Available Transfer Capability Implementation Document (MOD-001-1a)

Bonneville Power Administration
Transmission Services

Effective Date: ~~October 20, 2021~~January xx, 2022

Contents

I. Purpose

This BPA Available Transfer Capability Implementation Document (ATCID) addresses all of the requirements of North American Electric Reliability Corporation (NERC) Reliability Standard MOD-001-1a Available Transmission System Capability. This ATCID is specifically required by MOD-001-1a, R3 and its sub-requirements. This ATCID also outlines BPA's Postback Methodology as required by North American Energy Standards Board (NAESB) Wholesale Electric Quadrant business practice standards.

This ATCID only applies to ATC calculations through month 13.

II. Definitions

All capitalized terms used in this ATCID are either contained in NERC's Glossary of Terms, NAESB WEQ-000, or are defined in this ATCID.

Defined terms specific to BPA include:

- **Federal Columbia River Power System (FCRPS):** The Transmission System constructed and operated by BPA and the 31 federally-constructed hydroelectric dams[1] on the Columbia and Snake Rivers, and the Columbia Generating Station nuclear plant. Each entity is separately managed and financed, but the facilities are operated as an integrated power System.
- **Federal Columbia River Transmission System (FCRTS):** The FCRTS is comprised of BPA's main grid network Facilities (Network), Interconnections with other Transmission Systems (External Interconnections[2]), Interties,[3] delivery Facilities, subgrid Facilities, and generation Interconnection Facilities within the Pacific Northwest region and with western Canada and California.
- **Long-Term Reservation:** a confirmed reservation that has duration greater than or equal to 365 days
- **Short-Term Reservation:** a confirmed reservation that has duration less than 365 days

[1] Albeni Falls, Anderson Ranch, Big Cliff, Black Canyon, Boise River Diversion, Bonneville, Chandler, Chief Joseph, Cougar, Detroit, Dexter, Dworshak, Foster, Grand Coulee, Green Peter, Green Springs, Hills Creek, Hungry Horse, Ice Harbor, John Day, Libby, Little Goose, Lookout Point, Lost Creek, Lower Granite, Lower Monumental, McNary, Minidoka, Palisades, Roza and The Dalles

[2] Northern Intertie, Reno-Alturas Transmission System, West of Hatwai, West of Garrison and LaGrande paths.

[3] California-Oregon AC Intertie, Pacific DC Intertie, and Montana Intertie.

III. Overview

BPA owns and provides Transmission Service over the FCRTS. BPA is registered with NERC as a Transmission Operator (TOP) and Transmission Service Provider (TSP), among other registrations.

Methodologies Selected

MOD-029-2a

BPA has elected to use the Rated System Path Methodology (MOD-029-2a) to calculate ATC for its ~~ATC Path~~paths. The description of how BPA implements this methodology for these paths is included in this ATCID. (MOD-001 R1)

MOD-008-1

BPA maintains Transmission Reliability Margin (TRM) as described in NERC Standard MOD-008-1 for its Northern Intertie, West of Garrison E>W and Satsop Injection ~~ATC Path~~paths. The description of how BPA implements TRM can be found in BPA's TRM Implementation Document (TRMID), found on BPA's website. BPA does not maintain TRM for any other ~~ATC Path~~paths.

Methodologies Not Applicable to BPA

BPA does not use the Area Interchange Methodology (MOD-028-2), the Flowgate Methodology (MOD-030-2), or a Capacity Benefit Margin (CBM) (MOD-004-1). Therefore these standards are not applicable to BPA.

ATC Calculations

ATC Calculation Periods

BPA calculates ATC values using the Rated System Path Methodology for the following time periods: (MOD-001 R2)

- Hourly values for up to 168 hours. The next hour may be calculated in subhourly intervals, with the most limiting subhourly ATC value being the hourly value. (MOD-001 R2.1)
- Daily values for day 3 through day 90. For days 3 to 7 (up to hour 168), the daily ATC value is the most limiting hourly ATC value for that day. (MOD-001 R2.2)
- Monthly values for month 2 through month 13. For months 2 and 3 (up to day 90), the monthly ATC value is the most limiting daily ATC value for that month. (MOD-001 R2.3)

Frequency of ATC Recalculation

BPA recalculates ATC on the following frequency, even if the calculated values identified in the ATC equation are unchanged: (MOD-001 R8)

- Hourly, at least once per hour. (MOD-001 R8.1)
- Daily, at least once per day. (MOD-001 R8.2)

- Monthly, at least once per day. (MOD-001 R8.3)

BPA may recalculate ATC values more frequently due to changes in Total Transfer Capability (TTC), Power Transfer Distribution Factors (PTDFs), system issues or as deemed necessary.

Limiting Assumptions

~~BPA operates the Bulk Electric System within equipment and electric System thermal, voltage, and Stability Limits so that instability, uncontrolled separation, or cascading failures of the System will not occur as a result of a sudden disturbance or unanticipated failure of the System elements. BPA has some paths that are only thermally limited and some paths that move between being thermally limited and stability limited depending on the outage or System conditions. For those paths that move between being stability limited[4] and thermally limited, the System conditions for such paths determine the type of limitation and which section of this document applies for the duration of the System conditions.~~

~~**Stability Limited Paths**~~

BPA studies assumptions of various System conditions to develop ~~the System Operating Limits (SOLs)~~TTCs for its paths for ~~its~~ the planning of operations time frame. The governing TTCs for each time frame are established from these planning of operations studies, based on the time period being calculated and the reason for the change in TTC. BPA uses these TTCs in its ATC calculations. There are no additional TTC studies conducted to establish the path TTCs used in the ATC calculations. ~~Paths are stability limited when the Stability Limit is lower than the thermal limit. When this is the case BPA uses the SOL as the TTC in its ATC calculations.~~ Therefore when determining the TTC, BPA ~~uses studied~~studies assumptions that are no more limiting than those used ~~to determine the SOLs~~ in its planning of operations for the corresponding time period, when such planning of operations has been performed for that time period. (MOD-001 R6)

~~BPA studies assumptions of various system conditions to develop TTCs for thermally limited paths. When determining the path TTC, BPA studies assumptions that are no more limiting than those used in its planning of operations studies for the corresponding time period, when such planning of operations has been performed for that time period. (MOD-001 R6)~~

Commented [A1]: Paragraph explaining BPA has thermal and stability limited paths. Not specific to how BPA calculates ST ATC. BPA recommends deleting this language.

MOD-030 distinguished between these different types of paths but Mod-029 does not:

MOD-030, R2.4. Establish the TFC of each of the defined Flowgates as equal to: - For thermal limits, the System Operating Limit (SOL) of the Flowgate. - For voltage or stability limits, the flow that will respect the SOL of the Flowgate.

Commented [A2]: The language from separate "Thermally Limited Paths" and "Stability Limited Paths" sections has been consolidated. Additional wording included to clarify how BPA meets the MOD-001 R6 requirement.

Commented [A3]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion.

[4] ~~Stability limited paths may include COI; North of Hanford, N-S; West of Garrison; Northern Intertie; Cross Cascades North; Cross Cascades South.~~

When calculating ATC, BPA ~~subtracts its Existing Transmission Commitments (ETC) from~~uses the TTCs determined ~~from the studied assumptions that BPA uses to develop SOLs for~~in its planning of operations time frame ~~,~~ in its ATC calculations. There are no additional TTC studies conducted to establish the path TTCs used in the ATC calculations.~~No additional studies beyond those developed to determine SOLs and used in calculating TTCs are performed~~. For its flow-based paths, ~~to calculate ATC.~~ BPA calculates ETC by summing base ETC from power flow cases with interim ETC from PTDFs. BPA ~~may~~ use~~s more~~ the most recent System condition information to calculate its hourly, daily and monthly ~~in its SOL~~ PTDFs ~~calculations~~in the planning of operations time frame. The ETCs used in BPA's ATC calculations are recalculated with these updated PTDFs per each time frame ~~when the studies are updated after the ETC Cases are performed~~. ~~However, this is not considered a difference in assumptions. Therefore, t~~There are no additional ETC studies beyond the base ETC and PTDF calculations performed during the planning of operations time frame. Therefore, BPA does not use ~~different~~ more limiting assumptions ~~used to~~when calculat~~e~~ing ATC in its planning of operations time frame ~~to compare to assumptions used in BPA's planning of operations~~. (MOD-001 R7)

~~BPA may use more recent system condition information in its TTC calculations when the studies are updated after the ETC Cases are performed. However, this is not considered a difference in assumptions. Therefore, there are no different assumptions used to calculate ATC to compare to assumptions used in BPA's planning of operations. (MOD-001 R7)~~

Commented [A4]: The language from separate "Thermally Limited Paths" and "Stability Limited Paths" sections has been consolidated. Additional wording included to clarify how BPA meets the MOD-001 R7 requirement.

Commented [A5]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion.

~~**Thermally Limited Paths**~~

~~BPA studies assumptions of various system conditions to develop TTCs for thermally limited paths. When determining the path TTC, BPA studies assumptions that are no more limiting than those used in its planning of operations studies for the corresponding time period, when such planning of operations has been performed for that time period. (MOD-001 R6)~~

~~BPA may use more recent system condition information in its TTC calculations when the studies are updated after the ETC Cases are performed. However, this is not considered a difference in assumptions. Therefore, there are no different assumptions used to calculate ATC to compare to assumptions used in BPA's planning of operations. (MOD-001 R7)~~

IV. Allocation Processes

BPA uses the same methodology to allocate transfer capability among multiple lines or sub-paths within a larger ~~ATC Path~~path as it uses to allocate transfer capability among multiple owners or users of a~~n~~ ~~ATC Path~~path. For ~~Paths~~ paths where ownership Agreements exist~~s~~, the methodology is to allocate transfer capabilities according to contractual rights defined in individual Agreements among the various owners. These Agreements define the specific percentages of capacity or MW amounts of rights assigned to each owner for specific time periods. Agreements do not exist for three of BPA's flow-based ~~ATC Path~~paths: South of Allston S>N, Columbia Injection N>S and Wanapum Injection N>S. For South of Allston S>N the same allocation methodology described in the SOA N>S Contract ~~(#06TX-12300)~~ is used. For Columbia Injection N>S and Wanapum Injection N>S, BPA determines its share of ~~Total Transfer Capability~~TTC based on BPA's owned transmission lines that make up the flow-based ~~ATC Path~~path when all lines are in service. During outage conditions, individual allocations exist for the loss of each transmission line in the flow-based ~~ATC Path~~path. BPA determines its share of ~~Existing Transmission Commitments~~ETC for Columbia Injection N>S and Wanapum Injection N>S by modeling the full path of BPA's lines only.

Commented [A6]: Recommend deleting the contract number to reduce maintenance

At this time BPA does not allocate transfer capabilities between TSPs to address forward-looking congestion management and seams coordination. (MOD-001 R3.5)

V. Outages

Outages from all TSPs that are internal or adjacent to BPA's Balancing Authority Area (BAA) can be mapped to the WECC base cases. (MOD-001 R3.6.3)

Outage Planning

Outage plans and the policy are posted to the Outage Plans website at:
http://www.bpa.gov/transmission/Reports/Pages/Proposed-Outages.aspx.

Outage Criteria for TTC Calculations

BPA incorporates outages into the TTC calculations after they have been studied by BPA or provided to BPA by another TOP. Generally, BPA studies outages 10 to 16 days prior to the outage start date.

The duration of an outage is not a criteria by which BPA determines which outages to incorporate in its daily and monthly TTC calculations. The most conservative hourly TTC calculated for a given outage or combination of outages becomes the governing TTC for the daily calculation period. Likewise, the most conservative daily TTC for a given outage or combination of outages becomes the governing TTC for the monthly calculation period. (MOD-001 R3.6.1) (MOD-001 R.3.6.2)

VI. Priorities Used to Set TTC

~~Stability Limited Paths~~

BPA may update assumptions and calculate new ~~SOLs~~TTCs when changes to System conditions will significantly impact those limits and may use those updated assumptions to determine new TTC values ~~for stability limited paths~~. The following hierarchy of priorities categorizes the ~~SOL~~TTC values based on the time period being calculated and the reason for the change. This prioritization may then be used to revise the path TTC for a given time period if BPA determines that more recent assumptions to calculate ~~SOL~~ TTC values better reflect updated System information:

~~BPA may update assumptions and calculate new TTCs when changes to System conditions will significantly impact those limits and may use those updated assumptions to determine new TTC values for thermally limited paths. The following hierarchy of priorities categorizes the TTC values based on the time period being calculated and the reason for the change. This prioritization may then be used to revise the path TTC for a given time period if BPA determines that more recent assumptions to calculate TTC values better reflect updated System information:~~

- **Real-time limit (highest priority):** The "Real-time limit" priority governs when BPA updates the assumptions of Ssystem conditions to calculate ~~SOLs~~ TTCs during the Real-time horizon. A change to the ~~SOL~~TTC calculation with the Real-time priority governs all other priorities. For example, if BPA receives an update that a scheduled outage will be extended by two hours early in the Real-time day, BPA ~~will~~ may update the assumptions for the ~~SOL~~TTC calculation accordingly for the additional two hours and may use those same updated assumptions to update the TTC. If there are multiple real-time updates to assumptions for ~~SOL~~TTC calculations, the most recent ~~SOL~~TTC calculated governs.

~~**Real-time limit (highest priority):** The "Real-time limit" priority governs when BPA updates the assumptions of system conditions to calculate TTCs during the Real-time horizon. A change to the TTC calculation with the Real-time priority governs all other priorities. For example, if BPA receives an update that a scheduled outage will be extended by two hours early in the Real-time day, BPA may update the TTC.~~

- **Scheduling limit:** The "scheduling limit" priority may be used occasionally when the assumptions for the ~~SOL~~TTC are not governing or an actual scheduling limit has been imposed. If there is more than one scheduling limit, the lowest scheduling limit governs until a Real-time limit ~~SOL~~TTC is submitted.
- ~~**Scheduling limit:** The "scheduling limit" priority may be used occasionally when the assumptions for the TTC are not governing or an actual scheduling limit has been imposed. If there is more than one scheduling limit, the lowest scheduling limit governs until a Real-time limit TTC is submitted.~~
-

Commented [A7]: The language from separate "Thermally Limited Paths" and "Stability Limited Paths" sections has been consolidated. MOD-030 distinguished between these different types of paths but Mod-029 does not:

MOD-030, R2.4. Establish the TFC of each of the defined Flowgates as equal to: - For thermal limits, the System Operating Limit (SOL) of the Flowgate. - For voltage or stability limits, the flow that will respect the SOL of the Flowgate.

Also removing references to SOL from section and the ATCID in general. The use of SOL also dates back to the use of MOD-030 and BPA recommends streamlining the language to focus on TTC, as this is what is pertinent for the ATC calculation.

Commented [A8]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion.

Commented [A9]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

Commented [A10]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

- **Pre-schedule forecast:** The "pre-schedule forecast" ~~SOL~~ TTC priority may be used for a ~~Path~~ path if the assumptions for the ~~SOL~~TTC calculations are updated for the pre-schedule period. For example, for ~~SOLs~~TTCs calculated for flow-based ~~ATC Path~~paths that are derived using nomograms, if the assumptions are re-evaluated just prior to the pre-schedule day to incorporate updated data inputs, the TTC may be updated. The pre-schedule forecast TTC governs over the 'studied' priority.
- ~~**Pre-schedule forecast:** The "pre-schedule forecast" TTC priority may be used for a Path if the assumptions for the TTC calculations are updated for the pre-schedule period. For example, for TTCs calculated for flow-based paths that are derived using nomograms, if the assumptions are re-evaluated just prior to the pre-schedule day to incorporate updated data inputs, the TTC may be updated. The pre-schedule forecast TTC governs over the 'studied' priority.~~
- **Studied:** The "studied" priority is used when there are outages where a study report has been issued, including those provided by other TOPs. For example, if a study report is issued evaluating assumptions for line outage system conditions, the ~~SOLs~~TTCs in that report govern over any lower-priority ~~SOLs~~TTCs for the duration of the line outage conditions.
- ~~**Studied:** The "studied" priority is used when there are outages where a study report has been issued, including those provided by other TOPs. For example, if a study report is issued evaluating assumptions for line outage system conditions, the TTCs in that report govern over any lower-priority TTCs for the duration of the line outage conditions.~~
- **Estimated known limit:** The "estimated known limit" priority is used to establish unstudied TTCs or to define seasonal ~~Path~~ path TTCs that govern over "short-term seasonal" or "Path Rating" priorities.
- ~~**stimated known limit:** The "estimated known limit" priority is used to establish unstudied TTCs or to define seasonal Path TTCs that govern over "short-term seasonal" or "Path Rating" priorities.~~
- **Short-term seasonal:** The "short-term seasonal" priority is used for TTCs issued for seasonal Path Ratings. As these Ratings may be higher at certain times during the year, the short-term seasonal priority governs over the Path Rating priority. For example, if the longer-term Path Rating for a path is 7800 MW, but seasonally this Rating increases to 8000 MW, the short-term seasonal Rating of 8000 MW governs and is used to set the TTC during the season to which it applies.
- ~~**Short-term seasonal:** The "short-term seasonal" priority is used for TTCs issued for seasonal Path Ratings. As these Ratings may be higher at certain times during the year, the short-term seasonal priority governs over the Path Rating priority. For example, if the longer-term Path Rating for a path is 7800 MW, but seasonally this Rating increases to 8000 MW, the short-term seasonal Rating of 8000 MW governs and is used to set the TTC during the season to which it applies.~~

Commented [A11]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

Commented [A12]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

Commented [A13]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

Commented [A14]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

- **Path Rating:** The "Path Rating" priority is used to set base TTCs using either the Rating of the ~~Paths~~paths, ~~SOLs~~ TTCs studied using normal conditions, ~~SOLs~~ TTCs calculated for the planning horizon, or all of the above. The lowest value resulting from the above calculations governs for the given time period and is used to set the TTC. For example, if under normal conditions the ~~SOL~~ TTC for a path is 4410 MW, but the ~~SOL~~ TTC calculated for the planning horizon is 4100 MW, the lower ~~SOL~~ TTC of 4100 MW governs and is used to set the TTC for ~~this~~ the~~flow-based ATC Path~~path.
- ~~**Path Rating:** The "Path Rating" priority is used to set base TTCs using either the Rating of the Paths, TTCs studied using normal conditions, TTCs calculated for the planning horizon, or all of the above. The lowest value resulting from the above calculations governs for the given time period and is used to set the TTC. For example, if under normal conditions the TTC for a Path is 4410 MW, but the TTC calculated for the planning horizon is 4100 MW, the lower TTC of 4100 MW governs and is used to set the TTC for this flow-based path.~~
- ~~~~
- **Informational limit (lowest priority):** The "informational limit" is used while establishing the initial setup of ~~Paths~~ paths within the scheduling and reservation system. The informational limit is equal to the initial Path Rating of the ~~Path~~path.
- ~~**Informational limit (lowest priority):** The "informational limit" is used while establishing the initial setup of Paths within the scheduling and reservation system. The informational limit is equal to the initial Path Rating of the Path.~~
- ~~~~

Commented [A15]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

Commented [A16]: Language from "Thermally Limited Paths" section. Combined with "Stability Limited Paths" section and recommended for deletion

~~Thermally Limited Paths~~

~~BPA may update assumptions and calculate new TTCs when changes to System conditions will significantly impact those limits and may use those updated assumptions to determine new TTC values for thermally limited paths. The following hierarchy of priorities categorizes the TTC values based on the time period being calculated and the reason for the change. This prioritization may then be used to revise the path TTC for a given time period if BPA determines that more recent assumptions to calculate TTC values better reflect updated System information:~~

- ~~**Real-time limit (highest priority):** The "Real-time limit" priority governs when BPA updates the assumptions of system conditions to calculate TTCs during the Real-time horizon. A change to the TTC calculation with the Real-time priority governs all other priorities. For example, if BPA receives an update that a scheduled outage will be extended by two hours early in the Real-time day, BPA may update the TTC.~~
- ~~**Scheduling limit:** The "scheduling limit" priority may be used occasionally when the assumptions for the TTC are not governing or an actual scheduling limit has been imposed. If there is more than one scheduling limit, the lowest scheduling limit governs until a Real-time limit TTC is submitted.~~
- ~~**Pre-schedule forecast:** The "pre-schedule forecast" TTC priority may be used for a Path if the assumptions for the TTC calculations are updated for the pre-schedule period. For example, for TTCs calculated for flow-based ATC Paths that are derived using nomograms, if the assumptions are re-evaluated just prior to the pre-schedule day to incorporate updated data inputs, the TTC may be updated. The pre-schedule forecast TTC governs over the 'studied' priority.~~

- ~~**Studied:** The "studied" priority is used when there are outages where a study report has been issued, including those provided by other TOPs. For example, if a study report is issued evaluating assumptions for line outage system conditions, the TTCs in that report govern over any lower priority TTCs for the duration of the line outage conditions.~~
- ~~**Estimated known limit:** The "estimated known limit" priority is used to establish unstudied TTCs or to define seasonal Path TTCs that govern over "short-term seasonal" or "Path Rating" priorities.~~
- ~~**Short-term seasonal:** The "short-term seasonal" priority is used for TTCs issued for seasonal Path Ratings. As these Ratings may be higher at certain times during the year, the short-term seasonal priority governs over the Path Rating priority. For example, if the longer-term Path Rating for a path is 7800 MW, but seasonally this Rating increases to 8000 MW, the short-term seasonal Rating of 8000 MW governs and is used to set the TTC during the season to which it applies.~~
- ~~**Path Rating:** The "Path Rating" priority is used to set base TTCs using either the Rating of the Paths, TTCs studied using normal conditions, TTCs calculated for the planning horizon, or all of the above. The lowest value resulting from the above calculations governs for the given time period and is used to set the TTC. For example, if under normal conditions the TTC for a Path is 4410 MW, but the TTC calculated for the planning horizon is 4100 MW, the lower TTC of 4100 MW governs and is used to set the TTC for this flow-based ATC Path.~~
- ~~**Informational limit (lowest priority):** The "informational limit" is used while establishing the initial setup of Paths within the scheduling and reservation system. The informational limit is equal to the initial Path Rating of the Path.~~

VII. Rated System Path Methodology for BPA's ~~ATC Path~~Paths

This section describes how BPA implements the Rated System Path methodology for its ~~ATC Paths~~ paths. It addresses all of the Requirements in Standard MOD-029-2a.

BPA's ~~ATC Path~~Paths

The following tables list BPA's ~~ATC P~~paths. BPA has a combination of 1:1 and flow-based ~~ATC Paths~~ paths, and uses MOD-029-2a to calculate ATC for both.

Table 1, BPA's 1:1 ~~ATC Path~~Paths

1:1 ~~ATC Path~~Path Name	Direction
Northern Intertie Total On Oasis: NI_TOTL_N>S	(N>S)
Northern Intertie Total On OASIS: NI_TOTL_S>N	(S>N)
Montana-Northwest West of Garrison On OASIS: WOGARR_E>W	(E>W)

1:1 ~~ATC Path~~Path Name	Direction
Montana-Northwest West of Garrison On OASIS: WOGARR_W>E	(W>E)
La Grande On OASIS: LAGR_W>E	(W>E)
La Grande On OASIS: LAGR_E>W	(E>W)
Montana Intertie On OASIS: MI_E>W	(E>W)
Reno-Alturas NW Sierra On OASIS: RATS_N>S	(N>S)
Reno-Alturas NW Sierra On OASIS: RATS_S>N	(S>N)
California-Oregon AC Intertie (COI) On OASIS: AC_N>S	(N>S)
California-Oregon AC Intertie (COI) On OASIS: AC_S>N	(S>N)
Pacific DC Intertie On OASIS: DC_S>N	(S>N)
Pacific DC Intertie On OASIS: DC_N>S	(N>S)
Rock Creek On OASIS: ROCKCK_GEN	Gen
John Day Wind On OASIS: JDWIND_GEN	Gen
Satsop Injection On OASIS: SATSOP_GEN	Gen

323 **Table 2, BPA's Flow-Based ~~ATC Path~~Paths**

Flow-based ~~ATC Path~~Path	Direction	Transmission Line Components	Case used for base ETC calculation
North of Hanford On OASIS: NOHANF	(N>S)	Vantage-Hanford 500kV; Grand Coulee-Hanford 500kV; and Shultz-Wautoma 500kV	Heavy load case

Flow-based ~~ATC Path~~Path	Direction	Transmission Line Components	Case used for base ETC calculation
North of Hanford On OASIS: NOHANF	(S>N)	Vantage-Hanford 500kV; Grand Coulee-Hanford 500kV; and Shultz-Wautoma 500kV	Heavy load case
South of Allston On OASIS: SOALSN	(N>S)	BPA -Owned Transmission Lines: Keeler-Allston 500kV; Lexington-Ross 230kV; and and St. Helens-Allston 115kV; Portland General Electric -Owned Transmission Lines: Trojan-St. Marys 230kV; and Trojan-River Gate 230kV; PacifiCorp-Owned Transmission Lines: Merwin-St. Johns 115kV; Astoria-Seaside 115kV; and and Clatsop 230/115kV	Heavy load case
South of Allston On OASIS: SOALSN	(S>N)	BPA -Owned Transmission Lines: Keeler-Allston 500kV; Lexington-Ross 230kV; and St. Helens-Allston 115kV; Portland General Electric -Owned Transmission Lines: Trojan-St. Marys 230kV; and Trojan-River Gate 230kV; PacifiCorp-Owned Transmission Lines: Merwin-St. Johns 115kV; Astoria-Seaside 115kV; and Clatsop 230/115kV	Heavy load case
Paul-Allston On OASIS:PAUL_ALSN	(N>S)	Napavine-Allston #1 500kV; and Paul-Allston #2 500kV	Heavy load case

Flow-based ~~ATC Path~~Path	Direction	Transmission Line Components	Case used for base ETC calculation
Raver-Paul On OASIS: RAVR_PAUL	(N>S)	Raver-Paul 500 kV Line During outage conditions, the following lines are monitored: Raver – Paul #1 500-kV; St. Clair – South Tacoma #1 230kV; Chehalis – Covington #1 230kV; Puget Sound Energy-Owned Transmission Lines: Frederickson– St. Clair 115kV; Electron Heights – Blumaer 115kV	Heavy load case
Cross Cascades North On OASIS: C-CASC_N	(E>W)	BPA-Owned Transmission Lines Schultz-Raver #1, 3, & 4 500kV; Schultz-Echo Lake #1 500kV; Chief Joseph-Monroe 500kV; Chief Joseph-Snohomish #3 & 4 345kV; Rocky Reach-Maple Valley 345kV; Grand Coulee-Olympia 287kV; Bettas Road - Covington #1 230kV. Puget Sound Energy-Owned Transmission Line Rocky Reach – Cascade 230 kV	Heavy load case
Cross Cascades South On OASIS: C-CACS_S	(E>W)	Big-Eddy-Ostrander 500kV; Ashe-Marion 500kV; Buckley-Marion 500kV; Knight-Ostrander 500kV; John Day-Marion 500kV; McNary-Ross 345kV; Big Eddy-Chemawa 230kV; Big Eddy-McLoughlin 230kV; Midway-North Bonneville 230kV; Jones Canyon-Santiam 230kV; and Big Eddy-Troutdale 230kV PGE-Owned Transmission Line Bethel – Round Butte 230 kV	Heavy load case
West of McNary On OASIS: WOMCNY	(E>W)	Coyote Springs-Slatt #1 500kV; McNary-Ross #1 345kV; Harvalum – Big Eddy #1 230 kV; Jones Canyon-Santiam #1 230kV; McNary-John Day #2 500kV	Heavy load case

Flow-based ~~ATC Path~~Path	Direction	Transmission Line Components	Case used for base ETC calculation
West of Slatt On OASIS: WOSLATT	(E>W)	Slatt-Buckley 500kV; and Slatt-John Day 500kV	Heavy load case
West of John Day On OASIS: WOJD	(E>W)	John Day – Big Eddy No. 1 500-kV line (metered at John Day); John Day – Big Eddy No. 2 500-kV line (metered at John Day); and John Day – Marion No. 1 500kV	Heavy load case
South of Boundary On OASIS: SBNDRY	(N>S)	Bell – Boundary #1 230kV; Bell – Boundary #3 230kV; Usk – Boundary #1 230kV; and Boundary 230/115kV Transformer #1	Heavy load case
Columbia Injection On OASIS: CLMBIA	(N>S)	Columbia-Grand Coulee #1 230-kV (metered at Columbia); Columbia-Grand Coulee #3 230-kV (metered at Columbia); Rocky Reach-Columbia #1 230-kV (metered at Columbia); Rocky Reach-Columbia #2 230-kV (metered at Columbia); Columbia-Valhalla #1 115-kV (metered at Columbia); and Columbia-Valhalla #2 115-kV (metered at Columbia)	Heavy load case
Wanapum Injection On OASIS: WANAPM	(N>S)	Midway-Vantage #1 230-kV; and Midway-Priest Rapids #3 230-kV	Heavy load case
West of Lower Monumental On OASIS: W_LOMO	(E>W)	Ashe – Lower Monumental 500kV; Hanford – Lower Monumental 500kV; and McNary – Lower Monumental 500kV	Heavy load case
North of Echo Lake On OASIS: N_ECOL	(S>N)	Echo Lake – Monroe - SnoKing Tap #1 500kV; Echo Lake – Maple Valley #1 500 kV; Echo Lake – Maple Valley #2 500kV; and Covington – Maple Valley #2 230kV	Heavy load case

Flow-based ~~ATC Path~~Path	Direction	Transmission Line Components	Case used for base ETC calculation
South of Custer On OASIS: SCSTER	(N>S)	Monroe - Custer #1 500kV; Monroe - Custer #2 500kV; Bellingham - Custer #1 230kV; and Murray - Custer #1 230kV Line	Heavy load case
West of Hatwai On OASIS: WOH_E>W	(E>W)	Lower Granite-Hatwai 500-kV line Grand Coulee-Bell 6 500-kV line Grand Coulee-Bell 3 230-kV line Grand Coulee-Bell 5 230-kV line Grand Coulee-Westside 230-kV line Talbot-Dry Creek 230-kV line Tucannon River-North Lewiston 115-kV line Devils Gap-Stratford 115-kV line Lind-Warden 115-kV line Creston-Bell 1 115kV line Dry Gulch-Pomeroy 69-kV line	Light load case

BPA will select the Rated System Path Methodology if new ~~ATC P~~paths are implemented, and update the appropriate table above. (MOD-001 R1)

Calculating Total Transfer Capability (TTC)

Data and Assumptions

When calculating TTC for its ~~ATC P~~paths, BPA uses WECC base cases that utilize data and assumptions consistent with the time period being studied. (MOD-029, R1.1) In addition to BPA's TOP area, these WECC base cases model the entire Western Interconnection. Hence, the WECC base cases include all TOP areas regardless if they are either contiguous to BPA's TOP area or are linked to BPA's TOP area by a joint operating Agreement. (MOD-029 R1.1.1.2, R1.1.1.3)

TOP areas contiguous with BPA's TOP area include (MOD-029 R1.1.1.2):

- Avista Corporation (AVA)
- BC Hydro (BCH)
- California Independent System Operator (CAISO)
- City of Tacoma, Department of Public Utilities, Light Division
- Eugene Water and Electric Board (EWEB)
- Idaho Power Company (IPCO)
- Los Angeles Department of Water and Power (LADWP)
- NorthWestern Energy (NWMT)
- NV Energy

- PacifiCorp (PAC)
- Pend Oreille County Public Utility District No. 1
- Portland General Electric (PGE)
- Public Utility District No. 1 of Chelan County
- Public Utility District No. 1 of Clark County
- Public Utility District No. 1 of Snohomish County
- Public Utility District No. 2 of Grant County, Washington
- PUD No. 1 of Douglas County
- Puget Sound Energy, Inc. (PSEI)
- Seattle City Light (SCL)

BPA uses the following data and assumptions in the WECC base cases when calculating TTCs for its ~~ATC P~~paths:

BPA models all existing System Elements in their normal operating condition for the assumed initial conditions, up to the time horizon in which BPA begins modeling outages ~~(see Section V, "Outages")~~. (MOD-029 R1.1.2)

The WECC base cases include generators and phase shifters that meet the guidelines set out in the WECC Data Preparation Manual. (MOD-029 R1.1.3) (MOD-029 R1.1.4)

BPA uses the seasonal Load forecasts contained in the WECC base cases for each BA. (MOD-029 R1.1.5)

Generation and Transmission Facility additions and retirements within the WECC footprint are included in the WECC seasonal operating base cases for the season in which they are energized/de-energized, respectively. BPA engineers modify the WECC base cases to reflect the actual dates of energization/de-energization. (MOD-029 R1.1.6, R1.1.7)

The WECC base cases include Facility Ratings as provided to WECC by the Transmission Owners and Generator Owners. (MOD-029 R1.2)

If Facility changes are made by BPA or another entity, then the base cases will be updated to reflect these changes with a Mid-Season update. (MOD-029 R1.1, R1.2)

The approved seasonal operating base cases that include the Facility changes will not be used until 0 to 16 days prior to the energization or implementation of the Facility change. (MOD-029 R1.1, R1.2)

For periods beyond two weeks, the WECC base cases will be updated as necessary to perform seasonal studies for the current or upcoming season in accordance with the current BPA study processes. (MOD-029 R1.1, R1.2, R2.1)

For ~~stability limited~~all paths, except West of Garrison and Northern Intertie South to North, BPA uses the all lines in service ~~minimum~~ ~~SOL~~ TTC from the relevant seasonal studies when there are no studied outages to set the TTC of the path for the corresponding seasonal time periods.

~~For thermally limited paths, BPA uses a TTC from the relevant seasonal studies when there are no studied outages to set the TTC of the path for the corresponding seasonal time periods~~

For West of Garrison, for the seasons or time periods in which the seasonal studies have not been completed, the most recent year's seasonal study results will be used for setting the TTC for the ~~relevant Path~~path.

For Northern Intertie South to North, for the seasons or time periods in which the seasonal studies have not been completed, the most recent year's seasonal study results will be used for setting the TTC ~~for the relevant Path~~path. BPA uses the minimum ~~SOL~~ TTC from the relevant seasonal studies to set the TTC of the ~~Path~~ path for periods from the next day and beyond. For the Real-time horizon, when there are no studied outages, BPA uses the maximum ~~SOL~~ TTC from the relevant seasonal studies to set the TTC of the ~~Path~~path.

~~For thermally limited paths, BPA uses a TTC from the relevant seasonal studies when there are no studied outages to set the TTC of the path for the corresponding seasonal time periods.~~

BPA models Special Protection Systems (BPA uses the term Remedial Action Schemes or RAS) that currently exist or are projected for implementation within the studied time horizon. (MOD-029 R1.1.8)

The WECC base cases include all series compensation for each line at the expected operating level. (MOD-029 R1.1.9)

BPA uses no other modeling requirements for calculating TTC in addition to those specified in this document. (MOD-029 R1.1.10)

Process to Determine TTC

BPA adjusts generation and Load levels within the WECC power-flow base cases to determine the TTC that can be simulated for each of its ~~ATC P~~paths, while at the same time satisfying all operations planning criteria contingencies, as follows:

BPA studies single and multiple contingencies that are relevant to the ~~Path~~ path being studied. (MOD-029 R2.1)

When modeling normal conditions, BPA models all Transmission Elements in BPA's BAA and adjacent BAAs at or below 100 percent of their continuous Rating. (MOD-029 R2.1.1)

~~When~~ BPA model~~ing~~ contingencies ~~for stability limited paths, refer to~~ as per the current version of "RC West System Operating Limits Methodology for the Operations Horizon" (RC West SOL Methodology) posted on RC West's website ~~https://rc.caiso.com for a detailed description of how BPA determines SOLs used to set TTCs~~. (MOD-029 R2.1.2)

Commented [A17]: Language on thermally limited paths and stability limited paths has been consolidated.

Commented [A18]: Language on thermally limited paths and stability limited paths has been consolidated (see lines 378-381).

When modeling contingencies ~~for thermally limited paths~~, BPA determines TTCs by stressing the system until flows exceed emergency Facility Ratings or voltages fall outside emergency system voltage limits (i.e., the post-Contingency state). If a facility does not have an emergency Facility Rating, the normal Facility Rating is used. If there is no emergency system voltage limit, the normal system voltage limit is used. (MOD-029 R2.1.2) By meeting the criteria in the RC West SOL Methodology, uncontrolled separation should not occur. (MOD-029 R2.1.3)

The ~~Available Transfer Capability (ATC) P~~paths listed below~~, for which BPA uses the Rated System Path Methodology,~~ have TTCs from studies in only the prevailing direction of flow. The TTC values for the non-prevailing direction of flow are determined as follows:

For paths: West of Hatwai, Columbia Injection, Wanapum Injection, South of Custer, North of Echo Lake, South of Boundary, West of Lower Monumental, and the Montana Intertie~~:~~;

Use the prevailing flow direction TTC as the non-prevailing flow direction TTC

For paths: Paul-Allston, Raver-Paul, West of McNary, West of Slatt, and West of John Day~~:~~;

Use the non-RAS TTC as the non-prevailing flow direction TTC

All of BPA's other ~~ATC Path~~ paths have ~~either reliability-based SOLs or~~ TTCs in both the prevailing and non-prevailing directions of flow. (MOD-029 R2.2)

For ~~ATC Path~~ paths where TTC varies due to simultaneous interaction with one or more other ~~Paths~~paths, BPA develops a nomogram, represented either by an equation or its graphical representation, describing the interaction of the ~~Paths~~ paths and the resulting TTC under specified conditions. BPA then calculates a value, based on that nomogram and forecasted System conditions for the time period studied, to develop its TTC values for the affected ~~ATC Path~~ paths. (MOD-029 R2.4)

BPA or the adjacent ~~Path~~ path TOP identifies when the new or increased TTC for a~~n~~ ~~ATC Path~~ path being studied by BPA or the adjacent ~~Path~~ path TOP has an adverse impact on the TTC value of another existing ~~Path~~ path by modeling the flow on the ~~Path~~ path being studied at its proposed new TTC level, while simultaneously modeling the flow on the existing ~~Path~~ path at its TTC level. In doing so, BPA or the adjacent ~~Path~~ path TOP honors the reliability criteria described above. BPA or the adjacent ~~Path~~ path TOP includes the resolution of this adverse impact in its study report for the ~~ATC Path~~ path. (MOD-029 R2.5)

BPA has Transmission Ownership Agreements where multiple ownerships of Transmission rights exist on a~~n~~ ~~ATC Path~~ path. TTC for the affected ~~ATC path~~ paths is allocated according to contractual ownership rights. ~~See section IV, "Allocation Processes" for further details~~. (MOD-029 R2.6)

The ratings for BPA's ~~Available Transfer Capability (ATC) P~~paths whose ratings were established, known, and used in operation since January 1, 1994, have been re-established using updated methods. BPA studies its ~~ATC Path~~ paths, with the exception of LaGrande, on a periodic basis and reconfirms the rating of each ~~ATC Path~~ path based on these studies. These ratings are then used to establish the ~~Total Transfer Capability~~TTC for the path.

Commented [A19]: Removed references to thermally and stability limited paths and streamlined language for better clarify/flow. Also removing web site link to reduce maintenance.

For the LaGrande path, BPA uses the Accepted Rating of the path as defined in the WECC Path Rating Catalog. BPA's LaGrande path is part of the NW-Idaho path (WECC Path 14). The rating of Path 14 was reconfirmed through an updated study in 2010 when the path definition had to be modified due to the addition of the Hemingway Substation by PAC and Idaho Power.

BPA creates a study report that describes the TTC applicable to the outages during the studied time period and includes the limiting Contingencies and the limiting cause for the calculated TTC. The RC West SOL Methodology document ~~(RC West SOL Methodology posted at: https://rc.caiso.com)~~ defines the steps taken and assumptions BPA used to determine TTC for each stability limited ~~ATC path~~ path. BPA creates a study report for each study it performs. The study report relies on the basic assumptions included in RC West SOL methodology and identifies any changes to those basic assumptions. (MOD-029 R2.8)

Commented [A20]: Removing web site link to reduce maintenance.

~~As described in Section III, "Overview," i~~Information regarding TTCs is shared electronically between the appropriate BPA organizations within seven calendar days of the finalization of the study report for the TTCs. BPA sends a notice to all TSPs for the ~~ATC Path~~ paths listed in Table 1 where there are multiple TSPs *prior* to limitations in TTCs. (MOD-029 R4)

These notices are called Notices of Planned Path Limitation. Where BPA has performed a study, the notice states that the TTC study report is available to TSPs for the specific ~~Path~~ path within seven calendar days upon request to nercatcstandards@bpa.gov with **TTC Study Report Request** in the subject line. Use the **TTC Study Report Request Form** found on BPA's ATC Methodology website ~~shown below~~ to submit the request.

~~https://www.bpa.gov/transmission/Doing%20Business/ATCMethodology/Pages/default.aspx~~

Commented [A21]: Removing web site link to reduce maintenance.

A~~n ATC Path~~ path for which BPA does not perform studies to determine the most current value of TTC is Reno – Alturas NW Sierra (RATS). For RATS, NV Energy determines TTC. The TTC ~~Ratings are~~is provided to BPA and BPA then sends a Notice of Planned Path Limitation. (MOD-029 R3)

Calculating Firm Transmission Service for ~~ATC Path~~Paths

Calculating Firm Existing Transmission Commitments (ETC_F)

When calculating ETC_F for all time periods for its ~~ATC Path~~ paths, BPA uses the following algorithm as specified in MOD-029 R5:

$$ETC_F = NL_F + NITS_F + GF_F + PTP_F + ROR_F + OS_F$$

Where:

NL_F is the firm capacity set aside to serve peak Native Load forecast commitments for the time period being calculated, to include losses, and Native Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

BPA does not have any NL_F, and thus sets NL_F at zero for all of its ~~ATC Path~~ paths for all time periods. All of BPA's firm Transmission obligations are captured in the $NITS_F$, PTP_F, GF_F and ROR_F components of the ETC_F algorithm.

NITS$_F$ is the firm capacity reserved for Network Integration Transmission Service serving Load, to include losses, and Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

For BPA's 1:1 ~~ATC Path~~ paths where NITS$_F$ commitments exist to serve Network Load outside BPA's BAA, the firm capacity set aside for NITS$_F$ is equal to the Load forecast, which includes losses and Load growth, minus generation outside BPA's BAA that is designated to serve that Load. For BPA's 1:1 ~~ATC Path~~ paths where NITS$_F$ commitments exist to serve Network Load inside BPA's BAA from a forecasted or designated network resource that impacts the ~~ATC Path~~ path, the firm capacity set aside for NITS$_F$ is equal to the amount the resource is forecasted/designated for.

For BPA's flow-based ~~ATC Path~~ paths, BPA accounts for NITS$_F$ obligations with a combination of base ETC and interim ETC calculations, as described further in this document.

GF$_F$ is the firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff."

The amount of GF$_F$ BPA sets aside across its 1:1 ~~ATC Path~~ paths is based on the terms of each individual contract.

For BPA's flow-based ~~ATC Path~~ paths, BPA accounts for GF$_F$ obligations with base ETC calculations, as described further in this document.

PTP$_F$ is the firm capacity reserved for confirmed Point-to-Point Transmission Service.

In BPA's calculations for 1:1 ~~ATC Path~~ paths, PTP$_F$ is equal to the sum of the MW Demands of PTP$_F$ reservations or schedules.

For BPA's flow-based ~~ATC Path~~ paths, BPA accounts for PTP$_F$ obligations with a combination of base ETC and interim ETC calculations, as described further in this document.

For Redirects from conditional short-term firm parent reservations, BPA's ETC accounts for the parent reservation until the Redirect is confirmed on OASIS. Once the Redirect is confirmed, BPA's ETC only accounts for the Redirect.

For Redirects from long-term firm parent reservations or unconditional short-term firm parent reservations, BPA's ETC accounts for both the parent reservation and the Redirect reservation until the Redirect itself is unconditional. Once the Redirect is unconditional, BPA's ETC only accounts for the Redirect.

In some cases, BPA has PTP$_F$ contracts that give customers the right to schedule between multiple Points of Receipt (PORs) and Points of Delivery (PODs). However, the customer can only schedule up to the MW amount specified in their contract. Multiple reservations are created for these special cases to allow BPA to model each POR-to-POD combination. The amount set aside for these cases does not exceed the total PTP$_F$ rights specified in the contracts.

ROR_F is the firm capacity reserved for roll-over rights for contracts granting Transmission Customers the right of first refusal to take or continue to take Transmission Service when the Transmission Customer's Transmission Service contract expires or is eligible for renewal.

BPA assumes that all of its Transmission Service Agreements eligible to roll-over in the future will be rolled over. If a Transmission Customer chooses not to exercise its roll-over rights by the required deadline, BPA no longer holds out capacity for roll-over rights for that Transmission Customer.

OS_F is the firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using Firm Transmission Service as specified in the ATCID.

BPA has no OS_F and thus sets OS_F at zero for all of its ~~ATC Path~~ paths for all time periods. All of BPA's firm Transmission obligations are captured in the $NITS_F$, PTP_F, GF_F and ROR_F components of the ETC_F algorithm.

Although BPA uses the above algorithm to calculate ETC_F for all of its ~~ATC Path~~ paths, BPA's ETC_F calculation methodology differs between its 1:1 and ~~Flow~~flow-based ~~ATC Path~~ paths. For 1:1 ~~ATC Path~~ paths, BPA calculates ETC_F by assuming that 1 MW of reserved firm capacity equals 1 MW of ETC_F across that ~~ATC Path~~ path. For the ~~Flow~~flow-based ~~ATC Path~~ paths, BPA calculates ETC_F by summing the base ETC from power-flow ETC studies with interim ETC_F calculated using ~~Power Transfer Distribution Factors~~PTDFs.

Determining base ETC for Flow-Based ~~ATC Path~~Paths

Use of WECC Base Cases to Determine Base ETC

BPA uses the WECC seasonal base cases and modifies them to calculate the base ETC for its flow-based ~~ATC Path~~ paths. BPA refers to these base cases as ETC Cases.

~~The WECC base cases include generation and Transmission expected to be in service or available for service for the time period studied. The WECC base cases reflect input from the WECC Significant Additions Report, which details retirements and new additions, including those from other TSPs. BPA models new Transmission additions for its own System in the WECC base cases as out of service until the energization date is within 0-16 days out, which is the time period BPA has determined to provide enough certainty about the date of energization.~~

~~The WECC base cases that BPA uses meet the following criteria:~~

~~The WECC base cases include generator data in the power flow with generation maximum (Pmax) reflecting the capability of the units. Under no circumstances is Pmax greater than the maximum capability of the unit. BPA always uses the power flow (Pgen) or optimal output of the generator at or within the Pmax and Pmin Ratings for generators that are in service. Within each base case, the individual Generator Owners are identified by numeric code.~~

~~The WECC base cases model the entire Western Interconnection, including AC Transmission Lines 115kV and above and all DC Transmission Lines. Significant looped Transmission Lines rated at less than 115 kV are also included in the WECC base cases.~~

Commented [A22]: Originally included due to MOD-030 R5.2; language pertains to WECC's base cases and not BPA's processes in calculating ST ATC. BPA recommends deleting this language.

Commented [A23]: Originally included due to MOD-030 R3; language pertains to WECC's base bases and not BPA's processes in calculating ST ATC. BPA recommends deleting this language.

Commented [A24]: Originally included due to MOD-030 R3; language pertains to WECC's base cases and not BPA's processes in calculating ST ATC. BPA recommends deleting this language.

Determining Base ETC for Heavy Load Base Cases

BPA creates monthly heavy load ETC Cases to calculate base ETC values. BPA's ETC ~~C~~cases are produced using a power flow model that computes how much power will flow over each flow-based ~~ATC Path~~ path for the assumed Load and generation levels for each time period studied. Counterflows are inherently modeled in these base cases.

BPA uses the following assumptions to create heavy load ETC Cases for its base ETC calculations:

System topology: Normal operating conditions are used. BPA uses the WECC Winter seasonal case for its November through March ETC base cases, the WECC Spring seasonal case for its April and May ETC base cases, and the WECC Summer seasonal case for its June through October ETC base cases.

Load: BPA uses Loads contained in the WECC seasonal base cases for the time periods being studied, along with any updates to those Loads BPA may have made after the WECC base cases were received from WECC.

- **$NITS_F$, PTP_F** and **GF_F**: BPA assumes a 1-in-2 year monthly heavy load forecast in all its monthly ETC cases

Generation: For the generators in BPA's Balancing Authority or directly interconnected to BPA, BPA uses the following generation assumptions:

FCRPS: For the FCRPS resources serving $NITS_F$, PTP_F, and GF_F Long-Term Reservations, generation levels are set using a multiple-step process. For all time periods studied, BPA uses the following process:

- The Columbia Generating Station is assumed to be on-line at full Load in the ETC cases. Generation levels at the Libby, Hungry Horse, Dworshak, and Albeni Falls projects are set based on the requirements set forth in the 2000 Biological Opinion. For March through May ETC cases, the generation levels at the Willamette Valley projects[5] are set at the minimum levels seen by season during Calendar Year 2001. For the June through February ETC cases, the generation levels at the Willamette Valley projects are set at a monthly fleet-aggregate lower 10th percentile of Heavy Load Hour block generation from the planning period of record and adjusted as needed to accurately reflect operations that BPA knows are in place. BPA is transitioning the modeling of the Willamette Valley projects in its ETC cases to this latter method. **Nameplate Adjusted Method:** When creating heavy load ETC Cases, generation levels for all other federal hydro projects[6] are set 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. Then multiple generation scenarios are modelled by stressing one of three different "zones" of Federal hydro resources to the nameplate adjusted 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. ~~This overall method for modeling the federal resources is referred to as the Nameplate Adjusted Method.~~

Commented [A25]: Duplicative language, already covered in line 608.

Non-Federal Thermal Generators: Non-federal thermal generators associated with PTP_F, GF_F and $NITS_F$ Transmission Service for BPA's area and all adjacent TSP areas are set at up to the contract Demand.

Wind Generators:

- **PTP_F:** Wind generators associated with PTP_F Long-Term Reservations are set at ~~the greater of~~ the following depending on the scenarios being run:
  - Modeled on at 100 percent of the contract demand for the wind generator; or
  - Modeled off ~~and replaced by the "Balancing Logic Method".~~

[5] Willamette Valley projects include: Big Cliff, Cougar, Detroit, Dexter, Foster, Green Peter, Hills Creek, Lookout Point, and Lost Creek.

[6] Federal hydro projects include: Grand Coulee, Chief Joseph, Lower Granite, Lower Monumental, Little Goose, Ice Harbor, McNary, John Day, The Dalles, Bonneville.

- **NITS$_F$:** The flow-based ~~ATC Path~~ path impacts of wind generators identified as designated network resources in NITS$_F$ contracts or in the NT Resources Memorandum of Agreement in BPA's area are determined on a flow-based ~~ATC Path~~ path-by-flow-based ~~ATC Path~~ path basis and set at the greater of the following:
  - The wind generators modeled on at the designated amount of the wind generators; or,
  - The wind generators modeled off and replaced by increasing the FCRPS generation level by the designated amount of the wind generators using the ~~"~~Nameplate Adjusted Method~~"~~ for all ETC cases described above.

  Wind generators designated as network resources in NITS$_F$ contracts for all adjacent TSPs are modeled up to the designated amount.
- **GF$_F$:** BPA and all of BPA's adjacent TSPs have no GF$_F$ contracts for wind generators.

Behind the Meter Generators: Non-federal resources that do not require Transmission Service over the FCRTS and that are behind the meter are set up to levels used in BPA's process for power system planning studies.

Mid-Columbia Hydro Projects: Generation levels at the non-federal Mid-Columbia hydro projects are set up to 90 percent of their historical output by season.

When creating heavy load ETC ~~Cases~~cases, if there is more generation than load plus committed exports in the base case, BPA reduces all excess generation pro rata, except for the stressed FCRPS zone~~, using the "Balancing Logic Method";~~ The generation reduction is done to bring generation and load into balance in order to solve the power flow model.

When creating heavy load ETC cases, if there is more load and committed exports than generation in the ETC base case, BPA reduces exports on the COI and Pacific DC Intertie in the ETC base case. This is done to solve the power flow model.

~~the exports modeled on the COI and Pacific DC Intertie in the base case are reduced to match BPA's obligation for firm export. The generation reduction is done to bring generation and load into balance in order to solve the power flow model.~~

Commented [A26]: Rewording for clarity

Sensitivity Studies for Heavy Load Base Cases

In calculating its base ETC values, BPA runs ETC ~~C~~case ~~s~~Scenarios for three different sensitivities: the Canadian Entitlement Return (CER) obligation modeled on or off, wind resources designated to serve PTP$_F$ and NITS$_F$ on or off, and stressing the three different zones of the FCRPS.

For the FCRPS scenarios, the three "zones" that are stressed individually in the scenarios are made up of the following projects: (i) Upper Columbia zone includes Grand Coulee and Chief Joseph; (ii) Lower Snake zone includes Lower Monumental, Lower Granite, Little Goose, and Ice Harbor; and (iii) Lower Columbia zone includes McNary, John Day, The Dalles and Bonneville.

For the CER Scenarios, BPA models the FCRPS generators delivering or not delivering energy to Canada in the amount specified in the Canadian Entitlement Agreement (CER).

In the ~~case where BPA models the FCRPS generators delivering energy to Canada~~ CER on scenarios, BPA models the exports to Canada at the Canadian Entitlement Agreement contract level. ~~for the CER and the~~ The FCRPS generation ~~level~~ is modeled using the ~~"~~Nameplate Adjusted Method.~~"~~ ~~are increased by the amount specified in the Canadian Entitlement Agreement.~~

In the ~~case where BPA models the FCRPS generators not delivering energy to Canada~~ CER off scenarios, BPA models imports from ~~exports to~~ Canada ~~for the CER and~~ at the contract rights that customers have across the Northern Intertie N>S. The FCRPS generation ~~levels using~~ is also modeled using the ~~"~~Nameplate Adjusted Method.~~"~~ ~~are reduced by the MW amount specified in the Canadian Entitlement Agreement.~~

Commented [A27]: Rewording for clarity

For the wind resource scenarios, see above for a description of the base ETC assumptions for wind generators serving PTP_F and $NITS_F$.

Therefore, in its heavy load base ETC sensitivity analysis, BPA models the following 6 scenarios:

1. Wind modeled off/Upper Columbia stressed
2. Wind modeled off/Lower Snake stressed
3. Wind modeled off/Lower Columbia stressed
4. Wind modeled on/Upper Columbia stressed
5. Wind modeled on/Lower Snake stressed
6. Wind modeled on/Lower Columbia stressed

All scenarios are run for (i) April, May, June, July, August, September, October, November, December, January and February with CER modeled off and (ii) all months with CER modeled on.

BPA uses the highest base ETC value calculated from these scenarios in its firm ATC calculations across the flow-based ~~ATC Path~~ paths. BPA uses the lowest base ETC value from these scenarios in its non-firm ATC calculations across the flow-based ~~ATC Path~~ paths.

Determining Base ETC and Sensitivities for Light Load Base Cases

BPA uses the WECC Winter seasonal light load case as the starting point for its Winter seasonal light load ETC base case. The ETC from this case is used as the base ETC for the months of November through March.

BPA uses the WECC Summer seasonal light load case as the starting point for its Summer light load ETC base case. The ETC from the Summer case is used as the base ETC for the months of ~~April~~ June through October.

If a WECC Spring seasonal light load case is available, BPA uses that case as the starting point for its Spring seasonal light load ETC base case. The ETC from this case is used as the base ETC for the months of April in May. If the WECC Spring seasonal light load case is not available, the higher of the base ETCs from either the Winter or Summer case are used as the base ETC for April and May.

Commented [A28]: Language added to reflect process change discussed at the December 16, 2020 customer meeting. Change is implemented and language in ATCID is being caught up to reflect the new process.

BPA uses the following assumptions in light load ETC base cases:

a. System topology: Normal operating conditions are used.
b. Loads: Loads from the WECC light load cases are used. Beginning with the Winter 2022 seasonal case and for Montana loads only, BPA compares the loads in the WECC seasonal light load case with the seasonal light loads supplied by Montana Power, and uses the lowest of the two values in order to properly stress the light load case.
c. Generation: BPA uses generation assumptions from historical data. Canadian Entitlement is modeled as delivering energy to Canada in the amount specified in the Canadian Entitlement Agreement.

There are two sensitivity studies performed for the light load ETC base cases:

a. Federal generation east of the path is increased, and a corresponding amount of federal generation west of the path is reduced
b. Federal generation east of the path is reduced, and a corresponding amount of federal generation west of the path is increased

BPA uses the highest base ETC value calculated from these scenarios in its firm ATC calculations across the flow-based ~~ATC Path~~ paths where light load cases are utilized. BPA uses the lowest base ETC value from these scenarios in its non-firm ATC calculations across the flow-based ~~ATC Path~~ paths where light load cases are utilized.

Calculating Interim ETC_F for Flow-based ~~ATC Path~~Paths

To calculate the impacts for all $NITS_F$ and PTP_F reservations that were not modeled in the base ETC cases, BPA uses PTDF analysis on the demand in each reservation. PTDF analysis is the fraction of energy (expressed as a percentage or as a decimal) that will flow across BPA's monitored flow-based ~~ATC Path~~ paths as that energy is injected at a POR (or source) relative to a slack bus, and withdrawn at a POD (or sink) relative to a slack bus, for each flow-based ~~ATC Path~~ path.

PTDF impacts are calculated as per BPA's Transmission Service Requests Evaluation business practice. If a reservation's impact on a flow-based ~~ATC Path~~ path is determined to be *de minimis* per the Transmission Service Requests Evaluation business practice, then BPA deems the impact of the reservation to be zero when calculating ETC_F.

The sum of these positive impacts is referred to as the interim ETC_F value, and is added to the base ETC values to produce a final ETC_F value for each time period for each flow-based ~~ATC Path~~ path.

Outages in PTDF Calculations

BPA calculates PTDFs by adjusting the WECC base cases to include transmission outages in BPA's outage system for BPA's area and any adjacent TSP areas. Note that BPA has no executed coordination Agreements with other TSPs. (MOD-001 R3.6)

Outage Criteria in ETC Calculations

BPA uses the outage planning timeline described in the "Outages" section. The following criteria determine which outages are incorporated into BPA's hourly, daily and monthly ETC calculations: (MOD-001 R3.6)

Hourly ETC Calculations

For its hourly ETC calculations, BPA uses hourly PTDFs published at least once per day. Transmission outages for Transmission Lines, sections of Transmission Lines, transformers and taps are used to set branches as *open* in the appropriate base case for the hour being calculated.

Daily ETC Calculations

For its daily ETC calculations, BPA uses the most recent PTDFs published for the hour ending 11 of each day, since hour ending 11 tends to have the highest coincidence of outages. Therefore all Transmission outages scheduled to occur during the hour ending 11, regardless of the duration of the outage, impact daily ETC calculations. (MOD-001 R3.6.1)

BPA includes Transmission outages in daily ETC calculations beyond the 10- to 16-day planned outage study period if the outage is officially scheduled in BPA's outage system.

Monthly ETC Calculations

For its monthly ETC calculations, BPA uses the most recent daily PTDFs published for the first Tuesday of that month. BPA includes Transmission outages in monthly ETC calculations beyond the 10- to 16-day planned outage study period if the outage is officially scheduled in BPA's outage system. (MOD-001 R3.6.2)

Source/POR and Sink/POD Identification and Mapping

In the ETC components of its flow-based ~~ATC Path~~ path ATC calculations, BPA accounts for source and sink for Transmission Service through the following processes:

BPA maps the source/POR and sink/POD to the WECC base cases. In this mapping, BPA has assigned network bus points that represent the primary interface for Interconnection with specific generation projects, adjacent electrical Systems or Load-serving entities and trading hubs. Some adjacent electrical Systems have multiple Interconnection points deemed as PORs/sources or PODs/sinks. The mapping of these points is published in the Transmission Service Contract Points list on BPA's OASIS homepage.

~~The source used in BPA's flow-based ATC Path ATC calculations of transactions within BPA's BAA is obtained from the POR field for Short-Term Reservations and the source field for Long-Term Reservations, as shown on the TSR template in OASIS. BPA represents the impact of Transmission Service using the source or POR as follows:~~

~~If the source or POR has been identified in the reservation and is discretely modeled in the WECC base cases, BPA uses the discretely modeled point as the source.~~

~~In cases where the source or POR has been identified in the reservation and the point can be mapped to an "equivalent" or "aggregate" representation in the WECC base cases, BPA maps the source to the equivalence point in the WECC base cases. These points are published in the Transmission Service Contract Points List on BPA's OASIS home page.~~

~~If the source or POR has been identified in the reservation and the point cannot be mapped to a discretely modeled point or an "equivalence" representation in the WECC base cases, BPA uses the immediately adjacent BA associated with the TSP from which the power is to be received as the source.~~

- ~~BPA requires a specified source or POR to be identified for all reservations.~~

~~The sink used in BPA's flow-based ATC Path ATC calculations of transactions within BPA's BAA is obtained from the POD field for Short-Term Reservations and the sink field for Long-Term Reservations, as shown on the TSR template in OASIS. BPA represents the impact of Transmission Service using the sink or POD as follows:~~

~~If the sink or POD has been identified in the reservation and is discretely modeled in the WECC base cases, BPA uses the discretely modeled point as the sink or POD.~~

~~In cases where the sink or POD has been identified in the reservation and the point can be mapped to an "equivalent" or "aggregate" representation in the WECC base case, BPA maps the sink or POD to the equivalence points in the WECC base cases. These points are published in the Transmission Service Contract Points list on BPA's OASIS home page.~~

~~If the sink or POD has been identified in the reservation and the point cannot be mapped to a discretely modeled point or an "equivalence" representation in the WECC base cases, BPA uses the immediately adjacent BA associated with the TSP receiving the power as the sink or POD.~~

~~BPA requires a specified sink or POD to be identified for all reservations.~~

~~BPA has grouped the FCRPS generators in BPA's BAA and the Mid-Columbia generators based on the primary interface between BPA and the generation projects. These groupings are assigned weighted PTDFs that represent how the generators participate in the group. The weighted PTDF for the FCRPS bus point is derived from a "weighted FCRPS" bus point.~~

BPA uses weighted PTDFs in some instances. Weighted PTDFs for Sources/PORs are calculated as follows:

1. The PTDF weighting for ~~this point~~ the FCRPS/BPAPower PTDF varies by time period and path based on stress scenarios. The PTDF weighting is derived from generation forecasts of the federal resources, for calculations for the next hour through

Commented [A29]: Originally included due to MOD-030 R1. This information is now found in the TSR Evaluation business practice and therefore this language is duplicative. BPA recommends deleting this language.

Commented [A30]: The next paragraphs were included due to MOD-030 R4. This language was largely lifted out of R4 and does not add much clarity about BPA's mapping process. BPA recommends deleting this language.

Commented [A31]: Originally included due to MOD-030 R1. This information is now found in the TSR Evaluation business practice and therefore this language is duplicative. BPA recommends deleting this language.

Commented [A32]: The next paragraphs were included due to MOD-030 R4. This language was largely lifted out of R4 and does not add much clarity about BPA's mapping process. BPA recommends deleting this language.

Commented [A33]: Incorporated into section on weighted PTDFs directly below.

approximately two weeks. Beyond this time frame, BPA derives the weighting of the PTDF by applying the generation dispatch determined in the ETC Cases.

~~1.~~2. BPA derives the PTDF weighting for the Mid-Columbia bus point by applying the generation dispatch determined in the ETC Cases.

3. BPA has grouped the generators in its adjacent BAAs based on the primary interface between each BAA and the generation projects within that BAA (excluding some remote generators that are scheduled via NERC e-Tag). These groupings are assigned weighted PTDFs that represent how the generators participate in the group and are used to evaluate transactions within and between adjacent BAAs that do not include BPAT. BPA derives the PTDF weightings for these points from BAA-provided generation estimates or by applying the generation dispatch determined in the ETC Cases if generation estimates are not available. In the ETC Cases, these generators are modeled up to the long-term firm Transmission rights associated with the generators.

Weighted PTDFs for Sinks/PODs are calculated as follows:

1. BPA has weighted PTDFs for loads in its adjacent BAAs based on the primary interface between each BAA and the load within that BAA. The weighting is based on how the load is distributed in the BAA.

~~1.~~ BPA also calculates a weighted PTDF to account for unscheduled NT loads in BPA's BA that are served from the FCRPS. The weighting is based on the individual load forecasts for the time period being calculated.

2.

Calculating Firm Available Transfer Capability (ATC_F)

When calculating ATC_F for its ~~ATC Path~~ paths for all time periods, BPA uses the following algorithm (MOD-029 R7):

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

Where:

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

For ATC_F calculations for all time periods, BPA divides ETC_F into the following variables within its ATC software:

$$ETC_F = LRES + SRES + LETC - SADJ/ETC\ Adjustments$$

Where:

LRES is the sum of positive impacts of BPA's Long-Term Reservations.

SRES is the sum of positive impacts of BPA's Short-Term Reservations.

LETC is used to ensure that the amount of $NITS_F$, GF_F, PTP_F and ROR_F capacity BPA sets aside in the LRES variable for contracts where BPA gives customers the right to schedule the capacity reserved between multiple PORs and PODs does not exceed the total capacity specified in those contracts.

LETC is also used to align the ETC calculated in the power flow base case with additional PTDF calculations in order to balance to the standard OATI calculation. This adjustment is derived by comparing two values: a) the impacts of the confirmed PTP_F, GF_F, $NITS_F$ and ROR_F Long-Term Reservations derived from the base ETC Cases and b) the impacts of the same reservations calculated using PTDF Analysis for each flow-based ~~ATC Path~~ path. The adjustment for each flow-based ~~ATC Path~~ path is equal to the difference of these two values. Conditional firm reservations are not included in the ETC Cases and therefore are also not included in this comparison.

SADJ/ETC Adjustments is the variable BPA uses to make adjustments to ETC_F not captured in LRES or SRES.

BPA applies one such adjustment to allow for deferral competitions, as required in Section 17.7 of BPA's OATT. When a deferral reservation is confirmed, BPA applies an SADJ/ETC Adjustment to hold out capacity for the time period deferred, starting at the latter of five months out or the service commencement date of the original reservation, to allow for a competition. At four months out, if no competition is identified, the SADJ/ETC Adjustment is modified to release the capacity for the fourth month out.

BPA uses a SADJ/ETC Adjustment to account for a portion of the firm TRM that BPA applies on the NI S>N.

BPA also uses SADJ/ETC Adjustments to ensure accurate accounting of ETC_F. These adjustments may be performed to account for situations such as data modeling corrections, and are noted in the descriptions of the adjustments.

The following diagram illustrates how the variables in BPA's ATC software correspond to the variables in the ETC_F algorithm.

ETC_F =	$NITS_F$	+	GF_F	+	PTP_F	+	ROR_F
	↓		↓		↓		↓
	LRES		LRES		LRES		LRES
	+				+		
	SRES				SRES		
	+		+		+		+
	LETC		LETC		LETC		LETC
	-		-		-		-

	SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments

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

BPA does not maintain CBM and thus sets CBM at zero for all of its ~~ATC Path~~ paths for all time periods.

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

The description of how BPA implements TRM can be found in BPA's TRMID, which is posted on BPAs website.

Postbacks$_F$ 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.

BPA automatically recalculates ETC_F to account for changes to Transmission Service Requests (such as request types of Recall and Redirect and annulments). Since these types of changes to Transmission Service Requests are captured in ETC_F, BPA sets Postbacks$_F$ at zero for all time periods when calculating ATC_F.

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

BPA does not include confirmed Transmission reservations, expected interchange or internal flow counter to the direction of the ~~ATC Path~~ path being calculated in its ATC_F calculations. BPA's rationale is that it does not want to offer firm ATC due to counterflow that may not be scheduled as this could lead to curtailments of Firm Transmission Service in the Real-time horizon. (MOD-001 R3.2) Therefore BPA sets Counterflows$_F$ at zero for all of its ~~ATC Path~~ paths for all time periods.

For flow-based ~~ATC Path~~ paths, counterflows are automatically modeled in the base ETC cases. In instances where the power flow study results in a negative base ETC value, BPA uses zero as the base ETC for purposes of calculating ATC_F. This is done to ensure that BPA does not make capacity available as a result of counterflows that may or may not materialize in real-time.

Calculating Non-Firm Transmission Service for BPA's ~~ATC Path~~Paths

BPA sells six non-firm Transmission products. Those products are:

1. **NITS$_{NF6}$**. This is a non-firm Transmission product available only to Transmission Customers with NITS Agreements. It is the highest quality of Non-Firm Transmission Service in that it is the last Non-Firm Transmission Service that would be Curtailed, if necessary.

2. **PTP$_{NF5}$**. This is a non-firm Transmission product available only to Transmission Customers with PTP service Agreements. PTP$_{NF5}$ is the fifth Non-Firm Transmission Service that would be Curtailed, if necessary.

3. **PTP_{NF4}.** This is a non-firm Transmission product available only to Transmission Customers with PTP service Agreements. PTP_{NF4} is the fourth Non-Firm Transmission Service that would be Curtailed, if necessary.

4. **PTP_{NF3}.** This is a non-firm Transmission product available only to Transmission Customers with PTP service Agreements. PTP_{NF3} is the third Non-Firm Transmission Service that would be Curtailed, if necessary.

5. **PTP_{NF2}.** This is a non-firm Transmission product available only to Transmission Customers with PTP service Agreements. PTP_{NF2} is the second Non-Firm Transmission Service that would be Curtailed, if necessary.

6. **PTP_{NF1}.** This is a non-firm Transmission product available only to Transmission Customers with PTP service Agreements. PTP_{NF1} is the first Non-Firm Transmission Service that would be Curtailed, if necessary (this Transmission Service has the highest likelihood of being Curtailed).

BPA calculates ETC_{NF} and ATC_{NF} for each of these products.

Calculating Non-Firm Existing Transmission Commitments (ETC_{NF})

BPA calculates ETC_{NF} for all time periods for a~~n ATC Path~~ path using the following algorithm as specified in MOD-029 R6:

$$\mathbf{ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}}$$

Where:

$NITS_{NF}$ is the non-firm capacity set aside for Network Integration Transmission Service serving Load (i.e., secondary service), to include losses, and Load growth not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.

In BPA's calculations, this is comprised of the $NITS_{NF6}$ Transmission product. BPA's $NITS_{NF6}$ calculation does not include losses or Load growth, since losses and Load growth are already set aside as firm capacity in $NITS_F$.

GF_{NF} is the non-firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff".

BPA does not have any grandfathered non-firm Transmission Service obligations and thus sets GF_{NF} at zero for all of its ~~ATC Path~~ paths for all time periods.

PTP_{NF} is non-firm capacity reserved for confirmed Point-to-Point Transmission Service.

In BPA's calculations, PTP_{NF} includes the PTP_{NF5}, PTP_{NF4}, PTP_{NF3}, PTP_{NF2} and PTP_{NF1} Transmission products.

OS_{NF} is the non-firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using non-firm transmission service as specified in the ATCID.

BPA has no OS_{NF} and thus sets OS_{NF} at zero for all of its ~~ATC Path~~ paths for all time periods.

ETC_{NF} for 1:1 ~~ATC Path~~ paths is calculated by assuming that 1 MW of reserved and/or scheduled capacity results in 1 MW of impact across the 1:1 ~~ATC Path~~ path.

When calculating ETC_{NF} for flow-based ~~ATC Path~~ paths, BPA sums the positive impacts of reservations and/or schedules as determined by PTDF analysis, per BPA's Transmission Service Requests Evaluation business practice. When calculating ETC_{NF} for flow-based ~~ATC Path~~ paths when using reservations, BPA deems *de minimis* impacts of the reservations to be zero. However, when calculating ETC_{NF} for flow-based ~~ATC Path~~ paths when using schedules, all impacts are accounted for in ETC_{NF}, regardless of whether their PTDF analysis impact is deemed to be *de minimis* or not.

Calculating Non-Firm Available Transfer Capability (ATC_{NF})

BPA uses two time horizons when calculating ATC_{NF} for all of its ~~ATC Path~~ paths: Real-time and Beyond Real-time. The Real-time horizon begins at 10 p.m. each day for the 24 hours in the next day. ETC_F and ETC_{NF} for the Real-Time horizon are calculated using schedules and reservations that have not yet been scheduled. The beyond Real-time horizon includes hourly for the hours after those included in the Real-time period as well as daily and monthly calculations. ETC_F and ETC_{NF} for the time horizon beyond Real-time are calculated using reservations.

BPA calculates ETC_{NF} and ATC_{NF} for the six non-firm Transmission products associated with NERC Curtailment priorities as follows:

1. **ATC_{NF6}**: ATC_{NF6} is calculated using an ETC_{NF} that only includes the $NITS_{NF6}$ transmission product.

2. **ATC_{NF5}**: ATC_{NF5} is calculated using an ETC_{NF} that includes the $NITS_{NF6}$ and PTP_{NF5} transmission products.

3. **ATC_{NF4}**: ATC_{NF4} is calculated using an ETC_{NF} that includes the $NITS_{NF6}$, PTP_{NF5} and PTP_{NF4} transmission products.

4. **ATC_{NF3}**: ATC_{NF3} is calculated using an ETC_{NF} that includes the $NITS_{NF6}$, PTP_{NF5}, PTP_{NF4}, and PTP_{NF3} transmission products.

5. **ATC_{NF2}**: ATC_{NF2} is calculated using an ETC_{NF} that includes the $NITS_{NF6}$, PTP_{NF5}, PTP_{NF4}, PTP_{NF3} and PTP_{NF2} transmission products.

6. **ATC_{NF1}**: ATC_{NF1} is calculated using an ETC_{NF} that includes the $NITS_{NF6}$, PTP_{NF5}, PTP_{NF4}, PTP_{NF3}, PTP_{NF2} and PTP_{NF1} transmission products.

When calculating ATC_{NF} for its ~~ATC path~~ paths for the real-time and beyond real-time horizons, BPA uses the following algorithm as specified in MOD-029 R8:

$$\mathbf{ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_S - TRM_U + Postbacks_{NF} + Counterflow_{NF}}$$

Where:

ATC_{NF} is the non-firm Available Transfer Capability for the ATC Path for that period.

BPA calculates six ATC_{NF} values as described above.

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

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

The section below outlines how BPA calculates ETC_F for all of its ~~ATC Path~~ paths for the beyond Real-time and the Real-time horizons.

ETC_F for the Beyond Real-Time Horizon

For ATC_{NF} calculations for the beyond Real-time horizon, BPA utilizes the following variables within its ATC software to calculate ETC_F:

ETC_F = LRES + SRES - SADJ/ETC Adjustments + NFETC

Where:

LRES is the sum of positive impacts of BPA's Long-Term Reservations.

SRES is the sum of positive impacts of BPA's Short-Term Reservations.

SADJ/ETC Adjustments is the variable used to make adjustments to ETC_F not captured in LRES or SRES.

BPA applies one such adjustment to allow for deferral competitions, as required in Section 17.7 of BPA's OATT. When a deferral reservation is confirmed, BPA applies a SADJ/ETC Adjustment to hold out capacity for the time period deferred, starting at the latter of five months out or the service commencement date of the original reservation, to allow for a competition. At four months out, if no competition is identified, the SADJ/ETC Adjustment is modified to add back capacity for the fourth month out.

BPA uses SADJ/ETC Adjustments to ensure accurate accounting of ETC_F. These adjustments may be performed to account for situations such as data modeling corrections, and are noted in the descriptions of the adjustments.

NFETC is used to ensure that the amount of $NITS_F$, GF_F, PTP_F and ROR_F capacity BPA sets aside in the LRES variable for contracts where BPA gives customers the right to schedule the capacity reserved between multiple PORs and PODs does not exceed the total capacity specified in those contracts.

NFETC is also used to align the ETC calculated in the power flow base case along with additional PTDF calculations in order to balance to the standard OATI calculation.

This adjustment is derived by comparing two values: a) the impacts of the PTP_F, GF_F and $NITS_F$ Long-Term Reservations derived from the base ETC Cases and b) the impacts of the same reservations calculated using PTDF Analysis for each flow-based ~~ATC Path~~ path. The adjustment for each flow-based ~~ATC Path~~ path is equal to the difference of these two values. Conditional firm reservations are not included in the ETC Cases and therefore are also not included in this comparison.

The following diagram illustrates how the variables in BPA's ATC software correspond to the variables in the ETC_F algorithm for the Beyond Real-time horizon.

ETC_F =	$NITS_F$	+	GF_F	+	PTP_F	+	ROR_F
	↓		↓		↓		↓
	LRES		LRES		LRES		LRES
	+				+		
	SRES				SRES		
	+		+		+		+
	NFETC		NFETC		NFETC		NFETC
	-		-		-		-
	SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments

ETC_F for the Real-Time Horizon

For ATC_{NF} calculations for the Real-time horizon, BPA divides ETC_F into the following variables within its ATC software:

$$ETC_F = SCH^+_7 + ASC^+_7 + RADJ/ETC\ Adjustment$$

Where:

SCH^+_7 is the sum of the positive impacts of schedules that reference confirmed $NITS_F$, GF_F and PTP_F reservations for the ATC Path for that period. The energy profile of the schedule is used except for the schedule types of Dynamic, Capacity and Pseudo-tie.

ASC^+_7 is the sum of the positive impacts of dynamic schedules that reference confirmed $NITS_F$, GF_F and PTP_F reservations for the ATC Path for that period. The transmission profile of the schedule is used for the schedule types of Dynamic, Capacity and Pseudo-tie.

RADJ/ETC Adjustment: BPA uses RADJ/ETC adjustments to ensure accurate accounting of ETC_F. These adjustments may be performed to account for situations such as data modeling corrections.

The following diagram illustrates how the variables in BPA's ATC software correspond to the variables in the ETC_F algorithm for the Real-time horizon. ROR_F is not included in ETC_F for the Real-time horizon because ROR_F is not relevant for the Real-time horizon.

ETC_F =	$NITS_F$	+	GF_F	+	PTP_F
	↓		↓		↓
	SCH^+_7		SCH^+_7		SCH^+_7
	+		+		+
	ASC^+_7		ASC^+_7		ASC^+_7
	+		+		+
	RADJ/ETC Adjustment		RADJ/ETC Adjustment		RADJ/ETC Adjustment

ETC_{NF} is the sum of existing non-firm commitments for the ATC Path during that period.

The section below outlines how BPA calculates ETC_{NF} for all of its ~~ATC Path~~ paths for the beyond Real-time and the Real-time horizons.

ETC_{NF} for the Beyond Real-Time Horizon

For ATC_{NF} calculations for the beyond Real-time horizon, ETC_{NF} is reflected as the following variable within BPA's ATC software:

$$ETC_{NF} = RRES_{6,5,4,3,2,1}$$

Where:

$RRES_{6,5,4,3,2,1}$ is the sum of the positive impacts of all confirmed $NITS_{NF6}$, PTP_{NF5}, PTP_{NF4}, PTP_{NF3}, PTP_{NF2} and PTP_{NF1} reservations.

The following diagram illustrates how the variables in BPA's ATC software correspond to the variables in the ETC_{NF} algorithm for the Beyond Real-time horizon.

ETC_{NF} =	$NITS_{NF}$	+	PTP_{NF}
	↓		↓
	$RRES_6$		$RRES_{5,4,3,2,1}$

ETC_{NF} for the Real-Time Horizon

For ATC_{NF} calculations in the Real-time horizon, ETC_{NF} is reflected as the following variables within BPA's ATC software:

$$ETC_{NF} = SCH^+_{6,5,4,3,2,1} + ASC^+_{6,5,4,3,2,1}$$

Where:

$SCH^{+}_{6,5,4,3,2,1}$ is the sum of the positive impacts of schedules referenced to confirmed $NITS_{NF6}$, $PTP_{NF5,}$ $PTP_{NF4,}$ $PTP_{NF3,}$ PTP_{NF2} and PTP_{NF1} reservations, plus the sum of the positive impacts of confirmed $NITS_{NF6}$, $PTP_{NF5,}$ $PTP_{NF4,}$ $PTP_{NF3,}$ PTP_{NF2} and PTP_{NF1} reservations that have not yet been scheduled. Once these reservations are scheduled, the schedule is used for ETC_{NF}, thereby adding back the difference between the reservation and schedule amounts to ATC_{NF}. The energy profile of the schedule is used except for the schedule types of Dynamic, Capacity and Pseudo-tie.

$ASC^{+}_{6,5,4,3,2,1}$ is the sum of positive impacts of dynamic schedules referenced to confirmed $NITS_{NF6}$, $PTP_{NF5,}$ $PTP_{NF4,}$ $PTP_{NF3,}$ PTP_{NF2} and PTP_{NF1} reservations, plus the sum of the positive impacts of confirmed $NITS_{NF6}$, $PTP_{NF5,}$ $PTP_{NF4,}$ $PTP_{NF3,}$ PTP_{NF2} and PTP_{NF1} reservations that have not yet been scheduled. Once these reservations are scheduled, the schedule is used for ETC_{NF}, thereby adding back the difference between the reservation and schedule amounts to ATC_{NF}. The transmission profile of the schedule is used for the schedule types of Dynamic, Capacity and Pseudo-tie.

The following diagram illustrates how the variables in BPA's ATC software correspond to the variables in the ETC_{NF} algorithm for the Real-time horizon.

ETC_{NF} =	$NITS_{NF}$	+	PTP_{NF}
	↓		↓
	SCH^{+}_{6}		$SCH^{+}_{5,4,3,2,1}$
	+		+
	ASC^{+}_{6}		$ASC^{+}_{5,4,3,2,1}$

CBM_S is the Capacity Benefit Margin for the ATC Path that has been scheduled during that period.

BPA does not maintain CBM and thus sets CBM_S at zero for all of its ~~ATC Path~~ paths for all time periods.

TRM_U is the Transmission Reliability Margin for the ATC Path that has not been released for sale (unreleased) as non-firm capacity by the Transmission Service Provider during that period.

The description of how BPA implements TRM can be found in BPA's TRMID, which is posted on BPAs website.

$Postbacks_{NF}$ are changes to non-firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.

The section below outlines how BPA calculates $Postbacks_{NF}$ for all of its ~~ATC Path~~ paths for the beyond Real-time and the Real-time horizons.

Postbacks$_{NF}$ for the Beyond Real-time horizon

BPA automatically recalculates ETC$_{NF}$ to account for changes to Transmission Service Requests (such as request types of Recall and annulments) for the Beyond Real-time horizon. Since these types of changes to Transmission Service Requests are captured in ETC$_{NF}$, BPA sets Postbacks$_{NF}$ at zero for this horizon.

Postbacks$_{NF}$ for the Real-time Horizon

BPA automatically recalculates ETC$_{NF}$ to account for changes to Transmission Service Requests (such as request types of Recall and annulments) for the Real-time Horizon. Since these types of changes to Transmission Service Requests are captured in ETC$_{NF}$, BPA sets Postbacks$_{NF}$ at zero for this horizon for all paths with the exception of COI N>S.

For ATC$_{NF}$ calculations for the COI N>S path in the Real-time horizon, BPA uses a Postbacks$_{NF}$, expressed as RADJ/ETC. For its hourly COI N>S non-firm calculations, BPA posts back any unused share of non-firm capacity that is available to BPA by capacity ownership and other Agreements for the COI N>S, if needed to prevent Curtailments.

Counterflow$_{NF}$ are adjustments to non-firm Available Transfer Capability as determined by the Transmission Service Provider and specified in its ATCID.

Since a schedule provides assurance that the transaction will flow, all counterflows resulting from firm and non-firm Transmission schedules, excluding tag types dynamic, pseudo and capacity, are added back to ATC$_{NF}$ in the Counterflows$_{NF}$ component. (MOD-001 R3.2)

In BPA's ATC$_{NF}$ calculations, Counterflows$_{NF}$ is expressed as $SCH^{-}_{7,6,5,4,3,2,1}$, which is the sum of schedules flowing in the direction counter to the direction of the ~~ATC Path~~ path.

Counterflows are modeled in the ETC Cases used to determine ETC$_F$ for BPA's flow-based ~~ATC Path~~ paths. In instances where the power flow study results in a negative base ETC value, BPA uses zero as the base ETC for purposes of calculating ATC$_{NF}$. This is done to ensure that BPA does not make capacity available as a result of counterflows that may or may not materialize in real-time

In some cases, the amount of Counterflows$_{NF}$ exceeds the sum of the ETC$_F$ and ETC$_{NF}$, which, when added to TTC, results in ATC$_{NF}$ greater than TTC.

Note: The variable RADJ/ETC is also used to respond to a BPA dispatcher order to change ATC values by a specified amount and thereby reduce schedules in-hour when the flow exceeds the TTC.

Adjustments to F~~f~~low-based ~~ATC Path~~Path ATC Values

There may be instances where BPA needs to perform testing in the production environment of the systems that manage BPA's ATC calculations. In these instances, BPA may adjust its ATC values across the flow-based ~~ATC Path~~ paths to ensure that Hourly requests are not declined due to lack of ATC across the flow-based paths. BPA will issue a notice to customers with the details prior to performing this testing.

VIII. Data Sources and Recipients

BPA receives data for use in its ATC calculations, and provides data for use in calculating 1:1 and flow-based ~~ATC Path~~ path capabilities through the WECC base case process. BPA also directly receives and provides data, such as outage information and specific Transmission commitments, from and to the following Transmission Service Providers and Transmission Operators: (MOD-001 R3.3, R3.4)

- Avista Corporation
- BC Hydro
- California Independent System Operator
- City of Tacoma, Department of Public Utilities, Light Division
- Eugene Water and Electric Board
- Fortis BC
- Idaho Power Company
- Los Angeles Department of Water and Power
- NV Energy
- NorthWestern Energy
- Pacific Gas & Electric
- PacifiCorp
- Pend Oreille County Public Utility District No. 1
- Portland General Electric
- Public Utility District No. 1 of Chelan County
- Public Utility District No. 1 of Clark County
- Public Utility District No. 1 of Douglas County
- Public Utility District No. 2 of Grant County, Washington
- Public Utility District No. 1 of Snohomish County
- Puget Sound Energy, Inc.
- Sacramento Municipal Utility District
- Seattle City Light
- Southern California Edison
- Transmission Agency of Northern California
- Western Area Power Administration – Sierra Nevada Region
- California Independent System Operator

IX. Responding to Data Requests

Upon official request from any Transmission Service Provider, Planning Coordinator, Reliability Coordinator, or Transmission Operator for any data from the list below, solely for use in the requestor's ATC or AFC calculations, BPA will begin to make the data available within 30 calendar days of receiving the request.

- Expected generation and Transmission outages, additions, and retirements
- Load forecasts
- Unit commitments and order of dispatch, to include all designated resources (BPA does not have resources that are committed or have the legal obligation to run)
- Firm NITS and non-firm NITS (i.e. Secondary Service)
- Firm and non-firm Transmission reservations
- Grandfathered obligations
- Firm roll-over rights
- Any firm and non-firm adjustments applied by BPA to reflect parallel path impacts
- Power flow models and underlying assumptions
- Contingencies, provided in one or more of the following formats:
    - A list of Elements
    - A list of flow-based ~~ATC Path~~ paths
    - A set of selection criteria that can be applied to the WECC base cases used by BPA
- Facility Ratings
- Any other service that impact ETCs
- Values of CBM and TRM for all ~~ATC Path~~ paths
- Values of TTC and ATC for all ~~ATC Path~~ paths
- Source and sink identification and mapping to the WECC base cases

BPA will make this data available on the schedule specified by the requestor (but no more frequently than once per hour, unless mutually agreed to by the requestor and Bonneville).

For a Transmission Service Provider, Planning Coordinator, Reliability Coordinator, or Transmission Operator to officially request data to use in ATC or AFC calculations, the requestor must fill out the **Data Request Form** (MOD-001 R9) found on BPA's ATC Methodology website ~~https://www.bpa.gov/transmission/Doing%20Business/ATCMethodology/Pages/default.aspx~~. The completed request form must be sent to nercatcstandards@bpa.gov with **Data request Form** (MOD-001 R9) in the subject line. (MOD-001 R9)

Commented [A34]: Removing web site link to reduce maintenance.

X. ATCID Revisions

BPA will notify the entities contained in ATCID TP Distribution List when implementing a new or revised ATCID and make its current ATCID available. (MOD-001 R4, R5)

XI. Version History

ATCID Revision History			
Version	**Date Revised**	**Description of Changes**	**Prepared by**

ATCID Revision History			
1.0	03/30/2011	BPA ATCID FINAL	S Long L Trolese C Etheridge
2.0	05/11/2011	P.31 Table 2 BPA Flowgates: Corrected the definition of the West of McNary Flowgate by replacing McNary – Horse Heaven 230 kV line with Harvalum – Big Eddy #1 230 kV line in the West of McNary Flowgate Transmission Line Components	L Trolese
3.0	08/11/2011	P. 7 line 114: Revised frequency of hourly calculations from at least three times per hour to at least once per hour. P. 12-13 Table 1 BPA Paths: Added Montana-Northwest to the Path Name; added Garrison 500 kV 1 and 2 to the Transmission Line Components of the West of Garrison E>W and W>E Paths and revised the Montana Intertie Transmission Line Component from Broadview – Garrison 500 kV 1 and 2 to Townsend-Garrison 500 kV 1 and 2 to be effective October 1, 2011. P. 17 lines 395-397: Revised sentence to include Montana Intertie as an ATC Path that is limited by contract. P. 18 lines 440-445: Revised paragraph to include Montana Intertie as an ATC Path where another TOP sets the TTC. P. 19 line 483-486 and P. 40 line 1102: Added forecasted network resources to be included in Network Integration Transmission Service P. 20 line 517: corrected reference from ETC to ATC_{NF}. P. 20 line 531; P. 22 ETC_F variable diagram, P. 25 line 669, P. 26 ETC_F variable diagram, P. 47 line 1324, P. 49 ETC_F variable diagram, P. 53 line 1493 and P. 54 ETC_F variable diagram: Corrected ETC_F formula to subtract SADJ/ETC Adjustments instead of add it. P. 27 lines 724-726 and P. 55 lines 1549-1551: Updated reason for why ROR_F is not included in the real-time horizon. P. 29 line 789: Deleted “implemented” from which schedules impact counterflows.	L Trolese

ATCID Revision History			
		P. 30 lines 798-800: Added a note describing the variable RADJ/Congestion Management and how it impacts ATC calculations. P. 44: Corrected footnote 7 to align it with the reference. P. 47: Deleted language referring to including adjacent TSP reservations in interim ETC_{Fi}. P. 53 lines 1517-1521: Added paragraph describing LETC that was mistakenly left out in Version 1.0 and 2.0. P. 57 line 1604: Deleted "confirmed" from which schedules impact counterflows. P. 58: Replaced table delineating the NERC registered functions of the entities with a bulleted list of the entities. Appendix A: Updated List of Contracts and Specific Paths with Shared Ownership to indicate the Colstrip Project on the Montana Intertie Path will no longer be represented as an allocation agreement after October 1, 2011. Appendix C: Updated the SOL Methodology. Appendix D: Updated BPA's NITS, GF, and PTP Agreements to include the Colstrip Project and other contracts that have been added since February 3, 2011.	
4.0	09/30/2011	P. 27 lines 720 – 722 and ETC_F variable diagram: added new use for RADJ/ETC Adjustments variable.	L Trolese
5.0	10/20/2011	P. 39 lines 1068-1070, P. 40 lines 1077-1079 and lines 1087-1089: Removed language referring to the month of August. P. 40 lines 1103-1114, P. 41 lines 1118-1128 and P. 48 lines 1325-1331: added paragraph describing how BPA accounts for the impacts of its adjacent TSP firm NITS and PTP Transmission Service.	L Trolese
6.0	11/1/2011	P.31 Table 2 BPA Flowgates: Added the McNary – John Day #2 500 kV line to the West of McNary Flowgate definition. Appendix C: Updated the SOL Methodology.	L Beckman

ATCID Revision History			
7.0	11/10/2011	P. 40 line 1103 and P.41 line 1118: Changed effective date from November 8th to no later than November 15, 2011 for incorporating adjacent TSP TSRs into AFC calculations.	L Beckman
8.0	02/03/2012	P. 35 line 907: Added paragraph describing how BPA prepares for the addition of a flowgate.	L Beckman
9.0	02/13/2012	P. 5, P. 22, P. 29: Defined BPA's TRM practice for the Northern Intertie S>N Path. P. 20 line 528 and P. 23 line 597: Replaced NI Holdout in the ATC_F formula with TRM.	L Beckman
10.0	02/14/2012	P.30-31 Table 2 BPA Flowgates: Corrected the following flowgate definitions: South of Allston Flowgate: replaced Astoria-Seaside 115kV; and Lewis & Clark-Astoria Tap 115kV line with Astoria-Seaside 115kV; and Clatsop 230/115kV line in the South of Allston Flowgate Transmission Line Components. North of John Day Flowgate: replaced Wautoma-John Day 500kV line with Wautoma-Rock Creek 500kV line in the North of John Day Flowgate Transmission Line Components. Cross Cascades North Flowgate: Added the Anderson Canyon-Beverly Park 115 kV line to the Cross Cascades North Flowgate Transmission Line Components. Cross Cascades South Flowgate: replaced Hanford-Ostrander 500kV line with Wautoma-Ostrander 500kV line, replaced McNary-Santiam 230kV line with Jones Canyon-Santiam 230kV line, replaced Parkdale-Troutdale 230kV with Big Eddy-Troutdale 230kV, and added Bethel – Round Butte 230 kV line in the Cross Cascades South Flowgate Transmission Line Components. West of McNary Flowgate: replaced McNary-Santiam 230kV line with Jones Canyon-Santiam 230kV line in the West of McNary Flowgate Transmission Line Components.	L Beckman
11.0	02/22/2012	P. 8 line 166: Removed reference to Northwest Power Pool (NWPP) Outage Coordination Processes, dated 01/29/09.	L Beckman
12.0	03/01/2012	P. 32 Table 2 BPA Flowgates: Added the West of John Day Flowgate and Transmission Line Components. P. 32 Figure 3 BPA Network Flowgate Map: Added the West of John Day Flowgate.	L Beckman
13.0	03/27/2012	P. 31 Table 2 BPA Flowgates: Removed the Anderson Canyon-Beverly Park 115 kV line from the Cross Cascades North Flowgate Transmission Line Components.	L Beckman

ATCID Revision History			
		P. 4 line 52: Moved MOD 008-01 to the Methodologies Selected section.	
14.0	04/11/2012	Appendix A: Updated Portland General Electric's Intertie Agreements to reflect the termination of the AC/DC Exchange Agreement that will be effective on 7/1/2012.	L Beckman
15.0	05/15/2012	P. 38 lines 1013-1015, P. 41 lines 1107-1115, P. 46 lines 1282-1289, P. 50 lines 1402-1407 and P. 50 lines 1422-1427: Moved language regarding the PTDF Analysis impact and percentage used in the Western Interconnection-wide Congestion Management Procedure. P. 40 lines 1084-1093: Added generation estimates as the source of the PTDF weightings. P. 42 lines 1157-1159 and P. 51 lines 1433-1436: Added description of how BPA accounts for schedules in ETC_{Fi}. P. 44-45: Removed the definition of and all reference to the "94th Percentile Method". P. 47 lines 1305-1315 and P. 52 lines 1476-1486: clarified that LRES and SRES include reservations for all of BPA's adjacent TSP areas, filtered to reduce duplicates.	L Beckman L Trolese
16.0	06/27/2012	P. 40 lines 1084-1086: changed sentence to describe that BPA is grouping the generators for all of its adjacent BAAs instead of just a subset.	L Trolese
17.0	08/15/2012	P. 31 Table 2 BPA Flowgates: Added outage conditions flowgate definition for Raver-Paul (N>S). P. 29-30 lines 774,787,799: Replaced RADJ variable descriptions with RADJ/ETC.	L Beckman
18.0	09/20/2012	P. 12 line 299 Table 1 BPA Paths: Removed Transmission Line Components and RAS. P. 23-28 lines 599-607, 633, 750 and 752: Added new Non-firm products to formulas used for calculating Non-firm ETC and Non-firm ATC. P. 50-56 lines 1403-1411, 1428, 1479-1484 and 1604: Added new Non-firm products to formulas used for calculating Non-firm ETC and Non-firm AFC. Appendix C: Updated the SOL Methodology.	L Beckman
19.0	10/18/2012	P. 48 and 53, lines 1334 and 1513: Removed language on accounting for Conditional Firm products in the ETC Adjustment.	L Beckman

ATCID Revision History			
20.0	10/24/2012	P. 32 Table 2 BPA Flowgates: Added the South of Boundary Flowgate and Transmission Line Components. P. 33 Figure 3 BPA Network Flowgate Map: Added the South of Boundary Flowgate.	L Beckman
21.0	11/14/2012	P. 8, lines 159-167: Updated BPA's allocation processes for the Columbia Injection (N>S) and Wanapum Injection (N>S) flowgates. P. 31 Table 2 BPA Flowgates: Replaced Bettas Road - Covington #1 230kV with Bettas Road - Covington #1 230kV in the Cross Cascades North Flowgate Transmission Line Components. P. 31-33 Table 2 BPA Flowgates: Added the North of Hanford (S>N), South of Allston (S>N), Columbia Injection (N>S), Wanapum Injection (N>S) and West of Lower Monumental (E>W) Flowgates in Transmission Line Components, effective Nov. 30, 2012. P. 45 and 46, lines 1245-1248, 1286-1288 and 1318: Added documentation describing ETC calculation practices for light load ETC Cases. P. 55 and 56, lines 1564, 1574-1576 and 1580: Added RETC variable and definition to calculation formula for ETCFi for the Real-Time Horizon.	L Beckman
22.0	01/31/2013	Appendix A: Updated Seattle City Light's PNW AC Intertie Ownership Agreement to reflect shared ownership, effective 1/31/13.	L Wickizer
23.0	01/31/2013	P. 5 line 61, P. 22 line 579, P. 23 lines 594-596, P. 29 line 786: Removed BPA's TRM practice for the Northern Intertie S>N Path, effective Feb. 13, 2013. P. 31-33 Table 2 BPA Flowgates: Added the North of Echo Lake (S>N) and South of Custer (N>S) Flowgates and removed the Monroe-Echo Lake Flowgate in Transmission Line Components, effective Feb. 13, 2013. P. 32 Table 2 BPA Flowgates: Added John Day – Marion No. 1 500kV in the West of John Day Flowgate Transmission Line Components, effective Feb. 13, 2013. P.33 Figure 3 BPA Network Flowgate Map: Updated location of the North of Echo Lake (S>N) and South of Custer (N>S) Flowgates.	L Wickizer

ATCID Revision History			
24.0	02/12/2013	P. 5 lines 52-57, P. 22 lines 581-584, P. 23 lines 597-601, P. 29 lines 788-793, P. 30 lines 826-830: Added BPA's updated TRM practice for the Northern Intertie Path.	L Wickizer
25.0	03/04/2013	P. 58 lines 1651-1655: Added BPA's practice for Converting AFC to ATC.	L Wickizer
26.0	03/25/2013	P.32 Table 2 BPA Flowgates: Updated flowgate names on OASIS. P. 41 lines 1102-1112: Added documentation for Mid-Columbia generators in the weighted PTDF description.	L Wickizer
27.0	05/01/2013	P. 38-39 lines 993-1002: Updated BPA's process for mapping and incorporating outages into the WECC base case. Appendix A: Updated Avista's West of Hatwai Ownership Agreement number.	L Wickizer
28.0	05/15/2014	P. 7-8 lines 123-127, 131-134, 142-143, 149-150: Language clarification in Limiting Assumptions section. P. 9 lines 178-203: Updated BPA's process for outage planning. P. 10 lines 209 – 222: Language clarification on Daily and Hourly TTC and TFC Calculations. P. 10-11 lines 238 – 272: Language clarification on SOL Priorities Used to Set TTC and TFC. P. 37, lines 884-885, 892: Language clarification on SOL study process. P. 38, lines 952-953: Language clarification on SOL study process. P. 39, line 965: Language clarification on TFC calculation. Appendix C: Updated the SOL Methodology.	M Olczak
29.0	05/31/2014	P. 33 Table 2 BPA Flowgates: Added outage conditions flowgate definition for West of McNary.	M Olczak

ATCID Revision History			
30.0	7/24/2014	P. 32 Table 2 BPA Flowgates: Changed Olympia – South Tacoma 230kV to St. Clair – South Tacoma 230kV in the Raver-Paul section. P. 36 Table 3 Interfaces with BAs Adjacent to BPA: Added Gridforce Energy Management as a BA-BA interconnection. P. 36 Table 3 Interfaces with BAs Adjacent to BPA: Updated to show Portland General Electric and Seattle City Light also have connections accounted for with paths that use the Rated System Path Methodology. P. 5 Clarification on number of BAs within the WECC area	J Ofstead
31.0	09/13/2014	P. 33 Table 2 BPA Flowgates: Updated West of McNary flowgate definition during outages.	J Ofstead
32.0	10/21/2014	P. 7, lines 106-108: Language clarification on ATC and AFC hourly firm calculations	J Ofstead
33.0	12/05/2014	P. 18, lines 410-417: Language updated to reflect the current practice of setting TTCs in the non-prevailing flow direction on BPA's ATC Paths that use the Rated System Path Methodology.	L. Proctor
34.0	06/01/2015	P. 4, lines 32-38: Deleted lines regarding registration amongst other organizations other than NERC. P.5-6, lines 67-101: Deleted section on "BPA's Use of Western Electricity Coordinating Council Base Cases". P. 9, lines 179-238: Added "…and Criteria for TTC and TFC Calculations" to section title and deleted "Timeline" from title. Deleted all content in section except "Outage planned and the policy are posted to the Outage Plans website (http://www.oatioasis.com/bpat/index.html) (MOD-001 R3.6.1) (MOD-001 R3.6.2)" P15, lines 319-321: Added language to reflect the tracking and monitoring of the previous 12 months of curtailments due to the issuance of generation limits and inclusion of ATC calculations in Table 1. P.16, lines 347-349: Deleted language to reflect current practices. P. 16, line 350: Added "…and phase shifters". P. 16, lines 352-359: Deleted language regarding phase shifters.	L. Proctor

ATCID Revision History			
		P. 18, lines 362-363: Deleted language regarding BPA engineers running variations on WECC base cases. P.17, lines 371-373: Added language on base cases being updated with a Mid-Season update. P. 17, lines 388-389: Deleted reference to Table 1 for RAS. P. 17, line 391: Deleted language reference to BPA transmission lines with series compensation. P. 18, lines 401-404: Deleted language on modeling contingencies. P. 18, lines 416-417: Deleted language related to Montanan Intertie Path limitation by Colstrip Project and NorthWestern Energy is the TO and set TTC for this ATC Path. P. 18, lines 423-424: Deleted the reference to ATC paths for which BPA expresses TTC by nomongram. P. 18, lines 431-432: Deleted language related to the process defined by WECC's OTCPC. P. 18, line 437: Deleted reference to LaGrande Path. P. 18, lines 438-442: Deleted language related to path ratings. P. 19 lines 460-484: Updated language on TTC ratings. P. 21, lines 538: Deleted reference to Appendix D, which has been deleted from this document. P.30, lines 820-822: Deleted reference to DSO 319. P.31, lines 851-852: Table 2, BPA Flowgates: Deleted facilities monitored during outage conditions for West of McNary. P. 35, lines 863-866: Deleted "History or Flowgates". P. 35, line 873 and line 87: Replaced "included as" with "protected for by". P. 36, lines 883-884: Deleted "Note" on multiple interfaces.	

ATCID Revision History			
		P. 39-40, lines 1002, 1007 and 1008: Replaced "WECC" with "Peak". P. 40, lines 1032-1033: Updated language for accuracy. P. 40, lines 1037 and 1049: Replaced "calculated" with "published". P. 41, lines 1064: Added "…the PTDF difference is…". P. 44, lines 1164, 1175, 1190 and 1195: Deleted reference to BPA not having coordination agreements with other TSP. P.45, lines 1199: Added language to reflect BPA does not have coordination agreements with other TSPs. P. 45, line 1213: Deleted reference to Appendix D, which has been deleted. P. 63-64, line 1745 and chart: Deleted ATCID TP distribution list chart and updated language in line 1745 to reflect ATCID TP Distribution List. Appendix A: Updated chart listing contracts and specific paths with shared ownership, specifically Montana-NW/West of Garrison and added Montana Intertie and La Grande. Appendix B: Deleted – Significant Equipment Operating Bulletin 19. Appendix D: Deleted BPA NITS, GF and PTP Agreements list from 2011. Appendix E: Deleted DSO 319	
35.0	08/10/2015	Language updated to reflect completion of the bulk MOD-030 Mitigation Plan. P. 3, lines 7-8: Deleted "or Available Flowgate Capability (AFC)"	L. Proctor

ATCID Revision History			
		P. 4, lines 29-36: Deleted “MOD-001-1, MOD-004-1, MOD-008-1, MOD-028-1, MOD-029-1, and MOD-030-02 variously apply to the Transmission Operator (TOP) and Transmission Service Provider (TSP)”, “Transmission Operator”, and deleted lines 34-36; added “Transmission Operator”, Transmission Service Provider” and “among other registrations”; added “a” to line 38; lines 39-47: deleted “described in NERC Standard as its methodology”, “determine” and “interties, External interconnections and some Paths internal to BPA’s Network”; added “calculate”, “ATC Paths”, “for these paths” and “VIII, and IX”; deleted lines 44-47; line 50: deleted “in its ATC calculation”; line 53: “in its ATC and AFC calculations” and “or Flowgates”; line 54: deleted “Not Selected”; line 55 deleted; lines 56-59: deleted “has elected”, “to”, “described in NERC Standard MOD-028-1 as its methodology to determine ATC for any of its ATC Paths” and “MOD-028-01”, added “does”, “(MOD-028-2), the Flowgate Methodology (MOD-030-2), or a Capacity Benefit Margin (CBM) (MOD-004-1)” and “these standards are”; deleted lines 60-63 P. 5: lines 64, 65, 66, 69, 72, 75, 77, 78, 79 and 84: deleted “and AFC”; line 66 deleted “and Flowgate”; line 79-80 “MOD-030-R10”; line 81 deleted “MOD-030 R10.1”; line 82 deleted “MOD-030 R10.2”; line 83 deleted “MOD-030 R10.3”; line 84 deleted “or TFC”; lines 88-89 deleted “The studied assumptions are also used in determining the”, “for ATC purposes” and “and the TFC for AFC purposes”; added to line 89 “BPA uses these SOLs as the”; added to lines 97-100 “BPA may use more recent system condition information in its SOL calculations when the studies are updated after the ETC Cases are performed. However, this is not considered a difference in assumptions.” P. 6: lines 102-120 deleted; deleted “Flowgate” in lines 122-140; added “Network Paths” to lines 130, 134 and 136; added “Transfer” to line 133 P. 7: lines 144, 147, 150, 152, 161, 178, and 186 deleted “and TFC”; deleted “or Flowgate” in line 173, 178 and 186; added “Network Paths” in line 174 P, 8: deleted “and TFCs” in lines 188, 194, 198; replaced “TFC” with “TTC” in lines 193 and 200; added “Network Path” in line 201; added “for the Paths listed in Table 1” in lines 207-208; deleted line 212 P. 11: added “NV Energy” in line 243, and deleted “Sierra Pacific Power Company (SPPC) in line 254	

ATCID Revision History			
		P. 12: line 284 deleted “MOD-029” P. 25: lines 693, 697, 698, 701 and in chart replaced “Flowgate” with “Network Path”; line 694 and 698-699 replaced “Flowgate” with “Rated System Path”; line 696 replaced “30” with “29” and “02” with “1a” P. 26, 27 and 28: replaced “Flowgate” with “Network Path” in chart P. 28: replaced “Flowgate” with “Network Path” in lines 703 and 706; changed “Figure 1” to “Figure 2”; deleted lines 708-712 P. 30: deleted lines 713-723 and chart P. 31: deleted lines 724-766 P. 32: deleted lines 767-796; replaced “Flowgate” with “Transfer” in line 797 and “TFC” with “TTC”; added lines 798-801; deleted line 801-802 beginning with “BPA establishes…..”; deleted lines 803-806 P. 32: deleted lines 807-820; added “(ETC)” to line 821; replaced “AFC” with “ATC” I lines 824 and “Flowgates” with “Network Paths”; deleted “(MOD-030 R5.1) in lines 824; added “base” to line 825; added lines 825-829 beginning with “The assumptions…”; added “to” in line 835; deleted “(MOD-030 R5-2) in line 836; deleted “(MOD 030 R3.1)” in line 843; and deleted “(MOD 030 R3.4)” in line 847 P. 33: added “therefore does not” to line 848; deleted “(MOD 030 R3.5)” in line 849-850; replaced “AFC” with “ATC” in lines 853 and 858; deleted “(MOD 303 R3.2)” in line 855; deleted “(MOD 030 R3.3)” in lines 860; added “base” to line 863; and deleted “(MOD 303 R5.2)” in lines 867 and 872 P. 34: replaced “Flowgates” with “Network Paths” in lines 900, 902, 904, 906, 907 and 090; added “Network Path” to lines 914 and replaced “AFC” with “ATC”; and deleted “(MOD-030 R1.2.3)” in lines 922 P. 35: added “Network Path” and replaced “AFC” with “ATC: in lines 923, 926, 945 and 948; deleted “MOD” reference in lines 928, 932, 937, 942, 944, 950, 954, 959, 963 and 965	

ATCID Revision History			
		P. 36: deleted “MOD” references in lines 975-976, 983, 992 and 1003; replaced “Flowgate” with “Network Path” in lines 995; deleted “as described in” in line 996 and replaced “MOD-030 R6” with “(MOD-030 R5) in line 996 P. 37: deleted references to MOD in lines 1008, 1010, 1012, 1030, 1033, 1035, 1037, 1040 and 1041-1042; and replaced “Flowgates” with “Network Paths” in lines 1017-1018, 1027 and 1040 P. 38: replaced “Flowgates” with “Network Paths” in lines 1043, 1053 and 1063; added “Network Path” and replaced “AFC” with “ATC” in line 1056; added “base” to line 1064; and deleted MOD references in lines 1066 and 1075 P. 39: replaced “Flowgates” with “Network Paths” in line 1082; deleted MOD references in lines 1082 and 1085-1086; deleted “power flow” from line 1093 and added “ETC” P. 40: replaced “Flowgates” with “Network Paths” in lines 1127 and 1129-113-; deleted MOD references in lines 1121-1122, 1126, 113601137, 1141, 1144-1145 and 1147-1149 P. 41: added “base” in lines 1151, 1154 and 1157; replaced “Flowgates” with “Network Paths” in lines 1181 and 1183; added “Network Path” in line 1182 and replaced “AFC” with “ATC”; and changed “Table 4” to “Table 3” in line 1187 P. 42: replaced “Flowgates” with “Network Paths” in lines 1197, 1200, 1204 and 1206; deleted references to MOD in lines 1198 and 1206; added “Transfer” in lines 1199, 1204 and 1206; replaced “AFC” with “ATC” in lines 1199, 1200, 1202 and 1204; added “(MOD-029 R7) in line 1201 P. 43: replaced “Flowgate” with “Transfer” in lines 1208, 1220, 1225, 1229 and 1233; replaced “TFC” with “TTC” in line 1209; replaced “Flowgates” with “Network Path” in lines 1210-1211; and deleted “base” I line 1219 P, 44: replaced “Flowgate” with “Network Path” in lines 1246, 1247, 1256, 1258-1259, 1260, 1262, 1263, 1267-1269 and 1269; deleted MOD reference in 1255’ changed “AFC” to “ATC” in line 1264 and 1267 P. 45: changed “AFC” to “ATC” in lines 1271, 1278, 1280, 1283 and 1307; replaced “Flowgate” with “Network Path” in lines 1272, 1277, 1278 and 1282; replaced “Flowgate” with “Transfer” in line 1274	

ATCID Revision History			
		P. 46: replaced “Flowgate” with “Network Path” in lines 1309 and 1330; deleted “as described in MOD-030 R7” in line1311; added “(MOD-029 R6)” to line 1311; and deleted references to MODs in lines 1316, 1322, 1325, 1327, 1337 and 1343 P. 47: replaced “Flowgate” with “Network Path” in lines 1346, 1348, 1353-1354 and 1360; removed “(MOD-030 R7.7)” in line 1345; added “Network Path” to line 1356 and replaced “AFC” with “ATC”; replaced “Flowgate” with “Transfer” in line 1358; replaced “AFC” with “ATC” in lines 1358, 1359, 1367, 1369, 1377, 1379 and 1381 P. 48: replaced “AFC” with “ATC” in lines 1382, 1385, 1387, 1389 and 1400; replaced “Flowgate” with “Network Path” in lines 1382, 1387-1388, 1391, 1396, 1397-1398; replaced “TFC” with “TTC” in line 1385; replaced “Flowgate” with “Transfer” in lines 1387, 1391, 1393, 1409 and 1414; added “Network Path” to line 1400; and deleted “base” from line 1413 P. 49: replaced “Flowgate” with “Transfer” in lines 1418 and 1422; replaced “Flowgate” with “Network Path” in lines 1435 and 1436 P. 50: added “Network Path” in lines 1445 and 1467 and changed “AFC” to “ATC”; deleted MOD reference in line 1451; replaced “Flowgate” with “Network Path” in lines 1463 and 1464 P. 51: added “Network Path” to line 1481 and replaced “AFC” with “ATC”; and replaced “Flowgate” with “Network Path” in line 1497 P. 52: replaced “Flowgate” with “Network Path” in lines 1498, 1499, 1501, 1502, 1507, 1508, 1510, 1519 and 1524; replaced “Flowgate” with “Transfer” in lines 1503 and 1512; replaced “AFC” with “ATC” in lines 1507, 1514, 1519, 1521, 1525, 1527; replaced “TFC” with “TTC” in lines 1521, 1525, 1526 and 1527; and deleted lines 1528-1532 P. 53-57: added lines 1339-1516 P. 58: deleted “and AFC” in line 1713; changed “Nevada Power” to “NV Energy” in line 1726; deleted “(PAC)” from line 1729; and deleted “Sierra Pacific Power Company” from line 1740	

ATCID Revision History			
		P. 59: replaced "Flowgates" with "Network Path" in line 1762; deleted "and Flowgates" in line 1766; and deleted line 1767	
36.0	8/28/15	Moved Appendix B: System Operating Limit Methodology for the Operations Horizon; Appendix 1 – TPL-001-0.1System Performance Under Normal Conditions; and Appendix 2 – TPL-001-WECC-RBP-2.1 into a separate document titled "System Operating Limit Methodology for the Operations Horizon " and posted on the same website astheATCIDat: http://www.bpa.gov/transmission/Doing%20Business/Pages/default.aspx under the ATC Methodology.	L. Proctor
37.0	9/29/15	Deleted reference to the Appendix B SOL in line 253 and added the SOL website address on BPA's ATC Methodology website in lines 255-257; deleted lines 258-263 regarding prevailing and non-prevailing directions of flow (MOD-029 R2.2) and inserted new language; removed reference to Appendix B: SOL in line 253 and added link to the SOL in line 25; and deleted in Appendix A for the COI, under the Contract Party Seattle City Light "EDF Trading North America LLC and Southern California Edison Company (Effective 1/31/2013)", under Contrat Number deleted "13ZZ-15826 (formerly" and added under Contract Description, Consent Agreement, Contract Party "Under consent agreement and EDF Trading North American LLC".	L. Proctor
38.0	11/02/15	Removed reference to Appendix B in line 298 and added link to SOL; updated Table 2, BPA Network Paths table beginning on line 656 for the North of John Day On OASIS: NOJDAY path changed from Watuoma-Ostrander to Wautoma-Knight and the Cross Cascades South on OASIS: C-CACS_S changed from Wautoma-Ostrander to Knight-Ostrander and deleted in Appendix A the Contract Party Seattle City Light Consent Agreement Contract Number 10TX-15107 from the COI path.	L. Proctor
39.0	12/07/15	Updated Outage Plan website link in line 104-105 from OASIS http://www.oatioasis.com/bpat/index.html to http://www.gpa.gov/transmission/Reports/Pages/Proposed-Outages.aspx; moved "(MOD-001 R3.6.1) (MOD-001 R.3.6.2)" to line 115; and added outage language in lines 106-115.	L. Proctor

ATCID Revision History			
40.0	1/03/16	p. 12, lines 241-255: Replaced "beyond two weeks" with "from the next day and beyond" and "periods within the next two weeks" with "the Real-time horizon" and added "On West of Garrison" and "On Northern Intertie South to North, for the seasons or time periods in which the seasonal studies have not been completed, the last year's seasonal study results will be used for setting the TTC for the relevant Path. " p. 17, lines 430-435: Added "BPA also uses SADJ adjustments on the Northern Intertie Path 3 S>N. These adjustments are used to account for uncertainties on the path caused by simultaneous interaction with paths COI and NOH. The SADJ is being used temporarily while BPA tests and implements an additional 450MW TRM value for this path. BPA will stop using SADJ for this purpose on NI S>N once testing of the additional TRM value is complete and it is implemented." p. 21, lines 564-569: Added "In addition, BPA uses SADJ adjustments on the Northern Intertie Path 3 S>N. These adjustments are used to account for uncertainties on the path caused by simultaneous interaction with paths COI/NOH. The SADJ is being used temporarily while BPA tests and implements and additional 450MW TRM value for this path. BPA will stop using SADJ for this purpose on NI S>N once testing of the additional TRM value is complete and it is implemented." p. 24, lines 647-649: Added "50 MW " and "However, BPA does release the additional 450 MW TRM for the Northern Intertie Path S>N as non-firm capacity."	L. Proctor
41.0	9/06/2016	p. 11, line 243: Added "On West of Garrison,"; line 249: Added "On Northern Intertie South to North,"; lines 252-253: Added "from the next day and beyond." and "the Real-time horizon" p. 16, line 430-431: Added "SADJ" and "reflect the TRM across this path that"; deleted lines 433-436 p. 20, line 565: Added "SADJ", "reflect the TRM across this path that" and "and"; deleted lines 567-570 p. 23, Deleted lines 648-650; added in lines 650-652: "BPA does not release the TRM Due to simultaneous path interactions for the Northern Intertie Path S>N as non-firm capacity, but does not release the remaining TRM as non-firm capacity"	L. Proctor

ATCID Revision History			
42.0	11/01/2016	Table of Contents: Deleted section IX. BA to BA Interconnection Methodology per BPA decision to no longer utilize this methodology p. 26, Table 2, BPA Network Paths starting on line 693: Added to Paul-Allston on OASIS: PAUL_ALSN, column Transmission Line Components "During outage conditions of the Paul-Allston #2 500kV line with either of the Paul-Napavine #1 or Napavine-Allston #1 500kV lines, the following lines are monitored: Napavine-Allston #1 500kV; Paul-Allston #2 500kV; Longview-Chehalis #1 & #3 230kV; Holcomb-Naselle #1 115kV p.34, lines 930-931: Deleted "and light load ETC Cases for the month of January" p. 36-37, lines 967-1001: Replaced "90th Percentile Method" with "Nameplate Adjusted Method"; replaced "each project's 90th percentile of historic generation by project and month" with "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."; deleted lines 975-986; added lines 986-995; deleted lines 998-1001 p. 37, lines 1007-1011: Replaced "modeled at up to 80 percent of the wind generators' contract Demands for BPA's area and all adjacent TSP area" with "set at the greater of the following: Modeled on the 100 percent of the contract demand for the wind generator; or Modeled off and replaced by the "Balancing Logic Method" p. 37, line1020: Replaced "90th Percentile" with "Nameplate Adjusted" and "on p. 35" with "above p. 37, lines 1032-1035: Deleted "the Mid-Columbia Hydro Projects by 50 percent of the excess generation and FCRPS generation by the other 50 percent of the; added "Prorata, except for the stress FCRPS zone, see below"; and replaced "90th Percentile" with "Balancing Logic" p. 38, lines 1039-1041: Deleted lines	L. Proctor

ATCID Revision History			
		p. 38, 1043-1051: Replaced “two” with “three”; replaced “NITSfi” with “PTPfi and NITSfi” and “and stressing the three different zones of the FCRPS. For the FCRPS scenarios, the three “zones” that are stressed individually in the scenarios are made up of the following projects: (i) Upper Columbia zone includes Grand Coulee and Chief Joseph; (ii) Lower Snake zone includes Lower Monumental, Lower Granite, Little Goose, and Ice Harbor; and (iii) Lower Columbia zone includes McNary, John Day, The Dalles, Bonneville. p. 38, lines 1055-1056 and lines 1059-1060: Replaced “90th Percentile” with “Nameplate Adjusted” p. 38, lines 1062-1063: Deleted “NITSfi” and replaced “p. 39” with “above” p. 38-39, lines 1064-1086: Replaced “four” with “12”; updated scenarios on lines 1066-1077; deleted lines 1078-1080; added language starting in line 1080-1086 ; deleted line 1092 p. 41, Added lines 1135-1142 p. 46, Added lines 1322-1329 p. 49-53, lines 1376-1553: Deleted section IX. BA to BA Interconnection Methodology per BPA decision to no longer utilize this methodology.	
43.0	11/14/2016	p. 9, lines 185-192: Deleted language regarding the tracking and monitoring of issuance of gen limits. Modified language in regards to adding new ATC paths to be more general. p. 9. Lines 190-192: Added “if new” and “are identified and implemented. Table 1 will be updated to reflect the new ATC Paths.” p.34, lines 925-926: Added “and light load ETC Cases for the month of January”:	L. Proctor
44.0	4/1/2017	p.7, Line 136: Remove “and TFC,” to correct an oversight when changes were made in version 35 to remove all references to flowgates, TFCs and AFCs.	A. Heredia

ATCID Revision History			
		pps. i, 5 – 9, 14-16, 27: All other modifications are made to incorporate changes to align the ATCID with changes resulting from 1) revisions to Peak Reliability's SOL Methodology v.8.1; and 2) changes in TOP and IROL standards that are effective April 1, 2017. As of April 1, 2017, BPA will continue to use SOLs as TTCs for ATC calculations for stability limited paths; various system conditions will be used to develop TTCs for thermally limited paths. Appendix A: Removed.	
45.0	9/19/2017	p. 11, Added lines 335-336 p. 12, line 339: Added "When modeling contingencies" p. 12, lines 343-349: Added "When modeling contingencies" and "until flows exceed emergency Facility Ratings or voltages fall outside emergency system voltage limits (i.e., the post-Contingency state) and deleted "one of the following reliability constraints is encountered: 1) In the pre-Contingency state, flows exceed normal Facility Ratings or voltages fall outside normal system voltage limits; or (2) In the post-Contingency state, flows exceed emerging Facility Ratings or voltages fall outside emergency system voltage limits." and "The contingencies studied to determine the post-Contingency state are posted on Peak Reliability's secure website https://www.peakrc.org.".	L. Proctor
46.0	4/01/2018	p. 4, line 111: Deleted "See Appendix A for a list of contracts and specified Paths with shared ownership." p. 11, lines 308-312: Deleted "BPA uses the minimum SOL from the relevant seasonal studies to set the TTC of the Path for periods beyond two weeks."; "within the next two weeks"; "maximum"; "mw"; "SOL"; and "seasonal" from "seasonal studies". Added "all time"; "MW"; "value" and "seasonal" to "seasonal TTC". Line 332 deleted "always credible". p. 34, line 999: Removed "June".	L. Proctor

ATCID Revision History			
		p. 38-39, lines 1111-1136: Changed "12" to "6". Removed "CER modeled one/" from lines 1113-1118; Deleted lines 1119-1124; Deleted "two seasonal groupings" and "Early and". Added "with CER modeled off" and "with CER modeled on for the last 3 scenarios". Lines 1127, 1128 and 1130: Replaced "24" with "15". Table, row month June, under "Base ETC Values Used" column, changed "June" to "May". p. 40, line1179: Deleted "June". p. 46, line 1366: Deleted "June".	
47.0	10/12/2018	p. 23, lines 711-713: Minor simplification of language for clarity.	M. Olczak
48.0	10/31/2018	p.16 and p.20, removed references to TRM values being accounted for as SADJ. BPAT will no longer use SADJs to account for TRM beginning 11/1//2018.	M. Olczak
49.0	06/01/2019	p. 49, lines 1460 – 1465: added a section on adjustments to ATC values on Network Paths when testing in BPA's production systems is necessary.	M. Olczak
50.0	08/14/2019	P.16, line 505 and P.23, line 701 – detail of how BPA implements TRM has been removed from the ATCID. See the TRMID for TRM information. p.23, line 712 – BPA has updated its "PostbacksNF for the Real-time Horizon" section. BPA will no longer be using a Miles City postback, due to the implementation of the TRM across West of Garrison E>W. BPA is discontinuing the use of RETC in BPA's ETC calculation. References to the RETC variable have been removed from the document.	M. Olczak
51.0	09/10/2019	p.29 – removed references to BPA's Outage to Base Case Mapping document. The mapping of outages to the WECC base case is contained in BPA's Transmission Reference Entity Data system. p.30, line 802 – specifies that BPA updates its Hourly PTDFs at least once per day for hourly ETC calculations	M. Olczak

ATCID Revision History			
		p.30, line 808 – clarifies that BPA uses Daily PTDFs published for hour ending 11 of each day in its Daily ETC calculations p.30, lines 812 – 814 and 816 – 819 – clarifies which generation and transmission outages are included in BPA's daily and monthly ETC calculations	
52.0	11/01/2019	p.11: deleted the statement related to West of Garrison that read "For all time periods, when there are no studied outages, BPA uses a TTC of 2000 MW E>W and the maximum value from the relevant studies to set the seasonal TTC of the Path W>E." This statement is no longer applicable as of 8/14/2019. Please see OASIS for TTC values. p.12, lines 333 – 335 and 342, p.13, lines 388-393: changed Peak RC references to RC West p.13, lines 377 – 387: clarification on study process for ATC Paths with Ratings that were established, known and used in operation since January 1, 1994 p.15, Calculating Firm Available Transmission Capability section: removed ATC Firm formulas from end of section since the formula is already stated in line 465 p.18, Calculating Non-Firm Available Transfer Capability section: removed ATC Non-Firm formulas from end of section since the formula is already stated in line 601 p.29, lines 774 – 777: removed references to Peak RC from this section and clarified the modeling data included in the WECC base cases	M. Olczak
53.0	11/13/2019	ATCID has been updated to reflect that BPA will be calculating base ETC for West of Hatwai using flow-based studies. As such, the following changes have been made: p. 7, removed West of Hatwai from Table 1 p. 24, added West of Hatwai to Table 2 p. 24, added column to Table 2 entitled "Case used for base ETC calculation." This column identifies whether BPA is using heavy or light load studies to establish base ETC_{FI} for each path.	M. Olczak

ATCID Revision History			
		p. 33, line 932: BPA has renamed this section "Determining Base ETC_{Fi} for Heavy Load Base Cases." All information on light load cases has been removed from the section. p. 35, line 1018: BPA has renamed this section "Sensitivity Studies for Heavy Load Base Cases" to clarify that these sensitivity studies only apply to heavy load cases. p. 37, line 1059: BPA has added a section entitled "Determining Base ETC_{Fi} and Sensitivities for Light Load Base Cases." This section provides information on the assumptions and sensitivities for BPA's light load case studies. BPA has removed references to adjustments that BPA had been making for West of Hatwai to hold out NITS capacity for the Western Montana hydro projects; these obligations are now included in BPA's base ETC_{Fi} studies for West of Hatwai and the adjustments are therefore no longer needed. Maps of BPA paths have been removed from the ATCID. Upon evaluation, BPA has determined that the SADJ/ETC adjustments across the West of Garrison path are no longer appropriate. BPA has removed references to these adjustments throughout the document. p. 36, lines 1052-1053: clarification that the difference between the highest and lowest seasonal base ETC_{Fi} values is used to establish a commercial uncertainty margin.	
54.0	01/28/2020	p.12, line 396: corrected email address p.13, line 399: corrected link p.27, lines 716-717 and lines 720-721: simplified wording p.27 – 28: deleted the following language in the "Use of WECC Base Cases to Determine ETC" section, as the language does not reflect BPA's current process: "BPA updates the relevant WECC base cases with equipment outages which are known and mapped to the WECC base case, as well as newly-energized generation and Transmission for ATC calculations at least once per day for intra-day, next day and days two through 30.	M. Olczak

ATCID Revision History			
		BPA updates the relevant WECC base cases with equipment outages which are known and mapped to the WECC base case, as well as newly-energized generation and Transmission for ATC calculations at least once per month for months two through 13." p.29: In the "PTDF Analysis and De Minimis" section, deleted the sentence reading "Ten percent is the percentage used to curtail in the Western Interconnection-wide congestion management procedure." This is a simplification of this section and does not impact the methodology related to this topic. p.32: deleted the following language in the "Determining Base ETCFi for Heavy Load Base Cases" section, as the language does not reflect BPA's current process: "In ETC Cases, BPA models all of its own NITSFi, GFFi and PTPFi Long-Term Reservations, as well as those of its adjacent TSPs, active at the time the ETC Cases are produced. To model the impact of PTPFi long-term reservations for all of its adjacent TSPs, BPA queries a list of PTPFi long-term reservations from the OASIS of its adjacent TSPs. To model the impact of GFFi and NITSFi long-term obligations for all of BPA's adjacent TSPs, BPA contacts its adjacent TSPs and requests a list of their GFFi obligations and a list of their NITSFi with a list of designated network resources with the MW amounts designated to serve Network Service and Native Load. BPA models the NITSFi, GFFi and PTPFi Long-Term obligations of all of its adjacent TSPs to the extent that there are sufficient firm Transmission rights on BPA's or its adjacent TSPs' Transmission Systems to serve the Load." p.49, line 1480: corrected link	
55.0	03/24/2020	p.27, line 720: added the word "seasonal" to clarify which WECC cases BPA uses for its ETC studies p.27, lines 722-724: clarified which load forecasts BPA is using in its ETC studies p.28: streamlined section with removal of sentence stating "See "Determining Base ETC_{Fi}" section for a description of how BPA develops its ETC Cases"	M. Olczak

ATCID Revision History			
		p.32, section titled “Determining Base ETC for Heavy Load Base Cases”: changes throughout the section to reflect BPA’s transition to monthly base ETC studies p.35, lines 1013-1017: removed references to seasonal cases to support BPA’s transition to monthly base ETC studies p.35, lines 1028-1029: changed wording to reflect BPA’s transition to monthly base ETC studies p.35, lines 1030-1033: changes to reflect that BPA uses the highest base ETC to calculate firm ATC and lowest base ETC to calculate non-firm ATC; reference to commercial uncertainty margin removed p.35-36, lines 1034-1039: changes to reflect BPA’s transition to monthly base ETC studies p.36, lines 1041-1047: changes to reflect BPA’s transition to monthly base ETC studies p.37, lines 1060-1064: change to reflect that BPA uses the highest base ETC to calculate firm ATC and lowest base ETC to calculate non-firm ATC; reference to commercial uncertainty margin removed p.38, SADJ/ETC Adjustments section: removed references to SADJs for the commercial uncertainty margin, as this process has been discontinued p.44, SADJ/ETC Adjustment section: removed references to SADJs for the commercial uncertainty margin, as this process has been discontinued and clarified that an SADJ is used to account for BPA’s use of the lowest base ETC in the non-firm ATC calculation.	
56.0	05/20/2020	p.1, lines 23-26: modified the “Long-Term Reservation” and “Short-Term Reservation” definitions to clarify that all requests (including Network Integration) fall into each definition based on duration p.27, lines 721-728: clarification on load and generation forecasts used in BPA’s ETC cases p. 28, lines 750-751: slight rewording to clarify PTDF calculation process	M. Olczak

ATCID Revision History			
		p.29: removed sentence reading “The source used in BPA’s Network Path ATC calculations of transactions for all adjacent TSPs is obtained from the source field if a source is identified, or the POR field if only the POR is identified.” This no longer applies with the elimination of adjacent TSP impact functionality in OATI. p.30: removed sentence reading “The sink used in BPA’s Network Path ATC calculations of transactions for all adjacent TSPs is obtained from the sink field if a sink is identified, or the POD field if only the POD is identified.” This no longer applies with the elimination of adjacent TSP impact functionality in OATI. p.30: removed section on the weighted PTDF for FCRPS generation in the Idaho Power Company BAA. This no longer applies with the elimination of adjacent TSP impact functionality in OATI. p.31, line 855: conformed the formulas/definitions in the “Calculating Firm Existing Transmission Commitments” section to MOD-029 (section referenced MOD-030 formulas/definitions, which BPA no longer uses). References to calculations of adjacent TSP impacts have been deleted, due to elimination of adjacent TSP impact functionality in OATI. p.32, lines 896-897, 905-906, and 911-912: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October. p.35, line 1002: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October p.35-36, Table 3: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October p.36, lines 1040-1041: removed reference to adjacent TSPs from section. This no longer applies with the elimination of adjacent TSP impact functionality in OATI. p.37, lines 1060-1061: Simplification of LRES and SRES definitions, to account for the elimination of adjacent TSP impact functionality in OATI p.39, lines 1116-1120: documentation that BPA will use zero as the base ETC when the ETC cases result in a negative base ETC value.	

ATCID Revision History			
		p.40, line 1145: conformed the formulas/definitions in the "Calculating Non-Firm Existing Transmission Commitments" section to MOD-029 (section referenced MOD-030 formulas/definitions, which BPA no longer uses). References to calculations of adjacent TSP impacts have been deleted, due to elimination of adjacent TSP impact functionality in OATI. p.42, lines 1221-1222: Simplification of LRES and SRES definitions, to account for the elimination of adjacent TSP impact functionality in OATI p.43, lines 1262-1265: updated definitions for SCH^{+}_{7} and ASC^{+}_{7} to account for the elimination of adjacent TSP impact functionality in OATI p.44, lines 1279-1280: updated definition for $RRES_{NF}$ to account for the elimination of adjacent TSP impact functionality in OATI p.44, lines 1291-1294: updated definitions for $\mathbf{SCH^{+}_{6,5,4,3,2,1}}$ and $\mathbf{ASC^{+}_{6,5,4,3,2,1}}$ to account for the elimination of adjacent TSP impact functionality in OATI p.45, lines 1322-1324: updated definition for $Counterflows_{NF}$ to account for the elimination of adjacent TSP impact functionality in OATI p.45-46, lines 1325-1331: documentation that BPA will use zero as the base ETC when the ETC cases result in a negative base ETC value. Throughout the document: conformed ETC and AFC formula terms and definitions from MOD-030 to MOD-029 (i.e. PTP_{FI} to PTP_{F}) and replaced any references to "flowgates" with the term "network paths."	
57.0	09/16/2020	p.2, line 38: added Satsop Injection to the list of ATC Paths for which BPA has a TRM p.7-8, Table 1: Added Satsop Injection to the table of BPA's 1:1 ATC Paths p.7, line 235: clarified that this section applies to BPA's 1:1 ATC Paths. Paths listed in this section will be referenced by BPA as 1:1 ATC Paths going forward. References to these paths have been conformed to this new naming convention throughout the ATCID.	M. Olczak

ATCID Revision History			
		p.23, line 708: clarified that this section applies to BPA's Flow-Based ATC Paths. Paths listed in this section will be referenced by BPA as Flow-Based ATC Paths going forward. References to these paths have been conformed to this new naming convention throughout the ATCID.	
58.0	09/30/2020	Throughout document, changed references from MOD-029-1a to MOD-029-2a to match current effective NERC standard. p.27: moved some of the language pertaining to how BPA models generation in its ETC base cases from "Use of WECC Base Cases to Determine ETC" section to p.32, lines 916-917. Language has been modified to better reflect process that BPA uses (process has not changed; this is a documentation change only). p.37, line 1081: language describing the LETC variable has been clarified p.42, line 1240: language describing the LETC variable has been clarified	M. Olczak
59.0	10/21/2020	p.9, line 263: Updated name to match NERC registry p.27, lines 727-735: Added information on loads used in BPA's Winter light load ETC base cases for both BPA's Balancing Authority and outside of BPA's Balancing Authority p.32, lines 905-921: revised to reflect BPA has transitioned from a Winter seasonal ETC study to monthly ETC studies for November through February. p.35, line 1013-1024: revised to reflect BPA has transitioned from a Winter seasonal ETC study to monthly ETC studies for November through February. p.36, "Determining Base ETC and Sensitivities for Light Load Base Cases" section: removed outdated verbiage regarding the balancing of the case.	M. Olczak
60.0	02/17/2021	p.1, lines 6-9: purpose statement has been revised to clarify that BPA's ATCID also documents BPA's Postback Methodology, as required by the NAESB Wholesale Electric Quadrant business practice standards.	M. Olczak

ATCID Revision History			
		p.14, line 460: removed page number references to streamline document p.15, line 495: removed page number reference to streamline document p.16, lines 504-507: slight rewording to better align with the NAESB Postback Methodology requirements in the Wholesale Electric Quadrant business practice standards; there has not been a change to BPA's Postback Methodology. p.17, line 563: removed page number reference to streamline document p.20, line 640: removed page number reference to streamline document p.21, line 654: removed page number reference to streamline document p.21, line 670: removed page reference to streamline document p.22, lines 684-698: slight rewording to better align with the NAESB Postback Methodology requirements in the Wholesale Electric Quadrant business practice standards; there has not been a change to BPA's Postback Methodology. p.27, lines 731-732: clarifies that BPA uses the loads in the WECC light load cases for BPA's Balancing Authority p.27, lines 734-735: clarifies that BPA uses the loads in the WECC light load and heavy load cases outside of BPA's Balancing Authority p.32, line 905: revised to reflect that BPA has fully transitioned to monthly base ETC cases. p.32, lines 911-14: revised to reflect that BPA has fully transitioned to monthly base ETC cases. p.35, lines 1012-1013: revised to reflect expanded scenarios for March through May p.35, Table 3: Table 3 has been deleted; Table 3 is no longer applicable as BPA has fully transitioned to monthly base ETC cases	

ATCID Revision History			
		p.35, lines 1022-1024: documents the starting point for BPA's Summer light load cases and that the Summer light load ETC case is used to set the base ETC for April through October. p.37, lines 1074-1075: change to reflect that the CER PTDF adjustment is only being used for June through October p.38, lines 1101-1104: slight rewording to better align with the NAESB Postback Methodology requirements in the Wholesale Electric Quadrant business practice standards; there has not been a change to BPA's Postback Methodology. p.40, line 1174: removed page number reference to streamline document p.41, lines 1231-1232: change to reflect that the CER PTDF adjustment is only being used for June through October p.44, lines 1302-1306: slight rewording to better align with the NAESB Postback Methodology requirements in the Wholesale Electric Quadrant business practice standards; there has not been a change to BPA's Postback Methodology.	
61.0	02/26/2021	p.20, lines 631-636: clarification of the SCH and ASC variables, and where energy versus transmission profiles are used p.20-21, lines 661-676: clarification of the SCH and ASC variables, and where energy versus transmission profiles are used p.29, lines 801-804: removed reservation evaluation and de minimis criteria from the ATCID, and added reference to the Transmission Service Requests Evaluation business practice, which now defines BPA's processes for evaluating Transmission Service Requests. p.32, lines 904-905: clarifies that BPA deems de minimis impacts to be zero when calculating firm ETC using reservations. p.37, lines 1094-1096: minor clarification to language p.40, lines 1175-1178: clarifies that BPA deems de minimis impacts to be zero when calculating non-firm ETC using reservations.	M. Olczak

ATCID Revision History			
		p.42, lines 1253-1254: clarifies that BPA deems de minimis impacts to be zero when calculating firm ETC using reservations. p.42, lines 1264-1268: clarification of the SCH and ASC variables, and where energy versus transmission profiles are used p.43, lines 1284-1285: clarifies that BPA deems de minimis impacts to be zero when calculating non-firm ETC using reservations. p.44, lines 1295-1308: clarification of the SCH and ASC variables, and where energy versus transmission profiles are used	
62.0	04/08/2021	p.15, lines 490-491: added clarification that BPA uses SADJ across NI S>N to account for a portion of the firm TRM across this path. This is a process clarification and not a change to how the TRM or ATC calculations are performed. p.15, lines 477-480: clarified that the LETC variable is used for $NITS_F$, GF_F, PTP_F and ROR_F in the ETC_F calculation. This is a clarification and not a change to BPA's process. p.15, Table between lines 497 and 498: aligned ETC variables with the OATI variables. This is a formula clarification and not a change to how the ETC calculation is performed. p.19, lines 621-624: clarified that the LETC variable is used for $NITS_F$, GF_F, PTP_F and ROR_F in the ETC_F calculation. This is a clarification and not a change to BPA's process. p.20, Table between lines 629 and 630: aligned ETC variables with the OATI variables. This is a formula clarification and not a change to how the ETC calculation is performed. p.42, Table between lines 1260 and 1261: aligned ETC variables with the OATI variables. This is a formula clarification and not a change to how the ETC calculation is performed.	M.Olczak

ATCID Revision History			
63.0	05/12/2021	p.3, footnote: removed reference to North of John Day, as this path has been de-activated; also matched up the names of the paths listed in the footnote to those used in Table 2 on Page 24 p.11, line 347 and content previously found between lines 351-352: deleted references to North of John Day, as this path has been de-activated p.24, Table 2: removed North of John Day from table, as this path has been de-activated	M. Olczak
64.0	05/19/2021	p.28, "Outages in ETC Calculations" section: deleted sentences on generation outages in ETC calculations; BPA does not include generation outages in its ETC calculations p.30, lines 848-853: added specificity that the weighted FCRPS PTDF calculation is based on the stress scenario per path, and clarified the time frame for which generation forecasts are used in the calculation of this PTDF p.33, lines 931-939: revised to explain BPA's transition to a new methodology for modeling the Willamette Valley projects in its ETC cases p.35, line 1019: revised to reflect the scenarios BPA is currently running in the heavy base ETC cases p.37 and p.41: deleted references to CER SADJs, as these SADJs have been replaced by additional base ETC scenarios	M. Olczak
65.0	09/15/2021	Extensive re-organization of the ATCID to combine the 1:1 and Flow-based ATC Path sections into one. p.17, lines 438-444: language addition to account for new OASIS functionality for short-term Redirects to comply with FERC policy adopted in Order 676-I	M. Olczak
66.0	09/29/2021	p.22, p.23 and p.31: removed references to ST non-firm ATC adjustments for lowest base ETC (these adjustments have been replaced with a new non-firm ATC variable, NFETC) p.30, line 891: replaced reference to LETC with new non-firm ATC variable, NFETC p.31, lines 907 and 911: replaced references to LETC with new non-firm ATC variable, NFETC	M. Olczak

ATCID Revision History			
		p.31, line 921: replaced references to LETC in the chart with new non-firm ATC variable, NFETC	
67.0	10/20/2021	p.1, line 13: added reference to NAESB WEQ-000 p.20, lines 514 and 516: revised to explain BPA's transition to a new methodology for modeling the Willamette Valley projects in its ETC cases p.22, line 601: added the months of November through February for the CER off scenarios p.22, lines 615-619: added specificity to the modeling of Montana loads in the light load cases	M. Olczak

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