

Dynamic Transfer Operating and Scheduling Requirements

Version 5

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A. Introduction

1. The Dynamic Transfer Operating and Scheduling Business Practice combined two former business practices: the Dynamic Schedules Business Practice and the Remote Resources and Remote Loads Business Practice. Those business practices were consolidated into one business practice to update technical and operational requirements needed to effect Dynamic Transfers on Bonneville Power Administration's (BPA) system.
2. This business practice sets forth the technical and communication requirements for a Customer to use BPA's transmission system for Dynamic Transfers. Entities desiring to effect Dynamic Transfers on BPA's system must use firm transmission rights and must either (1) have had their use of Dynamic Transfer approved by BPA as of the date of this business practice or (2) request Dynamic Transfer Capability pursuant to the Requesting Dynamic Transfers - Pilot Business Practice or its successor.
3. This business practice may require some Customers to upgrade their telemetry for projects that are dynamically transferred. BPA understands that this may take Customers some time to accomplish. BPA will work with its Customers to help them comply with these requirements. BPA encourages Customers to contact their Account Executive if they have questions or concerns about how this business practice may impact them.
4. In addition to addressing Dynamic Transfers using BPA's transmission system, this business practice:
 - a. Governs Dynamic Transfers on BPA's share of the California-Oregon Intertie ("COI")

- b. Reflects certain common scheduling and operational provisions that currently agreed to by the other Transmission providers on COI. Any changes will be communicated in future updates.
 - c. Governs COI Dynamic Transfers for customers on BPA's system. BPA is also the Path Operator for the northern portion of the COI. As such, BPA performs certain activities for a COI transactions to maintain reliability (including managing dynamic signals within the delivery hour). However, Dynamic Transfers on other COI owners' systems are governed by each respective transmission provider's OATT and associated business practices. BPA coordinates Dynamic Transfers on the COI with the other owners of the COI facilities as Path Operator. Those facilities are owned jointly by BPA, Portland General Electric, and PacifiCorp.
5. A generator that is Dynamically Transferring its full output to a Balancing Authority or other controlling entity outside of the BPA Balancing Authority must do so using a Pseudo-Tie subject to the requirements of section J.

B. Eligibility Criteria

1. New requests for Dynamic Transfer on BPA's network are subject to BPA's Requesting Access to Dynamic Transfer Capability - Pilot business practice or its successor. Access to Dynamic Transfer Capability on the COI on BPA's system is governed by this business practice.
2. The Dynamic Transfer Entity must have executed a Dynamic Transfer Agreement, or equivalent agreement, and other agreements as appropriate, with BPA, prior to implementation of a Dynamic Transfer that involves the use of BPA's transmission system or the use of non-Federal transmission within BPA's Balancing Authority Area.
3. Each Balancing Authority involved in a Dynamic Transfer must have executed a Dynamic Transfer Operating Agreement, or equivalent agreement.
4. The Dynamic Transfer Entity may only effect Dynamic Transfers on BPA's transmission system with firm transmission rights.
5. The Dynamic Transfer Entity that requires a Dynamic Transfer shall be operating within a Balancing Authority Area recognized by the WECC.
6. The Dynamic Transfer Entity must coordinate with its Balancing Authority, BPA, and any other impacted Balancing Authorities to ensure that procedures are in place and appropriate agreements executed to facilitate the desired Dynamic Transfer.
7. The Dynamic Transfer Entity and all involved Balancing Authorities must comply with WECC and NERC (or successor organizations) standards and policies.

C. Telemetry

1. Telemetry requirements for implementation of a Dynamic Transfer into, out of, or through BPA's Balancing Authority Area are described below:
 - a. BPA must test and approve in advance all systems necessary, as determined by BPA, to effect a Dynamic Transfer for each Dynamic Transfer Entity that desires to engage in a Dynamic Transfer.
 - b. The Dynamic Transfer Entity will provide BPA a telemetry signal corresponding to each Dynamic Transfer e-Tag representing the Dynamic

Transfer. BPA will determine where the appropriate signal will emanate from. This is the Dynamic Transfer Request Signal.

- c. The Dynamic Transfer Request Signal will be updated at least once every four seconds and will conform to ICCP requirements, or equivalent requirements as determined by BPA, for data format, accuracy, and reliability consistent with BPA' AGC cycle time and anti-aliasing filtering.
- d. If the desired Dynamic Transfer sources or sinks in BPA's Balancing Authority Area, BPA will send a Dynamic Transfer Return Signal to the Dynamic Transfer Entity in response to the Dynamic Transfer Entity's Dynamic Transfer Request Signal described above. The Dynamic Transfer Return Signal will be based on the actual response to the Dynamic Transfer Entity's Dynamic Transfer Request Signal. The Dynamic Transfer Return Signal will be the official Dynamic Transfer.
- e. BPA will provide a Dynamic Transfer Limit Signal to the Dynamic Transfer Entity continuously in real-time. This Dynamic Transfer Limit Signal will indicate the maximum allowable Dynamic Transfer. The Dynamic Transfer Entity shall adhere to this Dynamic Transfer Limit Signal.
- f. If BPA's Balancing Authority Area is an intermediary Balancing Authority Area between the native and attaining Balancing Authorities (the native and attaining Balancing Authorities can be the same Balancing Authority or two different Balancing Authorities), the Dynamic Transfer Entity will arrange for either the native or attaining Balancing Authority to provide BPA with a real-time telemetry signal that represents the amount of power being Dynamically Transferred through BPA's Balancing Authority Area. This signal will be the official Dynamic Transfer and will conform to the same requirements described in step C.1.d above.
- g. Latency time is measured from the attaining Balancing Authority metering point to inclusion of the BPA Dynamic Transfer Return Signal in the same attaining Balancing Authority's ACE calculator and shall be no greater than 20 seconds.
- h. BPA will provide a Ramp Rate Limit Signal to the Dynamic Transfer Entity continuously in real-time, which indicates the maximum ramp rate in MW per minute allowed for the Dynamic Transfer. As described further in section K.1, BPA may reduce the allowable ramp rate to maintain system reliability. The Dynamic Transfer Entity shall adhere to this limit.
- i. If the Dynamic Transfer Request Signal emanates from a Balancing Authority Area other than BPA's Balancing Authority Area, that Balancing Authority Area shall provide to BPA, upon request, documentation showing in detail the method of anti-aliasing and frequency cutoff it will be using to implement a Dynamic Transfer Request Signal. As required in step B.3, the Dynamic Transfer Entity is responsible for ensuring the appropriate arrangements with the applicable Balancing Authority Area to comply with this requirement.
- j. If there is a communication failure such that one or more of the requirements in steps C.1.b-h is not met, the Dynamic Transfer Entity shall immediately contact BPA Dispatch. BPA shall hold the Dynamic Transfer Limit Signal(s) at the last good value until appropriate communication is restored.
- k. All costs incurred by BPA to install telemetry for a Dynamic Transfer will be the responsibility of the Dynamic Transfer Entity requesting such service.

Such costs may include, without limitation, cost of system studies performed to determine the transmission impacts of the requested Dynamic Transfer request, costs for labor, software for AGC, communication equipment, and costs to upgrade both the Dynamic Transfer Entity and BPA's facilities. The Dynamic Transfer Entity is responsible for ongoing maintenance costs of its own equipment. BPA Transmission Service will maintain its own equipment.

- I. If a Dynamic Transfer sources from multiple Points of Receipt (PORs) and/or sinks to multiple Points of Delivery (PODs), then BPA reserves the right to require the Dynamic Transfer Entity to provide a separate official Dynamic Transfer for each POR/POD combination. This applies to any Dynamic Transfer into, out of, or through the BPA Balancing Authority Area and is necessary so that BPA can determine the impact of the Dynamic Transfer on the FCRTS.

D. E-Tagging Dynamic Transfers

1. Each Dynamic Transfer shall be electronically e-tagged in accordance with current NERC and WECC requirements and related BPA procedures.
2. The Dynamic Transfer Entity must arrange with BPA to have Real Time Operations Dispatch and Scheduling system Accounts established for each Dynamic Transfer request. This must be arranged during a regular Business Day and be completed prior to the first WECC Preschedule period in which the Dynamic Transfer Entity expects to request Dynamic Transfer Capability.
3. The Transmission profile on the e-Tags will be used to determine the transmission demand set aside for a Dynamic Transfer. The dynamic capacity reserved shall be deemed as used.
4. The e-Tag requirements for a Dynamic Transfer are specified in BPA's Scheduling Transmission Service business practice, as may be replaced or revised, and must also include the following:
 - a. Transaction type "DYNAMIC" is required for Dynamic Schedules.
 - b. Transaction type "PSEUDO-TIE" is required for Pseudo-Tie transactions.
 - c. Expected average Energy Profile delivered during the hour.
 - d. Adjustment after the hour will use the integrated official Dynamic Transfer.
 - e. The Dynamic Transfer Entity responsible for tagging Dynamic Transfers must ensure the e-Tag is updated for the next scheduling hour and future hours when:
 - i. The average Energy Profile on the e-Tag deviates from the hourly average Energy Profile, as described in NERC Standard INT-004-2 (as may be replaced or modified);
 - ii. Requested by a Reliability Coordinator or BPA.
5. Real-time pro rata curtailments of transmission capacity that is being used to effect a Dynamic Transfer will be calculated based upon the actual Dynamic Transfer Return Signal at the time of the curtailment. The resulting Dynamic Transfer Capacity curtailment will be communicated via the Dynamic Transfer Limit Signal and via the revised e-Tag from BPA indicating the new maximum allowable Dynamic Transfer Capacity use.
6. If BPA limits the Dynamically Transferred electrical power injected by the Dynamic Transfer Entity at a particular POR, then the Dynamic Transfer Entity will reduce the generation of its resources sourcing the Dynamic Transfer at the

specific POR. The resulting change in the Dynamic Transfer Entity's official Dynamic Transfer will be used to assess the Dynamic Transfer Entity's compliance with the limit. Failure to comply with any Dynamic Transfer limit shall be subject to the Failure to Comply Penalty consistent with BPA's Failure to Comply Business Practice, as may be replaced or revised.

E. Transmission Requirements Using Federal Columbia River Transmission System (FCRTS) Capacity

1. If the Dynamic Transfer Entity is using FCRTS Reserved Capacity for Dynamic Transfers, the following transmission requirements shall apply:
 - a. The Dynamic Transfer Entity may allocate all or part of its reserved capacity to its allowed Dynamic Transfer amount.
 - b. The Dynamic Transfer Entity may allocate any remaining reserved capacity to standard (i.e. non-Dynamic Transfer) transmission usage.
 - c. The Dynamic Transfer Entity must have adequate reserved capacity in the Transmission Profile for the Dynamic Transfer.
 - d. Population of the Energy Profile shall occur electronically using the official Dynamic Transfer after the fact based on the integrated number within 15 minutes after the end of the hour.
 - e. Each Dynamic Transfer will be for only one direction over a path. The portion of reserved capacity that has been reserved for Dynamic Transfer purposes in the Transmission Profile cannot be redirected, resold, or reassigned.
 - f. All reserved capacity for a Dynamic Transfer in the Transmission Profile whether or not called on, will be included in the Dynamic Transfer Entity's usage for purposes of determining whether there has been an Unauthorized Increase.

F. Transmission Requirements Not Using Federal Columbia River Transmission System (FCRTS) Capacity

1. This section applies to any Dynamic Transfer Entity that wishes to effect a Dynamic Transfer in or through BPA's Balancing Authority Area on non-FCRTS transmission. The following transmission requirements shall apply:
 - a. The Dynamic Transfer Entity must demonstrate that it has firm transmission capacity across BPA's Balancing Authority Area or on a path where BPA is the path operator for its Dynamic Transfer by setting aside reserved capacity in the Transmission Profile for the non-FCRTS path used.
 - b. The official Dynamic Transfer integrated over the hour will be used for interchange accounting purposes.

G. Apportioning COI DTC among COI Owners

1. COI DTC, which is based on the Dynamic Transfer Limits established under Section J.10 below, will be apportioned to the COI facility owners in proportion to facility ownership share of total COI transmission capacity. The amount of COI DTC apportioned to the COI owners is based on respective southbound ownership interests.

2. BPA's share of COI DTC may be further apportioned among COI Capacity Owners, and BPA may modify this Business Practice as needed to reflect that process.
3. COI DTC use on each COI facility owner's system will be governed by each respective transmission provider's OATT and associated business practices.
4. If a COI facility owner (or its customers) does not allocate their full share of apportioned COI DTC to its customers, then any remaining COI DTC will be apportioned to the other COI facility owners based on their respective ownership interests.

H. Allocating COI DTC on BPA's System

1. BPA will allocate COI DTC on its system according to the methodology described in Appendix A.
2. Requests for COI DTC on BPA's system must comply with Section I in order to receive an allocation.

I. Scheduling Procedures for Dynamic Transfers using BPA's Share of COI

1. Dynamic Transfer Entities that want to use their firm Reserved Capacity for a Dynamic Transfer over the COI must follow the procedures described below:
 - a. The Dynamic Transfer Entity must submit a request for a COI Dynamic Schedule via e-Tag to BPA for each hour covered by the WECC Preschedule day before 08:00.00 PPT of the WECC Preschedule day.
 - b. The e-Tag must be in a Confirmed state by 08:00 PPT of the WECC Preschedule day to be considered for an allocation.
 - c. The Dynamic Schedule must include two tokens in the "MISC" field to receive an allocation:
 - i. "BPAT", as the DTC Provider;
 - ii. "DTC Requestor", being the Purchasing Selling Entity Code of the Dynamic Transfer Entity requesting DTC
 - d. BPA will perform the allocation described in Section H and Appendix A in Preschedule by 10:00:00 PPT of the WECC Preschedule day above for Dynamic Schedules from eligible Dynamic Transfer.
 - e. The amount of Dynamic Transfer capacity requested must be entered in the transmission profile of the e-Tag for each hour or the requested amount will be assumed zero, and the Dynamic Transfer Entity will not receive an allocation for that hour.
 - f. The maximum Dynamic Transfer capacity that a Dynamic Transfer Entity can request is limited to the lesser of:
 - i) The amount of Dynamic Transfer capacity the Dynamic Transfer Entity has been certified to schedule by the California Independent System Operator (CAISO) or other California Balancing Authority; or
 - ii) the total Dynamic Transfer capacity that BPA has allocated to the Dynamic Transfer Entity; or
 - iii) the capacity available for Dynamic Transfers on other paths that must also be used to effect a Dynamic Transfer on the COI; or

iv) the total Dynamic Transfer scheduling capability described in Section J.10; or

v) other factors limiting Dynamic Transfers.

- g. BPA will curtail the Dynamic Schedule to the allocation made to the Dynamic Transfer Entity under Section H and Appendix A.
- h. The Dynamic Transfer Entity must then modify the Transmission Profile in its Dynamic e-tag to be equal to or less than its Dynamic Transfer capacity allocation by 1500 of the WECC Preschedule day.
- i. The Dynamic Transfer Entity can decrease the transmission profile of its Dynamic e-Tag up to twenty minutes prior to the hour of delivery.
- j. The Dynamic e-Tag should represent the Dynamic Transfer capacity needed to meet the Dynamic Transfer Entity's obligation in the CAISO market or other COI transaction as represented by valid e-Tags.

J. Limitations on Dynamic Transfer

1. A Dynamic Schedule will be allowed to move from its operating level at the beginning of the Operating Hour up to the BPA determined maximum allowed MW for a Dynamic Transfer within the Operating Hour in one direction over the path. For Dynamic Schedules on the COI this is the lesser of its Transmission Profile or allocation under Section I of this Business Practice.
2. A Pseudo-Tie on BPA's network will be allowed to move within a BPA assigned bandwidth around the estimated usage shown on the Type-Pseudo-Tie e-Tag within the Operating Hour in one direction over the path.
3. The Transmission Profile shall not be exceeded during the hour of flow. This applies to both Dynamic Schedules and Pseudo-Ties.
4. Pseudo-Ties are not allowed on the COI.
5. BPA may limit or freeze a Dynamic Transfer (including ramp rates) into, out of or through BPA's Balancing Authority Area at any time if the reliability of the FCRTS or associated interconnection is threatened where the Dynamic Transfer is a contributing factor to the problem being encountered, even if no other transactions or ATC are curtailed. In more serious cases, BPA may also have to curtail ATC to maintain reliability.
6. Examples of when BPA may take action to limit or freeze a Dynamic Transfer include, but not limited to:
 - a. staying within acceptable limits during real-time operations;
 - b. performing acceptably after contingencies; and
 - c. effecting restoration after loss of system elements.
7. The Dynamic Transfer limit will be the lower of the reliability limit or the Transmission Profile on the e-Tag. Failure to comply with any Dynamic Transfer limit shall be subject to the Failure to Comply Penalty consistent with BPA's Failure to Comply Business Practice, as may be replaced or revised.
8. BPA is the path operator of the northern portion of the COI. BPA is also the Balancing Authority in which the northern portion of the COI is located.
9. Each Dynamic Transfer over the COI must be monitored and operated through BPA's Balancing Authority Area without regard to whose transmission rights are used.

10. COI Dynamic Transfer schedules are currently limited to 400 MW per hour during all hours. BPA expects to revise the Dynamic Transfer scheduling limits for the COI from time to time based on new studies or changes in COI operating conditions. BPA will make any change in limits available publicly.
11. Dynamic Schedules over the Northern Intertie are limited to 300 MW in aggregate.
12. Dynamic Transfers are not allowed over the DC Intertie at this time.

K. Dynamic Transfer Ramp Rate

1. BPA may establish a maximum ramp rate limitation for each Dynamic Transfer and may lower the maximum ramp rate due to system conditions.
2. Failure to follow Ramp Rate Limit Signal will be subject to a Failure to Comply Penalty consistent with BPA's Failure to Comply business practice, as may be replaced or revised.

L. Load & Resource One-Day Forecast Requirements

1. Load and resource forecasts are necessary to allow BPA to plan the Transmission System, determine the usage of constrained transmission paths for the calculation of ATC and Available Flowgate Capability and to determine curtailment priority.
2. Dynamic Transfer Entities with loads outside the BPA Balancing Authority Area, which are served with a resource dynamically transferred using transmission in BPA's Balancing Authority Area, must submit or arrange to have submitted one-day forecasts for the use of that resource for each POR/POD combination for each hour of the following delivery day.
3. Forecasts are to be provided on the prescheduled day in accordance with the Preschedule ancillary services window. Forecasts may be updated in accordance with the real-time window.
4. If multiple days are being prescheduled, then hourly load forecasts for all days being prescheduled must be submitted.
5. BPA will treat these one-day forecasts as the equivalent of transmission usage for purposes of ATC, curtailment, and Energy Imbalance calculations.
6. Forecasts will be submitted consistent with the scheduling provisions of the Dynamic Transfer Entity's transmission contract and may not exceed transmission contract demand.

N. Appendix A

Dynamic Transfer Entity's COI DTC allocation will be based on a weighted allocation using the following methodology. The Dynamic Transfer Entity's Total Customer Weighting (TCW) is equivalent to: the proportion of (A) the transmission customer's COI DTC request to (B) the total of all COI DTC requests for that Transmission Provider, multiplied by (C) the Dynamic Transfer Entity's current reserved long-term firm point-to-point transmission service capacity on the COI to (D) the Transmission Provider's total transmission capacity (TTC) on the COI N-S

Restated as a formula: $TCW = A/B \times C/D$

And a Dynamic Transfer Entity's initial COI DTC allocation is equal to the proportion of the customer's Total Customer Weighting to the sum of all Total Customer Weightings for the Transmission Provider multiplied by the Transmission Provider's DTC share, which is the proportion of (E) the Transmission Provider's COI transmission facility ownership share to (F) the rated total transfer capacity of the COI N-S multiplied by the total DTC for the COI (G).

$$DTC1 = (TCW/\text{sum of all TCWs for TP}) \times ((E/F) \times G)$$

where DTC1 is the amount of DTC to be allocated to transmission customer 1 in the first round of allocation.

Further, if after the first round of allocating to all transmission customers making COI DTC requests, a Transmission Provider has unallocated COI DTC remaining, the Transmission Provider will release its unused COI DTC share ("Remainder") to Transmission Providers with remaining unfulfilled requests for COI DTC ("Remaining TPs"), according to (E) transmission facility ownership share of each Remaining TP relative to (G) the sum of the transmission facility ownership of all Remaining TPs.

$$TP \text{ Remainder (TPR)} = \text{Remainder} \times E/G$$

BPA will then allocate its share of the Remainder to its Dynamic Transfer Entities with remaining unfulfilled requests according to the same formula as first-round allocation.

$$DTC2 = (TCW/\text{sum of all TCWs for TP}) \times TPR$$

The sum of the two distributions described above is the total DTC allocation per transmission customer for the time period calculated.

$$\text{Customer's total allocation} = DTC1 + DTC2$$