Path (X) impacts.

⁷ Impacts of Path (B) are subtracted from the impacts of Path (A) = (A-B).

⁸ If no Displaced Designated Network Resource is identified in the customer comment field of the TSR, Transmission Services will assume FCRPS generation is being displaced.

⁹ The incremental impact to each Flowgate is the larger of either the Path (A) or Path (B) impacts minus the impacts of Path (B) = (A or B) - B = (A-B) or 0 MW, whichever is larger.

¹⁰ If the POR is associated with a wind resource designated as a Network Resource, the impact to each Flowgate is determined by using either the Requested POR or FCRPS, whichever results in the largest impact.

- 7.2 BPA further evaluates each LTF Request and NT forecast to determine whether the PTDF calculated impact is an appropriate reflection of the ATC impact anticipated if the TSR were CONFIRMED or the NT forecast accepted. If the PTDF impacts are not an appropriate reflection of anticipated impacts, BPA determines the impacts using studies, similar to those used to calculate ETC and/or TTC values.
- 7.3 When a Request is CONFIRMED or an NT forecast is accepted:
- 7.3.1 BPA decrements ATC to reflect either the non-*de minimis* positive PTDF calculation impacts or the anticipated impacts described in 7.2;
- 7.3.2 Any negative PTDF calculation impacts will be dealt with as follows:
- 7.3.2.1 The results of steps 7.1.1, 7.1.2, 7.1.3, and 7.1.6 will not be decremented to increase posted ATC values.
- 7.3.2.2 The results of steps 7.1.4, 7.1.5, and 7.1.7 will be decremented to increase posted ATC values.
- 7.3.3 Transmission Services will review the ATC impacts for requests authorized based on the results of a Cluster Study or a System Impact Study and determine how those impacts should affect posted ATC values. In doing so, Transmission Services will model those impacts in a consistent and non-discriminatory manner and post a notice on the ATC Methodology webpage at http://www.transmission.bpa.gov/business/atc_methodology/ explaining how it is modeling those impacts between base cases. Transmission Services will incorporate the impacts into the next base case update.
- 7.4 NT Requests for Generation Behind the Meter
- 7.4.1 Refer to the Generation Imbalance Service Business Practice for more information on generation behind the meter.
- 7.4.2 For generation of which all of the energy produced is dedicated to serving the Load Serving Entity's Load on the Load side of BPAT's POD meter and a NT Request is not required, the generation behind the meter is deemed to have no Network Flowgate impacts.
- 7.4.3 For generation of which only a portion of the energy produced is dedicated to serving the Load Serving Entity's Load on the Load side of BPAT's POD meter:
- 7.4.3.1 The NT Request for the portion of the energy produced that is dedicated to serve the Load Serving Entity's Load on the Load side of BPAT's POD meter will be deemed to have no Network Flowgate impacts.
- 7.4.3.2 The NT Request for the portion of the energy produced that is used for delivery outside of the Load Serving Entity's system and impacting Network Flowgates will be assessed using the relevant methodology in Step 7.1.
- 7.5 Evaluation of potential challengers for the demand capacity of Deferral and Renewal requests

- 7.5.1 PTDF calculations are prepared for each Deferral Request CONFIRMED and for each Renewal Request RECEIVED, to determine whether challengers for its demand capacity exist.
 - 7.5.1.1 The Deferral or Renewal Customer is hereafter referred to as the "Defender".
 - 7.5.1.2 The Customer that is determined to have a competing request is hereafter referred to as the "Challenger".
- 7.5.2 There must be sufficient ATC to accommodate the impacts determined in the PTDF calculations to conclude that the Challenger can be offered a Contingent Contract in a MW amount, including a partial offer that is at least equal to the amount of MWs that would be released by the Defender.
- 7.5.3 The Evaluated POD(s)/POR(s) used to prepare the PTDF calculation(s) will be determined based on Step 7.1.7.
- 7.5.4 If the LTF Renewal Request is CONFIRMED, there will be no change to posted ATC, as posted value reflects the assumption that roll-over rights will be exercised.
- 7.5.5 If the LTF Deferral Request remains CONFIRMED, there will be no change to posted ATC, except that ATC will be released for the period of the Deferral.
- 7.5.6 If the Challenger's Request is CONFIRMED, the positive PTDF calculation impacts will be decremented from ATC values; any negative impacts will also be decremented, to increase the posted values.