

# Dynamic Transfer Limits: Operating Procedures for Use of Upper and Lower Transfer Limits on BPA's Transmission System

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BPA Transmission Business Practice

Version **23**

**4/1/2017**/**2/16/2021**

# Dynamic Transfer Limits: Operating Procedures for Use of Upper and Lower Transfer Limits on BPA's Transmission System

## Version 23

This **B**usiness **P**practice governs the use of Upper and Lower Transfer Limits on BPA **M**anaged **P**paths. The user of such limits would use a Security Constrained Economic Dispatch Model (SCED) to dispatch generation over five (5) minute intervals using BPA transmission in support of an Energy Imbalance Market (EIM) or similar purpose. This **B**usiness **P**practice does not seek to foster the development of a SCED, but rather to provide a reliable operational framework if customers wish to use a SCED that uses BPA's **T**ransmission **S**ystem. This **B**usiness **P**practice does not apply to use of a SCED that affects BPA's **T**ransmission **S**ystem but does not actually use the BPA **T**ransmission **S**ystem, a matter BPA will discuss with the appropriate SCED **O**perator should that issue arise.

The heart of a SCED that uses BPA's **T**ransmission **S**ystem is the ability to:

1. Accurately model BPA's **T**ransmission **S**ystem in real time and on a forecasted basis over the next few operating hours;
2. Forecast the impact on BPA's system of power flows resulting from dispatching multiple generators in response to short term price signals, such as five (5) minute intervals (referred to as "**M**arket **F**low");
3. Control **M**arket **F**low in real time within applicable constraints on BPA's **T**ransmission **S**ystem taking into account current power flows on each affected **F**low-gate, Historic **U**ses of DTC by EIM participants, current DTC **A**wards granted to EIM participants, **Dispatch** **O**rders, and **S**ystem **O**perating **L**imits that affect system reliability; and
4. Respond to requests to provide congestion relief as may have been agreed between BPA and the SCED **O**perator.

The successful implementation of a SCED that uses BPA transmission requires communication equipment and systems that allow for timely exchange of data between BPA and the SCED **O**perator. This **B**usiness **P**practice describes the data exchange needed for successful operation of a SCED.

To protect the BPA **T**ransmission **S**ystem from adverse impacts, the SCED must incorporate constraints on BPA's **T**ransmission **S**ystem including **S**ystem **O**perating **L**imits, RAS arming constraints, voltage limitations, stability and other operating limits and other constraints that affect system reliability. BPA will provide these constraints by developing **U**pper and **L**ower **T**ransfer **L**imits for each applicable BPA managed path that will limit movement of SCED **M**arket **F**low across each managed path over each five (5) minute interval. Initially, these

limits will be based on ~~h~~Historic ~~u~~Use of BPA’s Transmission sSystem by generating facilities subject to the SCED. BPA expects to develop nomograms based on the characteristics of BPA’s Transmission sSystem to set these limits.

~~Use of Dynamic Transfer Capability on the Northwest AC Intertie (NWACI) is governed by a different business practice found at [Dynamic Transfer Operating and Scheduling Requirements]. Dynamic Transfers are not currently allowed on the DC Intertie. Thus, a SCED Operator may not allow dynamic movement of market flow on the DC Intertie.~~

BPA plans to monitor the performance of the Upper and Lower Transfer Limits and of initial SCED Participants prior to developing any penalty or incentive structure to comply with this ~~B~~business ~~P~~practice.

For more information, visit the [BPA Transmission Business Practices webpage](#) or submit questions to [techforum@bpa.gov](mailto:techforum@bpa.gov).

## Table of Contents

<del>A.</del> <u>Becoming a SCED Participant</u> .....	<del>3</del> <u>3</u>
<del>B.</del> <u>Limitations for an On Demand Resource</u> .....	<del>3</del> <u>3</u>
<del>C.</del> <u>Adding a Generating Facility to a SCED</u> .....	<del>4</del> <u>4</u>
<del>D.</del> <u>SCED Operator Eligibility Requirements</u> .....	<del>5</del> <u>5</u>
<del>E.</del> <u>Congestion Relief</u> .....	<del>6</del> <u>6</u>
<del>A.</del> <u>Definitions</u> .....	<del>2</del> <u>2</u>
<del>B.</del> <u>Becoming a SCED Participant</u> .....	<del>3</del> <u>3</u>
<del>C.</del> <u>Limitations for an On Demand Resource</u> .....	<del>3</del> <u>3</u>
<del>D.</del> <u>Adding a Generating Facility to a SCED</u> .....	<del>4</del> <u>4</u>
<del>E.</del> <u>SCED Operator Eligibility Requirements</u> .....	<del>4</del> <u>4</u>
<del>F.</del> <u>Congestion Relief</u> .....	<del>5</del> <u>5</u>

## ~~A.~~ Definitions

~~Unless otherwise defined herein, capitalized terms are defined in Federal Energy Regulatory Commission (FERC) OASIS Status Code Definitions, North America Reliability Council (NERC), Western Electric Coordinating Council (WECC), or their successor(s).~~

- ~~1.~~ Lower Transfer Limit: The maximum MW amount by which Market Flow may decrease over the next five minutes relative to the Market Flow resulting from the aggregate 15 minute schedules for the multiple generators dispatched by a SCED for the current scheduling interval. For example, if (A) the current 15 minute Market Flow resulting from the aggregate generation schedules were 100 MW, (B) the current Market Flow were 125 MW, and (C) the Lower Transfer Limit were 40 MW, Market Flow may be decreased

~~over the next five minutes by 65 MW to 60 MW (the current 15 minute Market Flow Schedule (100 MW) less the current Lower Transfer Limit (40 MW)).~~

- ~~2. Market Flow: The forecasted aggregate power flow across a managed path resulting from the dispatch of multiple generators under the control of a SCED.~~
- ~~3. SCED: A security constrained economic dispatch model.~~
- ~~4. SCED Operating Procedures: Operating protocols between BPA and the SCED Operator relating to a SCED using BPA's system.~~
- ~~5. SCED Operator: The entity that will operate a SCED using BPA's system.~~
- ~~6. SCED Participant: An entity that has agreed to allow a SCED Operator to use its SCED to control the entity's generators where doing so may have more than a de minimus impact on a BPA managed path through the use of BPA's system.~~
- ~~7. Upper Transfer Limit: The maximum MW amount by which Market Flow may increase over the next five minutes relative to the Market Flow resulting from the aggregate 15 minute schedules for the multiple generators dispatched by a SCED for the current scheduling interval. For example, if (A) the current 15 minute Market Flow resulting from the aggregate generation schedules were 100 MW, (B) the current Market Flow were 125 MW, and (C) the Upper Transfer Limit were 50 MW, Market Flow may be increased over the next five minutes by 25 MW to 150 MW (the current 15 minute schedule Market Flow (100 MW) plus the current Upper Transfer Limit (50 MW)).~~

### B.A. Becoming a SCED Participant

1. A customer is only eligible to become a SCED Participant if they are utilizing a SCED as defined in this Business Ppractice.
2. An entity seeking to become a SCED Participant must notify BPA of its intent to become a SCED Participant through the SCED Participant's Transmission Account Executive.
3. Any new SCED Participant must execute appropriate agreements necessary for it to participate in the SCED and SCED Operating Procedures, cost reimbursement agreement and other agreements as may be requested by BPA.
4. The new SCED Participant must meet the requirements for adding a new generating facility to a SCED described in Section DC of this business practice.

### C.B. Limitations for an On Demand Resource

1. To support the needs of a SCED Participant or to meet other dynamic uses that cannot be met with a Dynamic Transfer Capability award, BPA will establish Upper Transfer Limits and Lower Transfer Limits for each applicable BPA flowgate.
2. Each Upper Transfer Limit and each Lower Transfer Limit constitutes a dispatch directive.
3. Upper Transfer Limits and Lower Transfer Limits may be based on:
  - 4.a. \_\_\_\_\_ Historic use of BPA managed paths by generating facilities under the control of the SCED Operator;

- ~~5.b.~~ Static nomograms BPA may establish for each managed path by season or other time period; or
- ~~6.c.~~ Real-time nomograms that may change with transmission system conditions.
- ~~7.4.~~ BPA may change an Upper Transfer Limit or Lower Transfer Limit at any time to:
- ~~8.a.~~ Protect reliability, to respond to a loss of communication or data transfers between the SCED Operator and BPA to account for changing transmission system conditions;
- ~~9.b.~~ ~~To a~~ Address a failure to perform according to the requirements of this business practice or applicable SCED ~~o~~operating ~~c~~conditions; and
- ~~10.c.~~ As may be needed to further the purpose of BPA's SCED policies.
- ~~11.5.~~ BPA will make these limits available electronically in real-time to each SCED Operator.
- ~~12.6.~~ The costs to BPA of installing communications or other equipment necessary to make use of such limits, and the costs of maintaining such limits, shall be paid by the SCED Participants making use of these limits.
- ~~13.7.~~ Each SCED Participant must identify the generating facilities that will be dispatched by the SCED.

### D.C. Adding a Generating Facility to a SCED

1. A SCED Participant may add its generating facility or facilities that will be dispatched by a SCED by:
  - a. Notifying BPA of its desire to add a generating facility through the SCED Participant's Transmission Account Executive;
  - b. Identifying the generating facility and describing its operating characteristics;
  - c. Agreeing to pay BPA's cost of installing any communication equipment or systems needed to add the generating facility to its SCED;
  - d. Providing historic data BPA may request concerning past operations; and
  - e. Providing such other information as BPA may request.
2. BPA will provide an estimate of the costs of adding the generating facility to the SCED and provide a reimbursable agreement for such costs, if such costs are necessary.
3. BPA anticipates that it will take up to 90 days to install and test communication equipment and to make system changes necessary to add a generating facility.
4. Such generating facility may also require dynamic scheduling capability on BPA's Network Transmission System that can be obtained via BPA'sthe Dynamic Scheduling Capability: Requesting and Awarding Business Practice.
5. Once the necessary communication and systems changes are installed and tested, BPA will notify the SCED Participant that the generating facility may be dispatched by the SCED.

## E.D. SCED Operator Eligibility Requirements

1. BPA will approve the use of Upper and Lower Transfer Limits by a SCED Operator whose SCED uses BPA's Transmission sSystem if that SCED Operator meets the following requirements:
  - a. Maintains an accurate, up-to-date model acceptable to BPA ~~comprised of a set of practices that will be used to satisfy the requirements of B.3 below~~
  - b. Modifies its SCED to include data to be provided by BPA or ~~PEAK~~the Reliability Coordinator from time to time that accurately describes BPA's Transmission sSystem topology for purposes of the SCED.
  - c. Demonstrates that the SCED is capable of:
    - i. Accurately modeling BPA's Transmission sSystem including sSystem eOperating lLimits by managed path, voltage limitations, stability and other operating limits and other constraints that affect transmission system reliability;
    - ii. Accurately Fforecasting the impact on BPA's system of Market Flow;
    - iii. Controlling Market Flow in real-time within applicable constraints on BPA's Transmission sSystem, including Upper Transfer Limits, Lower Transfer Limits, System Operating Limits or other constraint as these limitations may change from time to time; and
    - iv. Responding to requests to provide congestion relief as may have been agreed between BPA and the SCED Operator.
  - ~~2-d.~~ Continuously updates its SCED to maintain the functions described in this section as BPA's system topology changes.
  - ~~3-e.~~ Agrees to SCED Operating Procedures.
  - ~~4-f.~~ Installs communication equipment and systems necessary to meet the requirements of this business practice and SCED Operating Procedures at the SCED Operator's or SCED Participant's expense.
  - ~~5-g.~~ Agrees to allow BPA to validate the effectiveness and accuracy of the model as requested.
  - ~~6-h.~~ Provides other information that BPA may request, such as:
    - ~~a-i.~~ Real-time data at least every five (5) minutes concerning each SCED Participant's current system status in a form and electronic format acceptable to BPA;
    - ~~b-ii.~~ Real-time data at least every five (5) minutes concerning each SCED Participant's forecasted system status in five (5) minute intervals over the next hour (or other appropriate time interval acceptable to BPA) in an electronic format acceptable to BPA; and
    - ~~c-iii.~~ Real-time data concerning each SCED Participant's forecasted system status in ~~fifteen~~15 minute intervals over the next two (2) hours (or other appropriate time interval acceptable to BPA) in an electronic format acceptable to BPA.

## F.E. Congestion Relief

1. If the SCED Participant's schedules are curtailed, BPA may request a SCED Operator to provide congestion relief on a designated managed path by notifying the SCED Operator of the amount and duration of relief needed under procedures set forth in the applicable SCED Operating Procedures.
2. If the SCED Operator does not respond to a request for congestion relief, or if the SCED Operator is unable to provide all of the requested relief, BPA may take appropriate action to obtain relief from the SCED pParticipant.

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