Short-Term Available Transfer Capability (ST ATC) Project Update

July 25, 2023

Agenda

1. Completed ST ATC Improvements

2. In-flight ST ATC Improvements

3. Proposed ST ATC Improvement

4. Wrap up

5. Appendix – ATC Formulas (NERC Time Horizon)

Completed ST ATC Improvement #1

Description: Accounting for the shared ownership of the Cross Cascades North path in the base Existing Transmission Commitment (ETC) studies for this path

1. The Cross Cascades North path definition includes both BPA-owned lines and a Puget Sound Energy-owned line

2. BPA is party to a shared allocation agreement covering Total Transfer Capability (TTC) across this path and allocates TTC in accordance with this agreement

3. Beginning with November 2022, BPA started to account for the shared ownership of this path within the base ETC studies as well

   a. BPA is accomplishing this by only modeling the BPA-owned lines in the Cross Cascades North path definition used in the base ETC studies

4. Change was fully implemented to OASIS as of May 17th, 2023

Completed ST ATC Improvement #2

Description: Aligned the path definitions used to calculate Power Transfer Distribution Factors (PTDFs) and the base ETCs for the Cross Cascades North, Columbia Injection and Wanapum Injection paths

1. The path definitions for Cross Cascades North, Columbia Injection and Wanapum Injection include lines that are not owned by BPA

2. BPA only sells transmission capacity across the BPA-owned lines for these paths

3. The base ETC studies for these paths are determined by using only the BPA-owned lines in the path definitions

4

Completed ST ATC Improvement #2 (cont.)

4. BPA is now only modeling the BPA-owned lines when calculating the PTDFs used in the commercial ST ATC calculations across these paths

5. With this change, BPA is reflecting BPA's share of these paths in all components of the commercial ST ATC calculation:

   a. The TTCs reflect BPA's share of these paths

   b. The base ETCs reflect flows on only the BPA-owned lines

   c. The PTDFs used in the ST ATC calculation are based on the BPA-owned lines in the path definitions for these paths

6. Change was implemented to OASIS on May 17th, 2023

Completed ST ATC Improvement #3

Description: Added the North of Grizzly (GRZN) ATC path

1. To manage load growth and congestion in Central Oregon, BPA has added the North of Grizzly ATC path in both the NERC time horizon (0-13 months) and the Planning time period (beyond 13 months)

2. Path includes the lines of Buckley-Grizzly #1 500-kV, John Day-Grizzly #1 & #2 500-kV, and Maupin-Redmond #1 230-kV and is flow-based

3. BPA is calculating and posting ST and long-term ATC for North of Grizzly

    a. New TSRs across the network are being evaluated for ST and/or long-term ATC across this path

4. BPA is managing congestion across this path

Completed ST ATC Improvement #3 (cont.)

5. Path was added on May 17th, 2023, with an effective date of June 1st, 2023

6. BPA is monitoring the interaction of this path with the AC Intertie (NWACI) to ensure firm rights across the AC Intertie (NWACI) are being respected

In-flight
ST ATC Improvements
(previously discussed in earlier meetings)

In-flight ST ATC Improvement #1

Description: Update generation data for the Headwater federal hydro projects in the heavy load base ETC cases

1. BPA is updating the Headwater project generation data in BPA's heavy load base ETC cases

    a. The Headwater projects are Libby, Hungry Horse, Dworshak, and Albeni Falls

2. BPA is using the 90th percentile rate case generation values for these projects, as this data already exists and this methodology allows for a repeatable process to update these values

3. BPA is phasing this in as monthly base ETC studies are updated

    a. BPA implemented this change for the June through October studies on May 17th, 2023

    b. BPA will incorporate this change into the November through February studies on October 18th, 2023 and the March through May studies in February 2024

9

In-flight ST ATC Improvement #2

Description: Add the North of Pearl ATC path to manage the transmission system in the Portland metro area

1. In order to manage reliability concerns driven by load growth and new TSRs in the Portland metro area, BPA is adding congestion management tools and an ATC path in this area

2. North of Pearl path details:

   a. Path includes the lines of Pearl-Keeler #1 500-kV (BPA-owned), McLoughlin-Sherwood-Pearl Tap #1 230-kV (BPA/PGE jointly owned), and Pearl-Sherwood #1 & #2 230-kV (BPA/PGE jointly owned)

   b. Path is being added in both the NERC time horizon (0-13 months) and the Planning time period (beyond 13 months)

   c. Path is flow-based

   d. The implementation of this path will not change the customer interface or scheduling practices on the flow-based or 1:1 paths (no new scheduling points)

10

In-flight ST ATC Improvement #2 (cont.)

3. BPA will add the North of Pearl path to OASIS on October 18th, 2023, and will manage the path starting November 1st, 2023

4. ATC impacts upon path addition to OASIS on October 18th, 2023:

    a. Customers will see North of Pearl ST ATC values in OASIS for October 18th and beyond

    b. Since the path will not be managed until November 1st, the North of Pearl ST ATC values for October 18th to November 1st will be adjusted upwards so new TSRs that span these dates are not refused due to a lack of ST ATC on this path during the October 18th to November 1st time frame

    c. Once the path is added to OASIS, any portion of any new TSR requiring service for November 1st and beyond will require ST ATC, as posted to OASIS

    d. BPA will not be calculating or posting ATC across the flow-based paths for the Planning time period (beyond 13 months) starting October 1st, 2023 – new long-term TSRs that impact flow-based paths will be evaluated via the new study process that will be effective October 1st, 2023

In-flight ST ATC Improvement #2 (cont.)

In-flight ST ATC Improvement #2 (cont.)

5. Additional impacts:

    a. BPA will manage congestion across this path starting on November 1st, 2023

    b. BPA will update the ATC Implementation Document, constraint maps, and other customer tools posted to Acquiring Transmission - Bonneville Power Administration (bpa.gov)

In-flight ST ATC Improvement #3

Description: Determine how to manage the transmission system in the Goldendale area

1. BPA is seeing new transmission service requests due to new generation in this area

2. BPA is still evaluating the best option to manage the transmission system in the Goldendale area

   a. BPA is preliminarily referring to this area as South of Knight

3. BPA will continue discussions with customers and/or owners of facilities regarding the Goldendale area after we complete more analysis

4. There is no implementation date at this time

In-flight ST ATC Improvement #4

Description: Development of ST ATC metrics

1. BPA is continuing to work on ST ATC metrics development

2. BPA has operationalized a basic internal report to identify large ST ATC swings

3. BPA utilized the report to monitor ST ATC swings during our last system update on May 17th, 2023

4. More work is required so that BPA can enhance this report and utilize it to monitor ST ATC changes on a more frequent basis

5. BPA is using the various reports developed to date to ensure that BPA's ST ATC improvements are data driven

Proposed
ST ATC Improvement

Proposed ST ATC Improvement #1

Description: Update the methodology used to balance generation and load in the heavy load base ETC cases

1. Currently, if there is more generation than load plus committed exports in the heavy load base ETC cases, BPA reduces all excess generation pro rata, except for the stressed Federal Columbia River Power System zone and the Columbia Generating Station

2. In reality, generation is not reduced pro rata; data shows generation is reduced by fuel type

3. BPA would like to update the load and generation balancing methodology used in the heavy load base ETC cases to better align with the existing data on how generation is reduced in the region

17

Proposed ST ATC Improvement #1

4. Proposed generation and load balancing methodology:

    a. Aggregate the generators in the WECC case by fuel type and assign these aggregated fuel groups a scaling factor

        – Scaling factor of 10: Coal, distillate fuel oil, natural gas, wood/wood waste solids

        – Scaling factor of 1: Landfill gas, pumped storage, energy storage

        – Scaling factor of 0.1: Hydro

        – Scaling factor of 0.01: Solar, wind

    b. Columbia Generating Station will not be scaled, as this nuclear plant is always modeled on

    c. Power flow software will use the scaling factors to calculate a participation factor for each generator, and reduce excess generation based on how each generator participates as part of the whole generation fleet

Proposed ST ATC Improvement #1 (cont.)

5. Example:

Generator (Fuel Type)	Nameplate	Scaling Factor	Participation Factor (Nameplate x Scaling Factor)	Participation % for Gen Reduction (participation factor for generator / total of all participation factors)
Grand Coulee (Hydro)	6850	0.1	685	8.8
Centralia (Coal)	710	10	7100	91.1
Rock Creek (Wind)	950	0.01	9.5	0.1
Total			7794.5	100

6. In the above example, if the ETC base case had 100 MW of excess generation (and if this were not a case that stressed the Upper Columbia zone which includes Grand Coulee), then Grand Coulee (hydro) would reduce by 8.8 MW, Centralia (coal) by 91.1 MW, and the Rock Creek (wind) by 0.1 MW in order to balance the case

Proposed ST ATC Improvement #1 (cont.)

7. Sample base ETC differences* for base ETC used in firm ST ATC calculations:

Month: JUN	ETC MW diff
RAVER-PAUL N>S	337
SOUTH OF ALLSTON N>S	-32
NORTH OF HANFORD N>S	34
WEST OF MCNARY E>W	-236
WEST OF SLATT E>W	-46
CROSS CASCADES NORTH E>W	745
CROSS CASCADES SOUTH E>W	450
SOUTH OF ALLSTON S>N	0
NORTH OF HANFORD S>N	-269
WEST OF JOHN DAY E>W	125
SOUTH OF BOUNDARY N>S	27
WEST OF LOMO E>W	202
WANAPUM INJECTION N>S	-8
COLUMBIA INJECTION N>S	6
SOUTH OF CUSTER N>S	2
NORTH OF ECHO LAKE S>N	55
NORTH OF GRIZZLY N>S	79

* base ETC differences were determined by comparing the current balancing methodology with the proposed balancing methodology for the June ETC base case

Proposed ST ATC Improvement #1 (cont.)

8. Implementation date: BPA is planning to implement this new balancing methodology starting with the November through February heavy load base ETC cases, which will be released to OASIS on October 18th, 2023

Wrap up

1. BPA will continue to work on the in-flight and proposed ST ATC changes and will update its ATCID prior to implementation of any changes

    a. BPA will communicate additional information and/or implementation dates via Tech Forum

2. Comments on today's update are due by Tuesday, August 8th, 2023

3. Please send Questions/Comments to techforum@bpa.gov, with a copy to your Account Executive

22

Appendix – ATC Formulas (NERC Time Horizon)

The firm ATC formula is:

$$ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + Counterflows_F$$

The non-firm ATC formula is:

$$ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_S - TRM_U + Postbacks_{NF} + Counterflows_{NF}$$

Where:

ATC is the firm Available Transfer Capability for the ATC Path for that period.

TTC is the Total Transfer Capability of the ATC Path for that period.

ETC is the sum of existing firm commitments for the ATC Path during that period.

CBM is the Capacity Benefit Margin for the ATC Path during that period.

TRM is the Transmission Reliability Margin for the ATC Path during that period.

TRM_U is the Transmission Reliability Margin that has not been released for sale as non-firm capacity

Postbacks are changes to firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.

Counterflows are adjustments to firm Available Transfer Capability as determined by the Transmission Service Provider and specified in their ATCID.

F subscript refers to Firm; **NF subscript** refers to Non-Firm; **S subscript** refers to Scheduled