

B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N



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

Bonneville Power Administration
Transmission Services

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3 I. Purpose

4 This BPA Available Transfer Capability Implementation Document (ATCID) addresses all of the
5 requirements of North American Electric Reliability Corporation (NERC) Reliability Standard
6 MOD-001-1a Available Transmission System Capability. This ATCID is specifically required by
7 MOD-001-1a, R3 and its subrequirements. This ATCID only applies to ATC calculations through
8 month 13.

9 II. Definitions

10 All capitalized terms used in this ATCID are either contained in NERC's Glossary of Terms used
11 in NERC Reliability Standards or, if not in NERC's glossary, are defined in this ATCID.

12 Defined terms specific to BPA include:

- 13 • **Federal Columbia River Power System (FCRPS):** The Transmission System
14 constructed and operated by BPA and the 31 federally-constructed hydroelectric
15 dams¹ on the Columbia and Snake Rivers, and the Columbia Generating Station nuclear
16 plant. Each entity is separately managed and financed, but the facilities are operated
17 as an integrated power System.
- 18 • **Federal Columbia River Transmission System (FCRTS):** The FCRTS is comprised of
19 BPA's main grid network Facilities (Network), Interconnections with other
20 Transmission Systems (External Interconnections²), Interties,³ delivery Facilities,
21 subgrid Facilities, and generation Interconnection Facilities within the Pacific
22 Northwest region and with western Canada and California.
- 23 • **Long-Term Reservation:** a confirmed reservation that has duration greater than or
24 equal to 365 days or any confirmed firm Network Integration Transmission Service
25 reservation.
- 26 • **Short-Term Reservation:** a confirmed reservation that has duration less than 365
27 days, excluding confirmed firm Network Integration Transmission Service reservations.

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.

28 III. Overview

29 BPA owns and provides Transmission Service over the FCRTS (see p. 3 for definition). BPA is
30 registered with NERC as a Transmission Operator (TOP) and Transmission Service Provider
31 (TSP), among other registrations.

32 Methodologies Selected

33 MOD-029-1a

34 BPA has elected to use the Rated System Path Methodology (MOD-029-1a) to calculate ATC
35 for its ATC Paths. The description of how BPA implements this methodology for these
36 paths is included in Sections VII, VIII, and IX of this ATCID. (MOD-001 R1)

37 MOD-008-1

38 BPA maintains Transmission Reliability Margin (TRM) as described in NERC Standard MOD-
39 008-1 for its Northern Intertie and West of Garrison E>W Paths. The description of how
40 BPA implements TRM can be found in BPA's TRM Implementation Document (TRMID), found
41 on BPA's website. BPA does not maintain TRM for any other ATC Path.

42 Methodologies Not Applicable to BPA

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

46 ATC Calculations

47 ATC Calculation Periods

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

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

57 Frequency of ATC Recalculation

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

- 60 • Hourly, at least once per hour. (MOD-001 R8.1)
- 61 • Daily, at least once per day. (MOD-001 R8.2)
- 62 • Monthly, at least once per day. (MOD-001 R8.3)

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

66 Limiting Assumptions

67 BPA operates the Bulk Electric System within equipment and electric System thermal,
68 voltage, and Stability Limits so that instability, uncontrolled separation, or cascading
69 failures of the System will not occur as a result of a sudden disturbance or unanticipated
70 failure of the System elements. BPA has some paths that are only thermally limited and
71 some paths that move between being thermally limited and stability limited depending on
72 the outage or System conditions. For those paths that move between being stability
73 limited⁴ and thermally limited, the System conditions for such paths determine the type
74 of limitation and which section of this document applies for the duration of the System
75 conditions.

76 Stability Limited Paths

77 BPA studies assumptions of various System conditions to develop the System Operating
78 Limits (SOLs) for its planning of operations. Paths are stability limited when the Stability
79 Limit is lower than the thermal limit. When this is the case BPA uses the SOL as the TTC in
80 its ATC calculations. Therefore when determining the TTC, BPA uses studied assumptions
81 that are no more limiting than those used to determine the SOLs in its planning of
82 operations for the corresponding time period, when such planning of operations has been
83 performed for that time period. (MOD-001 R6)

84 When calculating ATC, BPA subtracts its Existing Transmission Commitments (ETC) from
85 the TTC determined from the studied assumptions that BPA uses to develop SOLs for its
86 planning of operations. No additional studies beyond those developed to determine SOLs
87 and used in calculating TTCs are performed to calculate ATC. BPA may use more recent
88 System condition information in its SOL calculations when the studies are updated after
89 the ETC Cases are performed. However, this is not considered a difference in
90 assumptions. Therefore, there are no different assumptions used to calculate ATC to
91 compare to assumptions used in BPA's planning of operations. (MOD-001 R7)

⁴ Stability limited paths may include COI; North of John Day; North of Hanford, N-S; West of Garrison; Northern Intertie; West of Cascades North; West of Cascades South.

92 Thermally Limited Paths

93 BPA studies assumptions of various system conditions to develop TTCs for thermally
94 limited paths. When determining the path TTC, BPA studies assumptions that are no more
95 limiting than those used in its planning of operations studies for the corresponding time
96 period, when such planning of operations has been performed for that time period. (MOD-
97 001 R6)

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

103 IV. Allocation Processes

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

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

121 V. Outages

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

124 Outage Planning

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

127 Outage Criteria for TTC Calculations

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

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

137 VI. Priorities Used to Set TTC

138 Stability Limited Paths

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

- 146 • **Real-time limit (highest priority):** The “Real-time limit” priority governs when BPA
147 updates the assumptions of system conditions to calculate SOLs during the Real-time
148 horizon. A change to the SOL calculation with the Real-time priority governs all other
149 priorities. For example, if BPA receives an update that a scheduled outage will be
150 extended by two hours early in the Real-time day, BPA will update the assumptions for
151 the SOL calculation accordingly for the additional two hours and may use those same
152 updated assumptions to update the TTC. If there are multiple real-time updates to
153 assumptions for SOL calculations, the most recent SOL calculated governs.
- 154 • **Scheduling limit:** The “scheduling limit” priority may be used occasionally when the
155 assumptions for the SOL are not governing or an actual scheduling limit has been
156 imposed. If there is more than one scheduling limit, the lowest scheduling limit
157 governs until a Real-time limit SOL is submitted.
- 158 • **Pre-schedule forecast:** The “pre-schedule forecast” SOL priority may be used for a
159 Path if the assumptions for the SOL calculations are updated for the pre-schedule
160 period. For example, for SOLs calculated for Network Paths that are derived using
161 nomograms, if the assumptions are re-evaluated just prior to the pre-schedule day to
162 incorporate updated data inputs, the TTC may be updated. The pre-schedule forecast
163 TTC governs over the ‘studied’ priority.
- 164 • **Studied:** The “studied” priority is used when there are outages where a study report
165 has been issued, including those provided by other TOPs. For example, if a study
166 report is issued evaluating assumptions for line outage system conditions, the SOLs in
167 that report govern over any lower-priority SOLs for the duration of the line outage
168 conditions.

- 169 • **Estimated known limit:** The “estimated known limit” priority is used to establish
170 unstudied TTCs or to define seasonal Path TTCs that govern over “short-term
171 seasonal” or “Path Rating” priorities.
- 172 • **Short-term seasonal:** The “short-term seasonal” priority is used for TTCs issued for
173 seasonal Path Ratings. As these Ratings may be higher at certain times during the
174 year, the short-term seasonal priority governs over the Path Rating priority. For
175 example, if the longer-term Path Rating for a path is 7800 MW, but seasonally this
176 Rating increases to 8000 MW, the short-term seasonal Rating of 8000 MW governs and
177 is used to set the TTC during the season to which it applies.
- 178 • **Path Rating:** The “Path Rating” priority is used to set base TTCs using either the
179 Rating of the Paths, SOLs studied using normal conditions, SOLs calculated for the
180 planning horizon, or all of the above. The lowest value resulting from the above
181 calculations governs for the given time period and is used to set the TTC. For
182 example, if under normal conditions the SOL for a path is 4410 MW, but the SOL
183 calculated for the planning horizon is 4100 MW, the lower SOL of 4100 MW governs and
184 is used to set the TTC for this Network Path.
- 185 • **Informational limit (lowest priority):** The “informational limit” is used while
186 establishing the initial setup of Paths within the scheduling and reservation system.
187 The informational limit is equal to the initial Path Rating of the Path.

188 Thermally Limited Paths

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

- 196 • **Real-time limit (highest priority):** The “Real-time limit” priority governs when BPA
197 updates the assumptions of system conditions to calculate TTCs during the Real-time
198 horizon. A change to the TTC calculation with the Real-time priority governs all other
199 priorities. For example, if BPA receives an update that a scheduled outage will be
200 extended by two hours early in the Real-time day, BPA may update the TTC.
- 201 • **Scheduling limit:** The “scheduling limit” priority may be used occasionally when the
202 assumptions for the TTC are not governing or an actual scheduling limit has been
203 imposed. If there is more than one scheduling limit, the lowest scheduling limit
204 governs until a Real-time limit TTC is submitted.
- 205 • **Pre-schedule forecast:** The “pre-schedule forecast” TTC priority may be used for a
206 Path if the assumptions for the TTC calculations are updated for the pre-schedule
207 period. For example, for TTCs calculated for Network Paths that are derived using
208 nomograms, if the assumptions are re-evaluated just prior to the pre-schedule day to
209 incorporate updated data inputs, the TTC may be updated. The pre-schedule forecast
210 TTC governs over the ‘studied’ priority.

- 211 • **Studied:** The “studied” priority is used when there are outages where a study report
212 has been issued, including those provided by other TOPs. For example, if a study
213 report is issued evaluating assumptions for line outage system conditions, the TTCs in
214 that report govern over any lower-priority TTCs for the duration of the line outage
215 conditions.
- 216 • **Estimated known limit:** The “estimated known limit” priority is used to establish
217 unstudied TTCs or to define seasonal Path TTCs that govern over “short-term
218 seasonal” or “Path Rating” priorities.
- 219 • **Short-term seasonal:** The “short-term seasonal” priority is used for TTCs issued for
220 seasonal Path Ratings. As these Ratings may be higher at certain times during the
221 year, the short-term seasonal priority governs over the Path Rating priority. For
222 example, if the longer-term Path Rating for a path is 7800 MW, but seasonally this
223 Rating increases to 8000 MW, the short-term seasonal Rating of 8000 MW governs and
224 is used to set the TTC during the season to which it applies.
- 225 • **Path Rating:** The “Path Rating” priority is used to set base TTCs using either the
226 Rating of the Paths, TTCs studied using normal conditions, TTCs calculated for the
227 planning horizon, or all of the above. The lowest value resulting from the above
228 calculations governs for the given time period and is used to set the TTC. For
229 example, if under normal conditions the TTC for a Path is 4410 MW, but the TTC
230 calculated for the planning horizon is 4100 MW, the lower TTC of 4100 MW governs and
231 is used to set the TTC for this Network Path.
- 232 • **Informational limit (lowest priority):** The “informational limit” is used while
233 establishing the initial setup of Paths within the scheduling and reservation system.
234 The informational limit is equal to the initial Path Rating of the Path.

235 VII. Rated System Path Methodology

236 This section describes in detail how BPA implements the Rated System Path methodology for
237 the Paths listed in Table 1. It addresses all of the Requirements in Standard MOD-029-1a.

238 BPA Paths

239 The following table shows the Paths for which BPA uses the Rated System Path methodology.

240 Table 1

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)
West of Hatwai On OASIS: WOH_E>W	(E>W)
Montana-Northwest West of Garrison On OASIS: WOGARR_E>W	(E>W)

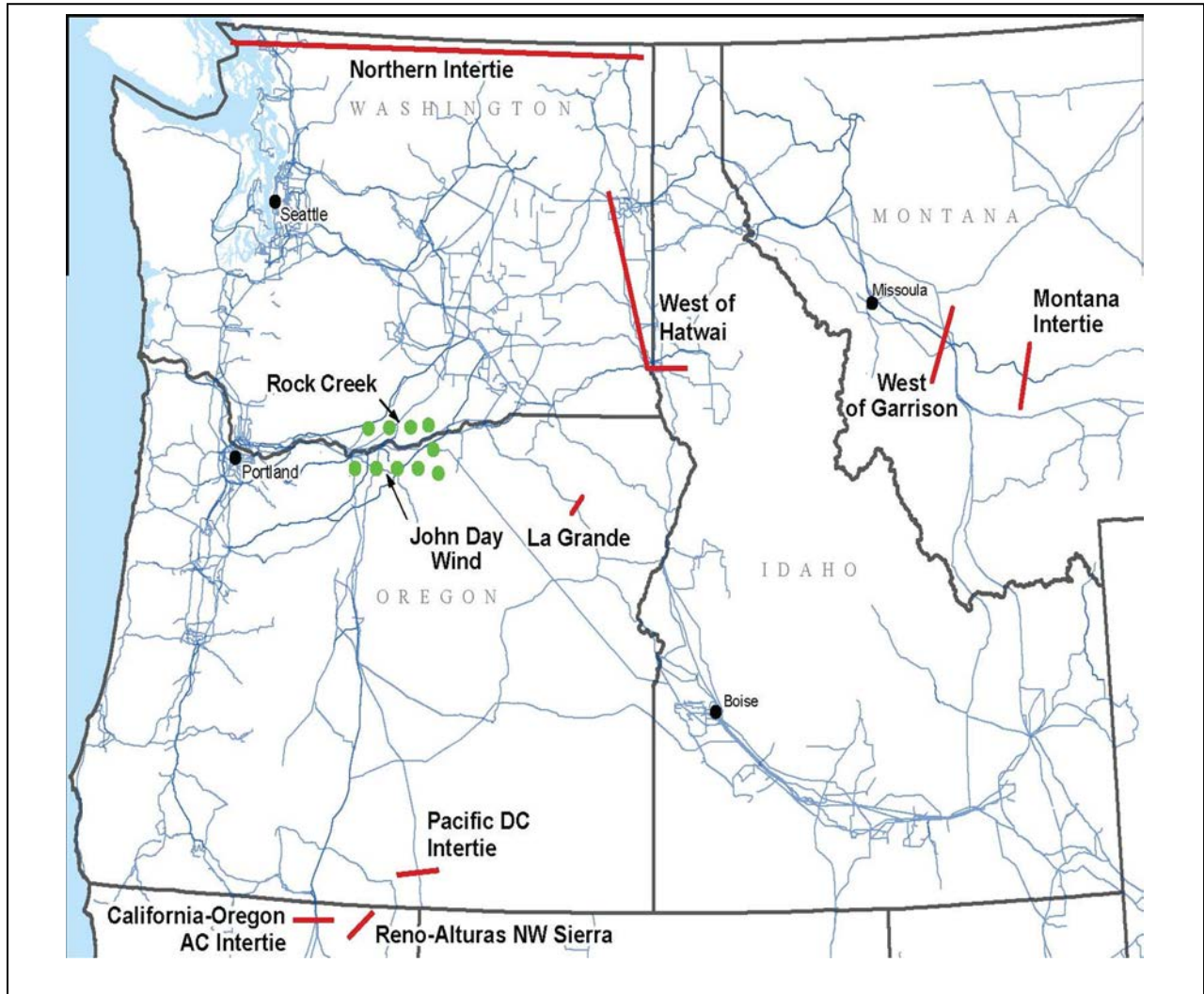
Path Name	Direction
Montana-Northwest West of Garrison On OASIS: WOGARR_W>E	(W>E)
La Grande On OASIS: LAGR_W>E	(W>E)
La Grande On OASIS: LAGR_E>W	(E>W)
Montana Intertie On OASIS: MI_E>W	(E>W)
Reno-Alturas NW Sierra On OASIS: RATS_N>S	(N>S)
Reno-Alturas NW Sierra On OASIS: RATS_S>N	(S>N)
California-Oregon 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

241

242 The following map shows the general geographic locations of the Paths listed in Table 1,
243 above.

244
245

Figure 1
BPA Paths Map



246

247 BPA will select Rated System Path Methodology if new ATC Paths are identified and
248 implemented. Table 1 will be updated to reflect the new ATC Paths. (MOD-001 R1)
249 Calculating Total Transfer Capability (TTC)

250 Data and Assumptions

251 When calculating TTC for its ATC Paths, BPA uses WECC base cases that utilize data and
252 assumptions consistent with the time period being studied. (MOD-029 R1.1) In addition to
253 BPA's TOP area, these WECC base cases model the entire Western Interconnection.
254 Hence, the WECC base cases include all TOP areas regardless if they are either contiguous
255 to BPA's TOP area or are linked to BPA's TOP area by a joint operating Agreement. (MOD-
256 029 R1.1.1.2, R1.1.1.3)

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

- 258 • Avista Corporation (AVA)
- 259 • BC Hydro (BCH)
- 260 • California Independent System Operator (CAISO)
- 261 • City of Tacoma, Department of Public Utilities, Light Division
- 262 • Eugene Water and Electric Board (EWEB)
- 263 • Idaho Power Company (IPCO)
- 264 • Los Angeles Department of Water and Power (LADWP)
- 265 • NorthWestern Energy (NWMT)
- 266 • Sierra Pacific (doing business as NV Energy)
- 267 • PacifiCorp (PAC)
- 268 • Pend Oreille County Public Utility District No. 1
- 269 • Portland General Electric (PGE)
- 270 • Public Utility District No. 1 of Chelan County
- 271 • Public Utility District No. 1 of Clark County
- 272 • Public Utility District No. 1 of Snohomish County
- 273 • Public Utility District No. 2 of Grant County, Washington
- 274 • PUD No. 1 of Douglas County
- 275 • Puget Sound Energy, Inc. (PSEI)
- 276 • Seattle City Light (SCL)

277 BPA uses the following data and assumptions in the WECC base cases when calculating
278 TTCs for its ATC Paths:

279 BPA models all existing System Elements in their normal operating condition for the
280 assumed initial conditions, up to the time horizon in which BPA begins modeling
281 outages (see Section V, "Outages," beginning on p. 6). (MOD-029 R1.1.2)

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

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

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

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

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

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

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

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

305 For West of Garrison, for the seasons or time periods in which the seasonal studies
306 have not been completed, the most recent year's seasonal study results will be used
307 for setting the TTC for the relevant Path. For all time periods, when there are no
308 studied outages, BPA uses a TTC of 2000 MW E>W and the maximum value from the
309 relevant studies to set the seasonal TTC of the Path W>E.

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

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

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

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

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

327 **Process to Determine TTC**

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

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

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

335 When modeling contingencies for stability limited paths, refer to the current version of
336 "Peak Reliability System Operating Limits Methodology for the Operations Horizon"
337 (PeakRC SOL Methodology) posted on Peak Reliability's website <https://www.peakrc.com>
338 for a detailed description of how BPA determines SOLs used to set TTCs. (MOD-029 R2.1.2)

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

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

349 For paths: West Of Hatwai, Columbia Injection, Wanapum Injection, South Of Custer-
350 North Of Echo Lake, South Of Boundary, West Of Lower Monumental, North of John Day,
351 and the Montana Intertie;

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

353 For paths: Paul-Allston, Raver-Paul, West Of McNary, West Of Slatt, and West Of John
354 Day;

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

356 For West of McNary also address North of John Day as follows;

357 Use the non-RAS TTC as the non-prevailing flow direction TTC for West of McNary.
358 The non-prevailing direction TTC for North of John Day is based on the TTC
359 addressed in the COI/PDCI study for this time period.

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

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

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

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

379 BPA does not have any ATC Paths whose Ratings were established, known, and used in
380 operation since January 1, 1994. (MOD-029 R2.7)

381 BPA creates a study report that describes the TTC applicable to the outages during the
382 studied time period and includes the limiting Contingencies and the limiting cause for the
383 calculated TTC. The PeakRC SOL Methodology document (PeakRC SOL Methodology posted
384 at: <https://www.peakrc.com>) defines the steps taken and assumptions BPA used to
385 determine TTC for each stability limited ATC path. BPA creates a study report for each
386 study it performs. The study report relies on the basic assumptions included in PeakRC
387 SOL methodology and identifies any changes to those basic assumptions. (MOD-029 R2.8)

388 As described in Section III, "Overview," information regarding TTCs is shared electronically
389 between the appropriate BPA organizations within seven calendar days of the finalization of
390 the study report for the TTCs. BPA sends a notice to all TSPs for the ATC Paths listed in Table
391 1 where there are multiple TSPs *prior* to limitations in TTCs. (MOD-029 R4)

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

397 http://transmission.bpa.gov/business/atc_methodology/

398 An ATC Path for which BPA does not perform studies to determine the most current value of
399 TTC is Reno - Alturas NW Sierra (RATS). For RATS, NV Energy determines TTC. The TTC
400 Ratings are provided to BPA and BPA then sends a Notice of Planned Path Limitation. (MOD-
401 029 R3)

402 **Calculating Firm Transmission Service**

403 **Calculating Firm Existing Transmission Commitments (ETC_F)**

404 When calculating ETC_F for all time periods for its ATC Paths, BPA uses the following
405 algorithm as specified in MOD-029 R5:

$$406 \quad \mathbf{ETC_F = NL_F + NITS_F + GF_F + PTP_F + ROR_F + OS_F}$$

407 **Where:**

408 NL_F is the firm capacity set aside to serve peak Native Load forecast commitments for the
409 time period being calculated, to include losses and Load growth not otherwise included in
410 TRM or CBM.

411 BPA does not use the NL_F component of the ETC_F calculation for any of its ATC Paths.
412 All of BPA's firm Transmission obligations are included in contracts, Agreements and
413 obligations captured in the $NITS_F$, PTP_F and GF_F components of this algorithm.
414 Therefore BPA sets NL_F at zero for all of its ATC Paths for all time periods.

415 $NITS_F$ is the firm capacity reserved for Network Integration Transmission Service serving
416 Load, to include losses and Load growth.

417 For BPA's ATC Paths where $NITS_F$ commitments exist to serve Network Load outside
418 BPA's BAA, the firm capacity set aside for $NITS_F$ is equal to the Load forecast, which
419 includes losses and Load growth, minus generation outside BPA's BAA that is
420 designated to serve that Load. For BPA's ATC Paths where $NITS_F$ commitments exist to
421 serve Network Load inside BPA's BAA from a forecasted or designated network
422 resource that impacts the ATC Path, the firm capacity set aside for $NITS_F$ is equal to
423 the amount the resource is forecasted/designated for.

424 GF_F is the firm capacity set aside for grandfathered Transmission Service and contracts for
425 energy and/or Transmission Service, where executed prior to the effective date of BPA's
426 Open Access Transmission Tariff (OATT).

427 The amount of GF_F BPA sets aside is based on the terms of each individual contract.

428 PTP_F is the firm capacity reserved for confirmed Point-to-Point Transmission Service and
429 is equal to the sum of the PTP_F contract Demands.

430 In BPA's calculations, PTP_F is equal to the sum of the MW Demands of PTP_F
431 reservations or schedules. In some cases, BPA has PTP_F contracts that give customers
432 the right to schedule between multiple Points of Receipt (PORs) and Points of Delivery
433 (PODs). However, the customer can only schedule up to the MW amount specified in
434 their contract. Multiple reservations are created for these special cases to allow BPA
435 to model each POR-to-POD combination. The amount set aside for these cases does
436 not exceed the total PTP_F capacity specified in the contracts.

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

441 BPA assumes that all of its Transmission Service Agreements eligible to roll-over in the
442 future will be rolled over. Therefore, ROR_F is equal to the sum of the $NITS_F$, GF_F and
443 PTP_F obligations that are eligible for roll-over rights. If a Transmission Customer
444 chooses not to exercise its roll-over rights by the required deadline, BPA no longer
445 holds out capacity for roll-over rights for that Transmission Customer.

446 OS_F is the firm capacity reserved for any other service(s), contract(s), or Agreement(s) not
447 specified above using Firm Transmission Service.

448 BPA has no other services beyond those specified above. Therefore BPA sets OS_F at
449 zero for all of its ATC Paths for all time periods.

450 As a result, BPA calculates ETC_F for its ATC Paths for all time periods as follows:

451
$$\mathbf{ETC_F = NITS_F + GF_F + PTP_F + ROR_F}$$

452 While BPA includes all of the components described above in ETC_F , BPA accounts for $NITS_F$,
453 GF_F , PTP_F and ROR_F in its ATC calculations using different variables. Descriptions of the
454 variables for ATC_F calculations begin on p. 15 and for ATC_{NF} calculations, p.21.

455 Calculating Firm Available Transfer Capability (ATC_F)

456 When calculating ATC_F for its ATC Paths for all time periods, BPA uses the following
457 algorithm (MOD-029 R7):

458
$$\mathbf{ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + Counterflows_F}$$

459 Where:

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

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

462 See "Process to Determine TTC" beginning on p. 11, for a description of how BPA
463 determines TTC.

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

465 For ATC_F calculations for all time periods, BPA further divides ETC_F into the following
466 algorithm in order to capture both its firm Long-Term and Short-Term Reservations:

467
$$\mathbf{ETC_F = LRES + SRES + LETC - SAdj/ETC Adjustments}$$

468 Where:

469 LRES is the sum of the $NITS_F$, PTP_F , ROR_F and GF_F Long-Term Reservations.

470 SRES is the sum of the PTP_F Short-Term Reservations.

471 LETC is used to make two different adjustments to ETC_F . The first adjustment is
472 made to ensure that the amount of PTP_F capacity BPA sets aside in the LRES
473 variable for contracts where BPA gives customers the right to schedule the
474 capacity reserved between multiple PORs and PODs does not exceed the total PTP_F
475 capacity specified in those contracts.

476 The second adjustment is made only on the West of Hatwai E>W Path. On this ATC
477 Path, BPA uses LETC to hold out $NITS_F$ capacity for the Western Montana hydro
478 projects (Albeni Falls, Libby, Hungry Horse and Dworshak) located east of West of
479 Hatwai to serve Network Load west of West of Hatwai, since no reservation exists
480 for this $NITS_F$ obligation.

481 **SADJ/ETC Adjustments** is the variable BPA uses to make adjustments to ETC_F not
 482 captured in LRES or SRES. On the West of Garrison Path, BPA has two PTP_F Long-
 483 Term Reservations, captured in LRES, that hold out capacity in the E>W direction.
 484 However, the energy associated with these reservations is affected by a parallel
 485 path and flows in the W>E direction as well. SADJ/ETC Adjustments is used to hold
 486 out capacity in the W>E direction to accurately account for this flow as an ETC_F
 487 adjustment.

488 BPA applies another such adjustment to allow for deferral competitions, as
 489 required in Section 17.7 of BPA's OATT. When a deferral reservation is confirmed,
 490 BPA applies an ETC adjustment to hold out transfer capability for the time period
 491 deferred, starting at the latter of five months out or the service commencement
 492 date of the original reservation, to allow for a competition. At four months out, if
 493 no competition is identified, the ETC adjustment is modified to post back transfer
 494 capability for the fourth month out.

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

498 The following diagram illustrates how the variables used in BPA's ETC_F calculations
 499 correspond to the variables contained in the ETC_F algorithm shown in "Calculating
 500 Firm Existing Transmission Commitments" beginning on p. 13.

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

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

502 BPA does not maintain CBM. Therefore BPA sets CBM at zero for all of its ATC
 503 Paths for all time periods.

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

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

507 **Postbacks_F** are changes to ATC_F due to a change in the use of Transmission Service
 508 for that period.

509 Because BPA automatically recalculates ETC_F whenever there is a reduction in LRES
510 or SRES, BPA does not use $Postbacks_F$ for calculating ATC_F on any of its ATC Paths.
511 Therefore BPA sets $Postbacks_F$ at zero for all of its ATC Paths for all time periods.

512 **Counterflows_F** are adjustments to ATC_F .

513 BPA does not include confirmed Transmission reservations, expected interchange
514 or internal flow counter to the direction of the ATC Path being calculated in its
515 ATC_F calculations. BPA's rationale is that it does not want to offer firm transfer
516 capability due to counterflow that may not be scheduled as this could lead to
517 Curtailments of Firm Transmission Service in the Real-time horizon. (MOD-001
518 R3.2) Therefore BPA sets $Counterflows_F$ at zero for all of its ATC Paths for all time
519 periods.

520 As a result, BPA calculates ATC_F for all of its ATC Paths, except the Northern Intertie
521 Path, for all time periods as follows:

522
$$ATC_F = TTC - ETC_F$$

523 BPA calculates ATC_F for the Northern Intertie Path for all time periods as follows:

524
$$ATC_F = TTC - ETC_F - TRM$$

525 Calculating Non-Firm Transmission Service

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

- 527 1. **NITS_{NF6}**. This is a non-firm Transmission product available only to Transmission
528 Customers with NITS Agreements. It is the highest quality of Non-Firm Transmission
529 Service in that it is the last Non-Firm Transmission Service that would be Curtailed, if
530 necessary.
- 531 2. **PTP_{NF5}**. This is a non-firm Transmission product available only to Transmission
532 Customers with PTP service Agreements. PTP_{NF5} is the fifth Non-Firm Transmission
533 Service that would be Curtailed, if necessary.
- 534 3. **PTP_{NF4}**. This is a non-firm Transmission product available only to Transmission
535 Customers with PTP service Agreements. PTP_{NF4} is the fourth Non-Firm Transmission
536 Service that would be Curtailed, if necessary.
- 537 4. **PTP_{NF3}**. This is a non-firm Transmission product available only to Transmission
538 Customers with PTP service Agreements. PTP_{NF3} is the third Non-Firm Transmission
539 Service that would be Curtailed, if necessary.
- 540 5. **PTP_{NF2}**. This is a non-firm Transmission product available only to Transmission
541 Customers with PTP service Agreements. PTP_{NF2} is the second Non-Firm Transmission
542 Service that would be Curtailed, if necessary.

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

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

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

549 BPA calculates ETC_{NF} for all time periods for an ATC Path using the following algorithm as
550 specified in MOD-029 R6:

$$551 \quad \mathbf{ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}}$$

552 **Where:**

553 $NITS_{NF}$ is the non-firm capacity set aside for Network Integration Transmission Service
554 serving Load (i.e., secondary service), to include losses and Load growth not otherwise
555 included in TRM or CBM.

556 In BPA's calculations, this is $NITS_{NF6}$. It does not include losses or Load growth, since
557 losses and Load growth are already set aside as firm capacity in $NITS_F$.

558 GF_{NF} is the non-firm capacity set aside for grandfathered Transmission Service and
559 contracts for energy and/or Transmission Service, where executed prior to the effective
560 date of BPA's OATT.

561 BPA has no grandfathered Non-Firm Transmission Service obligations. Therefore BPA
562 sets GF_{NF} at zero for all of its ATC Paths for all time periods.

563 PTP_{NF} is non-firm capacity reserved or scheduled for confirmed PTP Transmission Service.

564 In BPA's calculations, this includes PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and PTP_{NF1} .

565 OS_{NF} is the non-firm capacity reserved for any other service(s), contract(s), or
566 Agreement(s) not specified above using Non-Firm Transmission Service.

567 BPA has no other services beyond those specified above. Therefore BPA sets OS_{NF} at
568 zero for all of its ATC Paths for all time periods.

569 As a result, BPA calculates ETC_{NF} for its ATC Paths for all time periods as follows:

$$570 \quad \mathbf{ETC_{NF} = NITS_{NF} + PTP_{NF}}$$

571 While BPA includes all of the components described above in ETC_{NF} , BPA accounts for $NITS_{NF}$
572 and PTP_{NF} in its ATC_{NF} calculations using different variables. A description of the variables
573 used begins on p.20.

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

575 BPA uses different algorithms to calculate ATC_{NF}, ETC_F, ETC_{NF} and Postbacks_{NF} for two time
576 horizons for all of its ATC Paths: Real-time and beyond Real-time. The Real-time horizon
577 begins at 10 p.m. on the pre-schedule day for the 24 hours in the next day. ETC_F and ETC_{NF}
578 for the Real-Time horizon are calculated using schedules and reservations that have not yet
579 been scheduled. The beyond Real-time horizon includes hourly for the hours after those
580 included in the Real-time period as well as daily and monthly calculations. ETC_F and ETC_{NF} for
581 the time horizon beyond Real-time are calculated using reservations.

582 BPA calculates ETC_{NF} and ATC_{NF} for the six non-firm Transmission products associated with
583 NERC Curtailment priorities (described on p.20) as follows:

- 584 1. **ATC_{NF6}**: ATC_{NF6} is calculated for the NITS_{NF6} product. ETC_{NF} in this equation only
585 includes NITS_{NF6}.
- 586 2. **ATC_{NF5}**: ATC_{NF5} is calculated for the PTP_{NF5} product. ETC_{NF} in this equation includes
587 NITS_{NF6} and PTP_{NF5}.
- 588 3. **ATC_{NF4}**: ATC_{NF4} is calculated for the PTP_{NF4} product. ETC_{NF} in this equation includes
589 NITS_{NF6}, PTP_{NF5} and PTP_{NF4}.
- 590 4. **ATC_{NF3}**: ATC_{NF3} is calculated for the PTP_{NF3} product. ETC_{NF} in this equation includes
591 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, and PTP_{NF3}.
- 592 5. **ATC_{NF2}**: ATC_{NF2} is calculated for the PTP_{NF2} product. ETC_{NF} in this equation includes
593 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, PTP_{NF3} and PTP_{NF2}.
- 594 6. **ATC_{NF1}**: ATC_{NF1} is calculated for the PTP_{NF1} product. ETC_{NF} in this equation includes
595 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, PTP_{NF3}, PTP_{NF2} and PTP_{NF1}.

596 The following section describes how BPA calculates ATC_{NF} for each time period.

597 When calculating ATC_{NF} for its ATC paths for the two time horizons described above, BPA uses
598 the following algorithm as specified in MOD-029 R8:

599
$$\mathbf{ATC}_{NF} = \mathbf{TTC} - \mathbf{ETC}_F - \mathbf{ETC}_{NF} - \mathbf{CBM}_S - \mathbf{TRM}_U + \mathbf{Postbacks}_{NF} + \mathbf{Counterflow}_{NF}$$

600 **Where:**

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

602 As previously described, BPA calculates six ATC_{NF} values, one for each of its six non-firm
603 Transmission products.

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

605 See "Calculating Total Transfer Capability" beginning on p. 13 for a description of BPA's
606 process to determine TTC.

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

608 BPA uses different algorithms to calculate ETC_F for all of its ATC Paths for the time
609 horizon beyond Real-time and the Real-time horizon.

610 ETC_F for the Time Horizon Beyond Real-Time

611 For ATC_{NF} calculations for the time horizon beyond Real-time, BPA further divides ETC_F
612 into the following algorithm in order to capture both its firm Long-Term and Short-Term
613 Reservations:

$$614 \quad \text{ETC}_F = \text{LRES} + \text{SRES} - \text{SADJ/ETC Adjustments} + \text{LETC}$$

615 Where:

616 LRES is the sum of the NITS_F, PTP_F, ROR_F and GF_F Long-Term Reservations.

617 SRES is the sum of the PTP_F Short-Term Reservations.

618 SADJ/ETC Adjustments is the variable used to make adjustments to ETC_F not captured in
619 LRES or SRES. On the West of Garrison Path, BPA has two PTP_F reservations, captured in
620 LRES, that hold out capacity in the E>W direction. However, the energy associated with
621 these reservations is affected by a parallel path and flows in the W>E direction as well.
622 SADJ/ETC Adjustments is used to hold out capacity in the W>E direction to accurately account
623 for this flow as an ETC_F adjustment.

624 BPA applies another such adjustment to allow for deferral competitions, as required in
625 Section 17.7 of BPA's OATT. When a deferral reservation is confirmed, BPA applies an ETC
626 adjustment to hold out transfer capability for the time period deferred, starting at the latter
627 of five months out or the service commencement date of the original reservation, to allow for
628 a competition. At four months out, if no competition is identified, the ETC adjustment is
629 modified to add back transfer capability for the fourth month out.

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

633 LETC is used to make two different adjustments to ETC_F. The first adjustment is made to
634 ensure that the amount of PTP_F capacity BPA sets aside in the LRES variable for contracts
635 where BPA gives customers the right to schedule the capacity reserved between multiple
636 PORs and PODs does not exceed the total PTP_F capacity specified in those contracts.

637 The second adjustment is made only on the West of Hatwai E>W Path. On this ATC Path BPA
638 uses LETC to hold out NITS_F capacity for the Western Montana hydro projects (Albeni Falls,
639 Libby, Hungry Horse and Dworshak) located east of West of Hatwai to serve Network Load
640 west of West of Hatwai, since no reservation exists for this NITS_F obligation.

641 The following diagram illustrates how the variables used in BPA's ETC_F calculation correspond
642 to the variables contained in the ETC_F algorithm shown in "Calculating Firm Existing
643 Transmission Commitments" beginning on p.13.

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

644 ETC_F for the Real-Time Horizon

645 For ATC_{NF} calculations for the Real-time horizon, ETC_F is expressed as follows:

646
$$\text{ETC}_F = \text{SCH}_7^+ + \text{ASC}_7^+ + \text{RADJ/ETC Adjustment}$$

647 Where:

648 SCH₇⁺ is the sum of the positive schedules that reference confirmed NITS_F, GF_F and
649 PTP_F reservations for the ATC Path for that period.

650 ASC₇⁺ is the sum of the positive dynamic schedules that reference confirmed NITS_F,
651 GF_F and PTP_F reservations for the ATC Path for that period.

652 RADJ/ETC Adjustment is used to adjust hourly ETC_F on the West of Hatwai E>W Path to
653 account for a NITS_F obligation (note that this obligation is accounted for in LETC in the time
654 horizon beyond Real-time). The adjustment is equal to the difference between the BPA BAA
655 Load estimate east of West of Hatwai and the average MW output of the western Montana
656 hydro projects (Albeni Falls, Libby, Hungry Horse, Dworshak), located east of West of Hatwai.
657 When this value changes +/- 50 MW in the Real-time horizon based on a change in the
658 generation and Load estimates, for any given hour, BPA updates this ETC adjustment to
659 reflect the new hourly value.

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

662 The following diagram illustrates how the variables used in BPA's ETC_F calculation correspond
663 to the variables contained in the ETC_F algorithm shown in "Calculating Firm Existing
664 Transmission Commitments" beginning on p.13. ROR_F is not included in ETC_F for the Real-
665 time horizon because ROR_F is not relevant for the Real-time horizon.

ETC_F =	NITS_F	+	GF_F	+	PTP_F
	↓		↓		↓
	SCH₇⁺		SCH₇⁺		SCH₇⁺
	+		+		+
	ASC₇⁺		ASC₇⁺		ASC₇⁺
	+		+		+
	RADJ/ETC Adjustment		RADJ/ETC Adjustment		RADJ/ETC Adjustment

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

667 BPA uses different algorithms to calculate ETC_{NF} for all of its ATC Paths for the time horizon
668 beyond Real-time and the Real-time horizon.

669 **ETC_{NF} for the Time Horizon Beyond Real-Time**

670 For ATC_{NF} calculations in the time horizon beyond Real-time, ETC_{NF} is expressed as
671 follows:

672
$$\mathbf{ETC_{NF} = RRES_{6,5,4,3,2,1}}$$

673 **Where:**

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

676 The following diagram explains how the variables used in BPA’s ETC_{NF} calculation correspond
677 to the variables contained in the ETC_{NF} algorithm shown in “Calculating Non-Firm Existing
678 Transmission Commitments” beginning on p.20.

ETC_{NF} =	NITS_{NF}	+	PTP_{NF}
	↓		↓
	RRES_{6,5,4,3,2,1}		RRES_{6,5,4,3,2,1}

679 **ETC_{NF} for the Real-Time Horizon**

680 For ATC_{NF} calculations in the Real-time horizon, ETC_{NF} is expressed as follows:

681
$$\mathbf{ETC_{NF} = SCH_{6,5,4,3,2,1}^+ + ASC_{6,5,4,3,2,1}^+}$$

682 Where:

683 $SCH^+_{6,5,4,3,2,1}$ is the sum of the positive Demands of schedules referenced to
684 confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and PTP_{NF1} reservations, plus
685 the sum of the positive Demands of confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} ,
686 PTP_{NF2} and PTP_{NF1} reservations that have not yet been scheduled. Once these
687 reservations are scheduled, the schedule is used for ETC_{NF} , thereby adding back
688 the difference between the reservation and schedule amounts to ATC_{NF} .

689 $ASC^+_{6,5,4,3,2,1}$ is the sum of positive Demands of dynamic schedules referenced
690 to confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and PTP_{NF1} reservations for
691 the ATC Path.

692 The following diagram explains how the variables used in BPA's ETC_{NF} calculation correspond
693 to the variables contained in the ETC_{NF} algorithm shown in "Calculating Non-Firm Existing
694 Transmission Commitments" beginning on p.20.

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

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

697 BPA does not maintain CBM_S . Therefore BPA sets CBM_S at zero for all of its ATC Paths for
698 all time periods.

699 TRM_U is the Transmission Reliability Margin for the ATC Path that has not been released for
700 sale as non-firm capacity during that period.

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

703
704 $Postbacks_{NF}$ are changes to non-firm Available Transfer Capability due to a change in the use
705 of Transmission Service for that period.

706 BPA uses different algorithms to calculate $Postbacks_{NF}$ for all of its ATC Paths for the time
707 horizon beyond Real-time and the Real-time horizon.

708 $Postbacks_{NF}$ for the Time Horizon Beyond Real-time

709 BPA does not use $Postbacks_{NF}$ for calculating ATC_{NF} for any of the ATC Paths for the
710 time horizon beyond Real-time. Therefore BPA sets $Postbacks_{NF}$ at zero for all of its
711 ATC Paths for the time horizon beyond Real-Time.

712 **Postbacks_{NF} for the Real-time Horizon**
 713 For ATC_{NF} calculations in the Real-time horizon, there is a circumstance in which BPA
 714 uses Postbacks_{NF}, expressed as RADJ/ETC.

715 A postback is applied to the COI N>S Path. For its hourly COI N>S non-firm
 716 calculations, BPA posts back any unused share of non-firm capacity that is available to
 717 BPA by capacity ownership and other Agreements for the COI N>S, if needed to
 718 prevent Curtailments.

719 For all other ATC Paths, there are no other Postbacks expressed as RADJ/ETC.

720 **Counterflow_{NF}** are adjustments to ATC_{NF}.

721 Since a schedule provides assurance that the transaction will flow, all counterflow
 722 resulting from firm and non-firm Transmission schedules, excluding tag types dynamic
 723 and capacity, are added back to ATC_{NF} in the Counterflows_{NF} component. (MOD-001
 724 R3.2)

725 In BPA's ATC_{NF} calculations, Counterflows_{NF} is expressed as SCH_{7,6,5,4,3,2,1}, which is the
 726 sum of schedules flowing in the direction counter to the direction of the ATC Path.

727 As a result, BPA calculates ATC_{NF} for all of its ATC Paths, except the Northern Intertie Path,
 728 for all time periods as follows:

729
$$ATC_{NF} = TTC - ETC_F - ETC_{NF} + Postbacks_{NF} + Counterflows_{NF}$$

730 BPA calculates ATC_{NF} for its Northern Intertie Path for all time periods as follows:

731
$$ATC_{NF} = TTC - ETC_F - ETC_{NF} - TRM_U + Postbacks_{NF} + Counterflows_{NF}$$

732 In some cases, the amount of Counterflows_{NF} exceeds the sum of the ETC_F and ETC_{NF}, which,
 733 when added to TTC, results in ATC_{NF} greater than TTC.

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

737 VIII. Network Path Methodology

738 This section describes in detail how BPA implements the Rated System Path Methodology for
 739 the ATC Paths listed in Table 2. It addresses all of the requirements in Standard MOD-029-1a.

740 BPA Network Paths

741 The following table shows the Network Paths for which BPA uses the Rated System Path
 742 Methodology:

743
744

Table 2
BPA Network Paths

Network Path	Direction	Transmission Line Components
North of Hanford On OASIS: NOHANF	(N>S)	Vantage-Hanford 500kV; Grand Coulee-Hanford 500kV; and Shultz-Wautoma 500kV
North of Hanford On OASIS: NOHANF	(S>N)	Vantage-Hanford 500kV; Grand Coulee-Hanford 500kV; and Shultz-Wautoma 500kV
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
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
North of John Day On OASIS: NOJDAY	(N>S)	Ashe-Marion 500kV; Ashe-Slatt 500kV; Wautoma-Knight 500kV; Wautoma-Rock Creek 500kV; Raver-Paul 500kV; and Lower Monumental-McNary 500kV
Paul-Allston On OASIS: PAUL_ALSN	(N>S)	Napavine-Allston #1 500kV; and Paul-Allston #2 500kV
Raver-Paul	(N>S)	Raver-Paul 500 kV Line

Network Path	Direction	Transmission Line Components
On OASIS: RAVR_PAUL		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
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
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
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; and McNary-John Day #2 500kV
West of Slatt On OASIS: WOSLATT	(E>W)	Slatt-Buckley 500kV; and Slatt-John Day 500kV
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

Network Path	Direction	Transmission Line Components
		John Day – Marion No. 1 500kV
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
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)
Wanapum Injection On OASIS: WANAPM	(N>S)	Midway-Vantage #1 230-kV; and Midway-Priest Rapids #3 230-kV
West of Lower Monumental On OASIS: W_LOMO	(E>W)	Ashe – Lower Monumental 500kV; Hanford – Lower Monumental 500kV; and McNary – Lower Monumental 500kV
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
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

745

746 The following map shows the general geographic locations of the Network Paths listed in

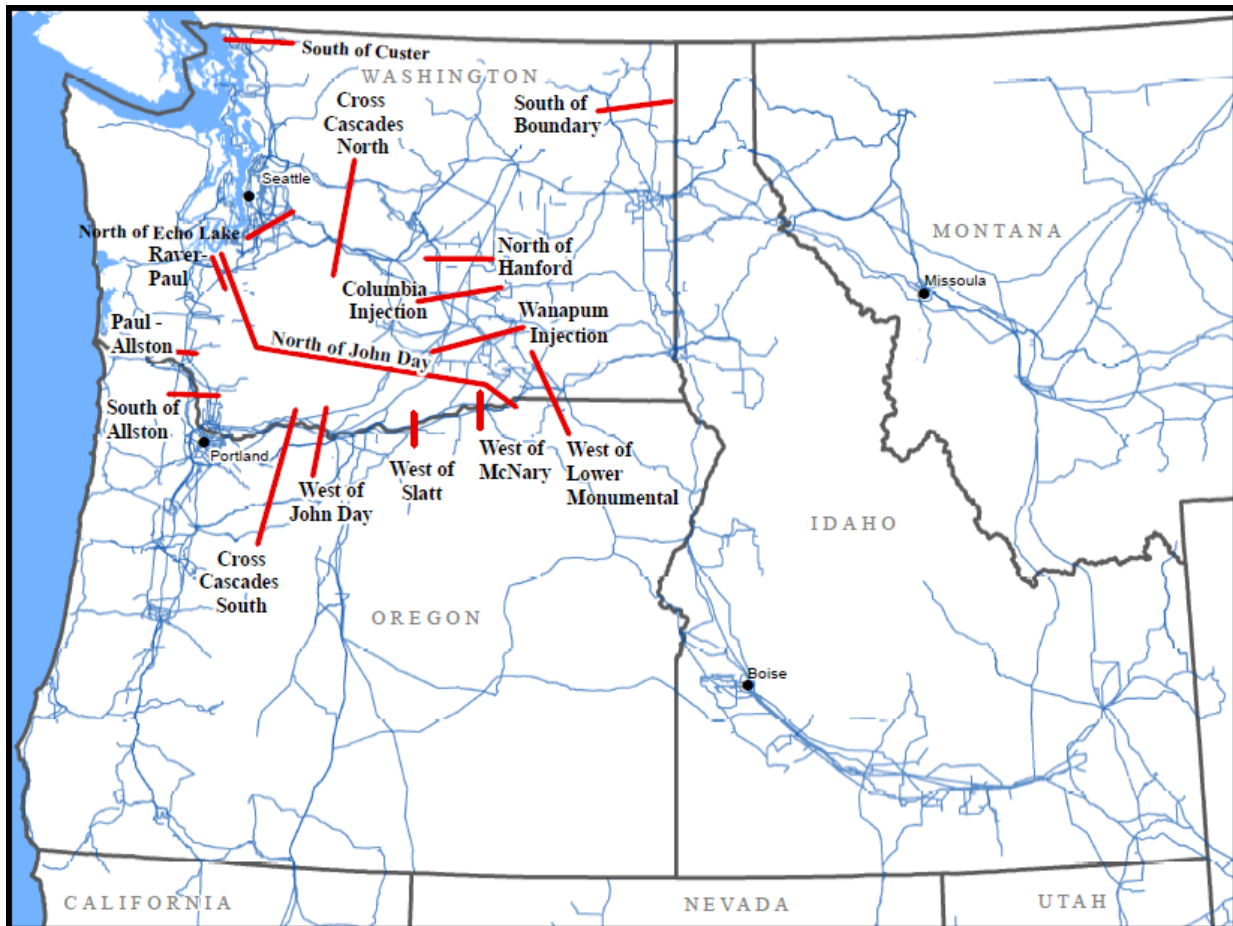
747 Table 2, above:

748

Figure 2

749

BPA Network Paths Map



750

751 **Establishing Total Transfer Capability (TTC)**

752 BPA calculates TTC for its Network Paths in the same manner as is described "Calculating
753 Total Transfer Capability (TTC) and Process to Determine (TTC)". See "Calculating Total
754 Transfer Capability" beginning on p. 13 for a description of BPA's process to determine TTC.

755 **Determining Existing Transmission Commitments (ETC)**

756 **Use of WECC Base Cases to Determine ETC**

757 BPA uses the WECC base cases and modifies them to calculate the ETC components of the
758 ATC calculations for its Network Paths. BPA refers to these base cases as ETC Cases. The
759 assumptions used in these ETC Cases include normal operating conditions, system
760 topology, a 1-in-2-year seasonal heavy Load forecast (or seasonal light Load forecast
761 depending on the Network Path being studied), and generation dispatches based on the
762 firm Transmission rights associated with specific generators.

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

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

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

777 The WECC base cases contain explicit modeling data and System topology for all
778 Facilities within the Peak RC Area, including AC Transmission Lines 115kV and above
779 and all DC Transmission Lines. Significant looped Transmission Lines rated at less
780 than 115 kV are also included in the WECC base cases.

781 The Peak RC Area covers the entire Western Interconnection and therefore does not
782 contain modeling data and System topology beyond the Peak RC Area.

783 BPA updates the relevant WECC base cases with equipment outages which are known and
784 mapped to the WECC base case, as well as newly-energized generation and Transmission
785 for ATC calculations at least once per day for intra-day, next day and days two through
786 30.

787 BPA updates the relevant WECC base cases with equipment outages which are known and
788 mapped to the WECC base case, as well as newly-energized generation and Transmission
789 for ATC calculations at least once per month for months two through 13.

790 **Outages in ETC Calculations**

791 Generation outages known to BPA at the time BPA creates its ETC Cases are incorporated
792 into the generation dispatch assumptions in the base cases. See "Determining Base ETC_{Fi}"
793 beginning on p. 36 for a description of how BPA develops its ETC Cases.

794 BPA adjusts the WECC base cases to include Transmission outages for BPA's area and all
795 adjacent TSP areas to calculate PTDFs, which are used in BPA's ETC calculations. Note
796 that BPA has no executed coordination Agreements with other TSPs. (MOD-001 R3.6)

797 **Outage Criteria in ETC Calculations**

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

801 Hourly ETC Calculations

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

806 Daily ETC Calculations

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

812 BPA includes generation and Transmission outages in daily ETC calculations beyond the
813 10- to 16-day planned outage study period if the outage is officially scheduled in BPA's
814 outage system.

815 Monthly ETC Calculations

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

820 PTDF Analysis and *De Minimis*

821 BPA determines the impact of ETC on its Network Paths using PTDF analysis. PTDF
822 analysis is the fraction of energy (expressed as a percentage or as a decimal) that will
823 flow across BPA's monitored Network Paths as that energy is injected at a POR (or source)
824 relative to a slack bus, and withdrawn at a POD (or sink) relative to a slack bus, for each
825 Network Path. The Network Path impacts are determined using the following formula:

$$826 \quad (\text{POR PTDF} - \text{POD PTDF}) * \text{Demand} = \text{MW impact to Network Path}$$

827 If a reservation's impact on a Network Path is less than or equal to 10 MW and the PTDF
828 difference is less than or equal to 10 percent of the reserved demand, the reservation is
829 deemed to have a *de minimis* impact on that Network Path. Ten percent is the
830 percentage used to curtail in the Western Interconnection-wide congestion management
831 procedure. When using reservations, BPA does not account for *de minimis* MW amounts in
832 its ETC calculations.

833 Source/POR and Sink/POD Identification and Mapping

834 In the ETC components of its Network Path ATC calculations, BPA accounts for source and
835 sink for Transmission Service through the following processes:

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

843 The source used in BPA's Network Path ATC calculations of transactions within BPA's
844 BAA is obtained from the POR field for Short-Term Reservations and the source field
845 for Long-Term Reservations, as shown on the TSR template in OASIS. The source used
846 in BPA's Network Path ATC calculations of transactions for all adjacent TSPs is
847 obtained from the source field if a source is identified, or the POR field if only the
848 POR is identified. BPA represents the impact of Transmission Service using the source
849 or POR as follows:

- 850 • If the source or POR has been identified in the reservation and is discretely
851 modeled in the WECC base cases, BPA uses the discretely modeled point as
852 the source.
- 853 • In cases where the source or POR has been identified in the reservation and
854 the point can be mapped to an "equivalent" or "aggregate" representation in
855 the WECC base cases, BPA maps the source to the equivalence point in the
856 WECC base cases. These points are published in the Transmission Service
857 Contract Points List on BPA's OASIS home page.
- 858 • If the source or POR has been identified in the reservation and the point
859 cannot be mapped to a discretely modeled point or an "equivalence"
860 representation in the WECC base cases, BPA uses the immediately adjacent
861 BA associated with the TSP from which the power is to be received as the
862 source.
- 863 • BPA requires a specified source or POR to be identified for all reservations.

864 The sink used in BPA's Network Path ATC calculations of transactions within BPA's
865 BAA is obtained from the POD field for Short-Term Reservations and the sink field for
866 Long-Term Reservations, as shown on the TSR template in OASIS. The sink used in
867 BPA's Network Path ATC calculations of transactions for all adjacent TSPs is obtained
868 from the sink field if a sink is identified, or the POD field if only the POD is
869 identified. BPA represents the impact of Transmission Service using the sink or POD
870 as follows:

- 871 • If the sink or POD has been identified in the reservation and is discretely
872 modeled in the WECC base cases, BPA uses the discretely modeled point as
873 the sink or POD.
- 874 • In cases where the sink or POD has been identified in the reservation and the
875 point can be mapped to an "equivalent" or "aggregate" representation in the
876 WECC base case, BPA maps the sink or POD to the equivalence points in the
877 WECC base cases. These points are published in the Transmission Service
878 Contract Points list on BPA's OASIS home page.

- 879 • If the sink or POD has been identified in the reservation and the point cannot
- 880 be mapped to a discretely modeled point or an “equivalence” representation
- 881 in the WECC base cases, BPA uses the immediately adjacent BA associated
- 882 with the TSP receiving the power as the sink or POD.
- 883 • BPA requires a specified sink or POD to be identified for all reservations.

884 BPA has grouped the FCRPS generators in BPA’s BAA and the Mid-Columbia generators based
 885 on the primary interface between BPA and the generation projects. These groupings are
 886 assigned weighted PTFDs that represent how the generators participate in the group. The
 887 weighted PTFDF for the FCRPS bus point is derived from a “weighted FCRTS” bus point. The
 888 PTFDF weighting for this point varies across different time periods. For the daily and monthly
 889 calculations beyond 16 days out, BPA derives the weighting of the PTFDF by applying the
 890 generation dispatch determined in the ETC Cases. For the hourly and daily calculations for
 891 the next hour out to day 16, the PTFDF weighting is derived from generation forecasts of the
 892 federal resources produced for that time period. BPA derives the PTFDF weighting for the Mid-
 893 Columbia bus point by applying the generation dispatch determined in the ETC Cases.

894 BPA has also grouped the FCRPS generators in the Idaho Power Company BAA based on the
 895 primary interface between Idaho Power Company and the generation projects. These
 896 groupings are assigned a weighted PTFDF that represent how the generators participate in the
 897 group and are used to evaluate transactions within and between adjacent BAAs that do not
 898 include BPAT. BPA derives the PTFDF weighting for this point by applying the generation
 899 dispatch determined in the ETC Cases. In the ETC Cases, these generators are modeled up to
 900 the long-term firm Transmission rights associated with the generators.

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

910 Calculating Firm Transmission Service

911 Calculating Firm Existing Transmission Commitments (ETC_{Fi})

912 When calculating the impact of ETC_{Fi} for all time periods for a Network Path, BPA uses the
 913 following algorithm. (MOD-029 R5)

$$914 \quad \text{ETC}_{Fi} = \text{NITS}_{Fi} + \text{PTP}_{Fi} + \text{ROR}_{Fi} + \text{GF}_{Fi} + \text{OS}_{Fi}$$

915 Where:

916 NITS_{Fi} is the impact of firm Network Integration Transmission Service, including
 917 impacts of generation to Load for BPA’s area. This impact is based on the Load
 918 forecasts for Network Service Load for the time period being calculated and the
 919 generation dispatch, which includes forecasted and designated network resources.

920 NITS_{Fi} also includes the impact of firm Network Integration Transmission Service,
921 including impacts of generation to Load for all of BPA's adjacent TSP areas. This
922 impact is based on the Load forecasts for Network Service Load for the time period
923 being calculated and the generation dispatch, which includes designated network
924 resources.

925 PTP_{Fi} is the impact of confirmed firm Point-to-Point Transmission Service expected to
926 be scheduled in BPA's area.

927 PTP_{Fi} also includes the impact of confirmed Point-to-Point Firm Transmission Service
928 expected to be scheduled for all of BPA's adjacent TSP areas.

929 There are no reservations using Transmission Service from multiple TSPs, and
930 therefore no duplicate impacts, since reservations source and sink within the same
931 TSP's area. A separate reservation is required to acquire Transmission Service over
932 another TSP's area. When using schedules, BPA includes all schedules for all of its
933 adjacent TSP areas, regardless of their PTDF analysis impact on BPA's Network Paths.

934 ROR_{Fi} is the impact of roll-over rights for Firm Transmission Service contracts for BPA's
935 area. BPA assumes that all of its Transmission Service Agreements eligible to roll-over
936 in the future will be rolled over. Therefore the impact of the roll-over rights for
937 Transmission contracts in BPA's area is calculated based on the NITS_{Fi}, GF_{Fi} and PTP_{Fi}
938 obligations that are eligible for roll-over rights. For reservations that are eligible for
939 roll-over rights, BPA creates a reservation in the form of a Transmission Service
940 Number (TSN), with a Demand equal to the amount eligible to roll-over. BPA models
941 these reservations in its ETC Cases. For TSNs that were not modeled in the ETC Cases,
942 BPA derives the Network Path impacts of these reservations using PTDF analysis. If
943 BPA's customers choose not to exercise their roll-over rights by the required deadline,
944 BPA no longer holds out capacity for roll-over rights for that customer.

945 ROR_{Fi} also includes roll-over rights for Firm Transmission Service contracts for all of
946 BPA's adjacent TSPs. BPA assumes that all Long-Term Reservations for all of BPA's
947 adjacent TSP areas will be rolled over.

948 GF_{Fi} is the impact of grandfathered firm obligations expected to be scheduled or
949 expected to flow for BPA's area.

950 GF_{Fi} also includes the impact of grandfathered firm obligations expected to be
951 scheduled or expected to flow for all of BPA's adjacent TSP areas.

952 OS_{Fi} is the impact of other firm services.

953 BPA has no other firm services beyond those specified above. Therefore BPA sets OS_{Fi}
954 at zero for all of its Network Paths for all time periods.

955 BPA does not have coordination Agreements with other TSPs.

956 As a result, BPA calculates ETC_{Fi} for all of its Network Paths for all time periods as follows:

957
$$\mathbf{ETC}_{Fi} = \mathbf{NITS}_{Fi} + \mathbf{PTP}_{Fi} + \mathbf{GF}_{Fi} + \mathbf{ROR}_{Fi}$$

958 When using reservations, BPA further divides the ETC_{Fi} described previously into two
959 components: the base ETC_{Fi} values determined using the ETC Cases, and interim ETC_{Fi}
960 impacts determined using PTFDF analysis. These components are added together to calculate
961 a final ETC_{Fi} .

962 As described in "PTDF Analysis and *De Minimis*" on p.32, *de minimis* MW amounts of
963 reservations that were not modeled in the ETC Cases are not accounted for when calculating
964 ETC_{Fi} using reservations. However, all schedules are accounted for in ETC_{Fi} regardless of their
965 PTFDF analysis impact on BPA's Network Paths when calculating ETC_{Fi} using schedules.

966 While BPA includes all of the components described above in ETC_{Fi} , BPA accounts for $NITS_{Fi}$,
967 GF_{Fi} , PTP_{Fi} and ROR_{Fi} in its Network Path ATC calculations using different variables. For
968 descriptions of the variables used see p. 35.

969 Determining Base ETC_{Fi}

970 As indicated in "Use of the WECC Base Cases to determine ETC" beginning on p.30, BPA
971 creates heavy load ETC Cases for the months of January, May, and August and light load ETC
972 cases for the month of January as representative seasons to calculate base ETC_{Fi} values.
973 BPA's ETC Cases are produced using a power flow model that computes how much power will
974 flow over each Network Path for the assumed Load and generation levels for each season.
975 Counterflows are inherently modeled in these base cases.

976 In ETC Cases, BPA models all of its own $NITS_{Fi}$, GF_{Fi} and PTP_{Fi} Long-Term Reservations, as well as
977 those of its adjacent TSPs, active at the time the ETC Cases are produced.

978 To model the impact of PTP_{Fi} long-term reservations for all of its adjacent TSPs, BPA queries a
979 list of PTP_{Fi} long-term reservations from the OASIS of its adjacent TSPs. To model the impact
980 of GF_{Fi} and $NITS_{Fi}$ long-term obligations for all of BPA's adjacent TSPs, BPA contacts its
981 adjacent TSPs and requests a list of their GF_{Fi} obligations and a list of their $NITS_{Fi}$ with a list
982 of designated network resources with the MW amounts designated to serve Network Service
983 and Native Load.

984 BPA models the $NITS_{Fi}$, GF_{Fi} and PTP_{Fi} Long-Term obligations of all of its adjacent TSPs to the
985 extent that there are sufficient firm Transmission rights on BPA's or its adjacent TSPs'
986 Transmission Systems to serve the Load.

987 BPA uses the following assumptions to create ETC Cases for its ETC_{Fi} calculations:

988 **System topology:** Normal operating conditions are used.

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

- 992 • **$NITS_{Fi}$:** BPA assumes a 1-in-2 year seasonal heavy or light Load forecast, depending
993 on the Network Path being studied.
- 994 • **PTP_{Fi} and GF_{Fi} :** For the PTP_{Fi} and GF_{Fi} Long-Term Reservations modeled in the ETC
995 Cases, BPA assumes the lesser of the 1-in-2 year non-coincidental seasonal peak
996 Load forecast or firm rights to deliver power to the Load.

997 **Generation:** BPA does not use the generation assumptions contained in the WECC
998 base cases. Instead, BPA uses the following generation assumptions:

999 **FCRPS:** For the FCRPS resources serving $NITS_{Fi}$, PTP_{Fi} , and GF_{Fi} Long-Term
1000 Reservations, generation levels are set using a multiple-step process. For all
1001 seasons, BPA uses the following process:

1002 • The Columbia Generating Station is assumed to be on-line at full Load in the
1003 ETC cases. Generation levels at the Libby, Hungry Horse, Dworshak, and Albeni
1004 Falls projects are set based on the requirements set forth in the 2000 Biological
1005 Opinion. In addition, the generation levels at the Willamette Valley projects⁵
1006 are set at the minimum levels seen by season during Calendar Year
1007 2001. **Nameplate Adjusted Method:** When creating heavy load ETC Cases,
1008 generation levels for all other federal hydro projects⁶ are set by first
1009 determining the nameplate for each project and then adjusting such
1010 nameplates by outages forecasted for the particular plants. Next in the month
1011 of August, the Lower Snake plants (Lower Granite, Lower Monumental, Little
1012 Goose, and Ice Harbor) are capped at the observed project outflow over the
1013 past ten Augusts. Then multiple generation scenarios are modelled by stressing
1014 one of three different “zones” of Federal hydro resources to the nameplate
1015 adjusted generation levels described above and scales the generation at the
1016 remaining Federal hydro projects to match the sum of the demands for all
1017 contracts that call out non-specific Federal hydroelectric projects as PORs
1018 after adjusting these demands for the portion served by Columbia Generating
1019 Station, Libby, Hungry Horse, Dworshak, Albeni Falls, and the Willamette
1020 Valley projects. The Federal PTP demands at each project are then added to
1021 this result to obtain the final assumed generation level for each Federal hydro
1022 project. This overall method for modeling the federal resources is referred to
1023 as the “Nameplate Adjusted Method.”

1024 **Non-Federal Thermal Generators:** Non-federal thermal generators associated with
1025 PTP_{Fi} , GF_{Fi} and $NITS_{Fi}$ Transmission Service for BPA’s area and all adjacent TSP areas
1026 are set at up to the contract Demand.

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.

⁶ Willamette Valley projects include: Big Cliff, Cougar, Detroit, Dexter, Foster, Green Peter, Hills Creek, Lookout Point, Lost Creek.

- 1027 **Wind Generators:**
- 1028 • **PTP_{Fi}:** Wind generators associated with PTP_{Fi} Long-Term Reservations are set
- 1029 at the greater of the following:
- 1030 ○ Modeled on at 100 percent of the contract demand for the wind
- 1031 generator; or
- 1032 ○ Modeled off and replaced by the “Balancing Logic Method”.
- 1033 • **NITS_{Fi}:** The Network Path impacts of wind generators identified as designated
- 1034 network resources in NITS_{Fi} contracts or in the NT Resources Memorandum of
- 1035 Agreement in BPA’s area are determined on a Network Path-by-Network Path
- 1036 basis and set at the greater of the following:
- 1037 ○ The wind generators modeled on at the designated amount of the wind
- 1038 generators; or,
- 1039 ○ The wind generators modeled off and replaced by increasing the FCRPS
- 1040 generation level by the designated amount of the wind generators using
- 1041 the “Nameplate Adjusted Method” for all seasons described above.
- 1042 Wind generators designated as network resources in NITS_{Fi} contracts for all
- 1043 adjacent TSPs are modeled up to the designated amount.
- 1044 • **GF_{Fi}:** BPA and all of BPA’s adjacent TSPs have no GF_{Fi} contracts for wind
- 1045 generators.
- 1046 **Behind the Meter Generators:** Non-federal resources that do not require
- 1047 Transmission Service over the FCRTS and that are behind the meter are set up to
- 1048 levels used in BPA’s process for power system planning studies.
- 1049 **Mid-Columbia Hydro Projects:** Generation levels at the non-federal Mid-Columbia
- 1050 hydro projects are set up to 90 percent of their historical output by season.

1051 When creating heavy load ETC Cases, if there is more generation than load plus

1052 committed exports in the base case, BPA reduces all excess generation prorata, except for

1053 the stressed FCRPS zone see below, using the “Balancing Logic Method” for all seasons;

1054 the exports modeled on the COI and Pacific DC Intertie in the base case are reduced to

1055 match BPA’s obligation for firm export. The generation reduction is done to bring

1056 generation and load into balance in order to solve the power flow model.

1057 When creating light load ETC Cases, if there is more generation than Load in the base

1058 case, BPA reduces excess generation using a merit order sequence of tiered generation

1059 groups that are assumed to be re-dispatched based on age, heat rate, and past operation.

1060 Sensitivity Studies

1061 In calculating its base ETC_{Fi} values, BPA runs ETC Case Scenarios for three different

1062 sensitivities: the Canadian Entitlement Return (CER) obligation modeled on or off, wind

1063 resources designated to serve PTP_{Fi} and NITS_{Fi} on or off, and stressing the three different

1064 zones of the FCRPS.

1065 For the FCRPS scenarios, the three “zones” that are stressed individually in the scenarios

1066 are made up of the following projects: (i) Upper Columbia zone includes Grand Coulee

1067 and Chief Joseph; (ii) Lower Snake zone includes Lower Monumental, Lower Granite, Little

1068 Goose, and Ice Harbor; and (iii) Lower Columbia zone includes McNary, John Day, The

1069 Dalles and Bonneville.

1070 For the CER Scenarios, BPA models the FCRPS generators delivering or not delivering
1071 energy to Canada in the amount specified in the Canadian Entitlement Agreement.

1072 In the case where BPA models the FCRPS generators delivering energy to Canada, exports
1073 to Canada for the CER and the FCRPS generation level using the "Nameplate Adjusted
1074 Method" for all seasons (see above) is increased by the amount specified in the Canadian
1075 Entitlement Agreement.

1076 In the case where BPA models the FCRPS generators not delivering energy to Canada,
1077 exports to Canada for the CER and the FCRPS generation levels using the "Nameplate
1078 Adjusted Method" for all representative seasons is reduced by the MW amount specified in
1079 the Canadian Entitlement Agreement.

1080 For the wind resource Scenarios, see above for a description of the base ETC_{Fi} assumptions
1081 for wind generators serving PTP_{Fi} and $NITS_{Fi}$.

1082 Therefore, in its base ETC_{Fi} sensitivity analysis, BPA models the following

1083 6 Scenarios:

- 1084 1. Wind modeled off/Upper Columbia stressed
- 1085 2. Wind modeled off/Lower Snake stressed
- 1086 3. Wind modeled off/Lower Columbia stressed
- 1087 4. Wind modeled on/Upper Columbia stressed
- 1088 5. Wind modeled on/Lower Snake stressed
- 1089 6. Wind modeled on/Lower Columbia stressed

1090 All scenarios are run for (i) Spring, Late Summer with CER modeled off and (ii) Winter with
1091 CER modeled on for the last 3 scenarios; for a total of 15 scenarios.

1092 On a Network Path-by-Network Path basis, BPA uses the lowest seasonal base ETC_{Fi} value
1093 calculated from these 15 Scenarios in its Network Path ATC calculations as the ETC value.
1094 And BPA takes the difference between the highest seasonal base ETC_{Fi} value and the
1095 lowest ETC_{Fi} value from the 15 scenarios as the TRM value.

1096 Since base ETC_{Fi} values are only produced for the representative months mentioned
1097 above, BPA derives a 12-month profile of base ETC_{Fi} values using weighted averages. The
1098 following table shows these weighted averages by month for heavy load ETC Cases.

1099
1100

Table 3
Weighted Average Base ETC_{Fi} Values

Month	Percentage Used	Base ETC Values Used
January	100	January
February	100	January
March	50 50	January May
April	100	May
May	100	May

Month	Percentage Used	Base ETC Values Used
June	100	May
July	100	August
August	100	August
September	75 25	August January
October	50 50	August January
November	100	January
December	100	January

1101 For light load ETC Cases, the January ETC Case is used for all 12 months of the year.

1102 **Determining Interim ETC_{Fi} Using PTDF Analysis**

1103 To calculate the impacts for all NITS_{Fi} and PTP_{Fi} reservations for BPA’s area and all of
1104 BPA’s adjacent TSP areas that were not modeled in the ETC Cases, BPA uses PTDF analysis
1105 on all of the Demand reserved (see “PTDF Analysis and *De Minimis*” on p.32). PTDFs are
1106 assigned and mapped to individual bus points in the WECC base cases (refer to
1107 “Source/Sink and POR/POD Identification and Mapping” beginning on p. 30). The sum of
1108 these impacts is referred to as the interim ETC_{Fi} value, and is added to the base ETC_{Fi}
1109 value to produce a final ETC_{Fi} value for each time period for each Network Path.

1110 **Calculating Firm Available Transfer Capability (ATC_F)**

1111 When calculating ATC_F for its Network Paths for all time periods, BPA uses the following
1112 algorithm. (MOD-029 R7)

1113
$$ATC_F = TTC - ETC_{Fi} - CBM_i - TRM_i + Postbacks_{Fi} + Counterflows_{Fi}$$

1114 **Where:**

1115 ATC_F is the firm Available Transfer Capability for the Network Path for a specific time
1116 period.

1117 TTC is the Total Transfer Capability of the Network Path for that time period.

1118 See “Establishing Total Transfer Capability” on p. 28 for a discussion of how BPA
1119 establishes TTCs.

1120 ETC_{Fi} is the sum of impacts of existing firm commitments for the Network Path during
1121 that period.

1122 In BPA’s calculations, ETC_{Fi} is expressed as follows:

1123
$$ETC_{Fi} = LRES + SRES - SADJ/ETC \text{ Adjustments} + LETC$$

1124 **Where:**

1125 **LRES** is the sum of the positive impacts of PTP_{Fi} , GF_{Fi} , ROR_{Fi} and $NITS_{Fi}$ Long-Term
1126 Reservations for BPA’s area, plus the sum of the positive impacts of PTP_{Fi} , GF_{Fi} , ROR_{Fi}
1127 and $NITS_{Fi}$ Long-Term Reservations for all of BPA’s adjacent TSP areas, filtered to
1128 reduce or eliminate duplicate impacts from transactions that were already included in
1129 the ETC Case or that impact another Transmission Service’s Providers share of
1130 Transfer Capability.

1131 **SRES** is the sum of the positive impacts of PTP_{Fi} Short-Term Reservations for BPA’s
1132 area, plus the sum of the positive impacts of PTP_{Fi} Short-Term Reservations for all of
1133 BPA’s adjacent TSP areas, filtered to reduce or eliminate duplicate impacts from
1134 transactions that were already included in the ETC Case or that impact another
1135 Transmission Service’s Providers share of Transfer Capability.

1136 **SADJ/ETC Adjustments** is the variable used to make adjustments to ETC_{Fi} not
1137 captured in LRES or SRES. One such adjustment is applied to allow BPA to conduct
1138 deferral competitions, as required in Section 17.7 of BPA’s OATT. When a deferral
1139 reservation is confirmed, BPA applies an ETC adjustment to hold out Transfer
1140 Capability for the time period deferred, starting at the latter of five months out or the
1141 service commencement date of the original reservation, to allow for a competition.
1142 At four months out, if no competition is identified, the ETC adjustment is modified to
1143 add back Transfer Capability for the fourth month out.

1144 BPA uses SADJ adjustments to include a commercial uncertainty margin, which is the
1145 difference between the highest ETC_{Fi} value and lowest ETC_{Fi} value from all seasonal
1146 scenarios. At four months out, the adjustment is modified to add non-firm capability
1147 for the fourth month out. Additionally, BPA uses SADJ adjustments to represent the
1148 CER Off/On scenarios for the Cross Cascades North, Cross Cascades South, and North
1149 of Echo Lake flowgates. This is a PTDF adjustment that will apply to the months March
1150 through October (applied to the May, and August Base Case values to account for
1151 ETC_{Fi} .

1152 BPA also uses SADJ/ETC adjustments to ensure accurate accounting of ETC_{Fi} . These
1153 adjustments may be performed to account for situations such as data modeling
1154 corrections, and will be noted in the descriptions of the adjustments. **LETC** is the
1155 variable used to ensure that the amount of PTP_{Fi} and GF_{Fi} capacity BPA sets aside in
1156 the LRES variable does not exceed the total PTP_{Fi} and GF_{Fi} capacity specified in the
1157 contracts. Since BPA has PTP and GF contracts that give customers the right to
1158 schedule the capacity reserved between multiple PORs and PODs, this adjustment is
1159 necessary to ensure that ETC_{Fi} is not inflated.

1160 LETC is also used to adjust the LRES variable to match the base ETC values BPA
1161 calculates when BPA develops its ETC Cases. This adjustment is derived by comparing
1162 two values: a) the impacts of the confirmed PTP_{Fi} , GF_{Fi} and $NITS_{Fi}$ Long-Term
1163 Reservations derived from the ETC Cases and b) the impacts of the same reservations
1164 calculated using PTDF Analysis for each Network Path. The adjustment for each
1165 Network Path is equal to the difference of these two values. Conditional firm
1166 reservations are not included in the ETC Cases and therefore are also not included in
1167 this comparison.

1168 As described in "PTDF Analysis and *De Minimis*" on p. 30, *de minimis* MW amounts of
 1169 reservations that were not included in the ETC Cases are not accounted for when
 1170 calculating ETC_{Fi} using reservations.

1171 The following diagram illustrates how the variables used in BPA's ETC_{Fi} calculation
 1172 correspond to the variables contained in the ETC_{Fi} algorithm shown in "Calculating Firm
 1173 Existing Transmission Commitments" beginning on p. 32.

$ETC_{Fi} =$	$NITS_{Fi}$	+	GF_{Fi}	+	PTP_{Fi}	+	ROR_{Fi}
	↓		↓		↓		↓
	LRES		LRES		LRES		LRES
	+				+		
	SRES				SRES		
	+		+		+		+
	LETC		LETC		LETC		LETC
	-		-		-		-
	SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments

1174 CBM_i is the impact of the Capacity Benefit Margin on the Network Path during that period.

1175 BPA does not maintain CBM. Therefore BPA sets CBM at zero for all of its Network Paths
 1176 for all time periods.

1177 TRM_i is the impact of the Transmission Reliability Margin on that Network Path during that
 1178 period.

1179 BPA does not maintain TRM on its Network Paths. Therefore BPA sets TRM at zero for all
 1180 of its Network Paths for all time periods.

1181 $Postbacks_{Fi}$ are changes to ATC_F due to a change in the use of Transmission Service for that
 1182 period.

1183 Because BPA automatically recalculates ETC_{Fi} whenever there is a reduction in LRES or
 1184 SRES, BPA does not use $Postbacks_{Fi}$ for calculating ATC_F on any of its Network Paths.
 1185 Therefore BPA sets $Postbacks_{Fi}$ at zero for all of its Network Paths for all time periods.

1186 $Counterflows_{Fi}$ are adjustments to ATC_F

1187 BPA does not include confirmed Transmission reservations, expected interchange or
 1188 internal flow counter to the direction of the Network Path over and above the
 1189 counterflow that is assumed in the ETC Cases. BPA's rationale is that it does not want
 1190 to offer additional firm Transfer Capability due to counterflow that may not be
 1191 scheduled, as it could lead to Curtailments of Firm Transmission Service in Real-time.
 1192 (MOD-001 R3.2) Therefore BPA sets the $Counterflows_{Fi}$ component at zero for all of its
 1193 Network Paths for all time periods.

1194 As a result, BPA calculates ATC_F for its Network Paths for all time periods as follows:

1195
$$ATC_F = TTC - ETC_{Fi}$$

1196 As described in “Determining Base ETC_{Fi} ” on p. 32, counterflows are modeled in the ETC
1197 Cases. In some seasons, the amount of counterflows on particular Network Paths results in a
1198 negative ETC_{Fi} value, which, when subtracted from TTC, results in ATC_F greater than TTC.

1199 Calculating Non-Firm Transmission Service

1200 BPA sells six non-firm Transmission products. These products are:

- 1201 1. $NITS_{NF6i}$. This is a non-firm Transmission product available only to Transmission
1202 Customers with NITS Agreements. It is the highest quality of Non-Firm
1203 Transmission Service in that it is the last Non-Firm Transmission Service that would
1204 be Curtailed, if necessary.
- 1205 2. PTP_{NF5i} . This is a non-firm Transmission product available only to Transmission
1206 Customers with PTP Agreements. PTP_{NF5i} is the fifth Non-Firm Transmission Service
1207 that would be Curtailed, if necessary.
- 1208 3. PTP_{NF4i} . This is a non-firm Transmission product available only to Transmission
1209 Customers with PTP Agreements. PTP_{NF4i} is the fourth Non-Firm Transmission
1210 Service that would be Curtailed, if necessary.
- 1211 4. PTP_{NF3i} . This is a non-firm Transmission product available only to Transmission
1212 Customers with PTP Agreements. PTP_{NF3i} is the third Non-Firm Transmission
1213 Service that would be Curtailed, if necessary.
- 1214 5. PTP_{NF2i} . This is a non-firm Transmission product available only to Transmission
1215 Customers with PTP Agreements. PTP_{NF2i} is the second Non-Firm Transmission
1216 Service that would be Curtailed, if necessary.
- 1217 6. PTP_{NF1i} . This is a non-firm Transmission product available only to Transmission
1218 Customers with PTP Agreements. PTP_{NF1i} is the first Non-Firm Transmission Service
1219 that would be Curtailed, if necessary (i.e., this Transmission Service has the
1220 highest likelihood of being Curtailed).

1221 BPA calculates ETC_{NF_i} and ATC_{NF} for each of these products.

1222 Calculating Non-Firm Existing Transmission Commitments (ETC_{NF_i})

1223 When calculating ETC_{NF_i} for all time periods for a Network Path, BPA sums the positive
1224 impacts using PTDF analysis (see “PTDF Analysis and *De Minimis*” on p. 30 for further
1225 details). (MOD-029 R6)

1226
$$ETC_{NF_i} = PTP_{NF_i} + GF_{NF_i} + NITS_{NF_i} + OS_{NF_i}$$

1265 While BPA includes all of the components described above in ETC_{NF_i} , BPA accounts for
1266 PTP_{NF_i} and $NITS_{NF_i}$ in its Network Path ATC calculations using different variables. For a
1267 description of the variables used see p. 46.

1268 Calculating Non-Firm Available Transfer Capability (ATC_{NF})

1269 BPA uses different algorithms to calculate ATC_{NF} , ETC_{F_i} and ETC_{NF_i} for two time horizons
1270 for all of its Network Paths: Real-time and beyond Real-time. The Real-time horizon
1271 begins at 10 p.m. on the pre-schedule day for the 24 hours in the next day. The ETC_{F_i} and
1272 ETC_{NF_i} for the Real-Time horizon are calculated using schedules and reservations that have
1273 not yet been scheduled. The time horizon beyond Real-time includes hourly for the hours
1274 after those included in the Real-time period as well as daily and monthly calculations.
1275 The ETC_{F_i} and ETC_{NF_i} for the time horizon beyond Real-time is calculated using
1276 reservations.

1277 BPA calculates ETC_{NF_i} and ATC_{NF} for the six non-firm Transmission products (described
1278 beginning on p. 41) associated with NERC Curtailment priorities as follows:

- 1279 1. ATC_{NF6} : ATC_{NF6} is calculated for the $NITS_{NF6i}$ product. ETC_{NF_i} in this equation only
1280 includes $NITS_{NF6i}$.
- 1281 2. ATC_{NF5} : ATC_{NF5} is calculated for the PTP_{NF5i} product. ETC_{NF_i} in this equation
1282 includes $NITS_{NF6i}$ and PTP_{NF5i} .
- 1283 3. ATC_{NF4} : ATC_{NF4} is calculated for the PTP_{NF4i} product. ETC_{NF_i} in this equation
1284 includes $NITS_{NF6i}$, PTP_{NF5i} and PTP_{NF4i} .
- 1285 4. ATC_{NF3} : ATC_{NF3} is calculated for the PTP_{NF3i} product. ETC_{NF_i} in this equation
1286 includes $NITS_{NF6i}$, PTP_{NF5i} , PTP_{NF4i} , and PTP_{NF3i} .
- 1287 5. ATC_{NF2} : ATC_{NF2} is calculated for the PTP_{NF2i} product. ETC_{NF_i} in this equation
1288 includes $NITS_{NF6i}$, PTP_{NF5i} , PTP_{NF4i} , PTP_{NF3i} and PTP_{NF2i} .
- 1289 6. ATC_{NF1} : ATC_{NF1} is calculated for the PTP_{NF1i} product. ETC_{NF_i} in this equation
1290 includes $NITS_{NF6i}$, PTP_{NF5i} , PTP_{NF4i} , and PTP_{NF3i} , PTP_{NF2i} and PTP_{NF1i} .

1291 BPA calculates ETC_{NF_i} and ATC_{NF} for each of these products for each time period.

1292 When calculating ATC_{NF} for its Network Paths for the two time horizons described above,
1293 BPA uses the following algorithm. (MOD-029 R8)

$$1294 \quad \mathbf{ATC_{NF}} = \mathbf{TTC} - \mathbf{ETC_{F_i}} - \mathbf{ETC_{NF_i}} - \mathbf{CBM_{S_i}} - \mathbf{TRM_{U_i}} + \mathbf{Postbacks_{NF_i}} + \mathbf{Counterflow_{NF_i}}$$

1295 Where:

1296 ATC_{NF} is the non-firm Available Transfer Capability for the Network Path for that
1297 period.

1298 BPA calculates six ATC_{NF} values (as described above), one for each of the six non-
1299 firm Transmission products.

1300 TTC is the Total Transfer Capability of the Network Path for that period.
1301 See “Establishing Total Transfer Capability” on p. 28, for a description of how BPA
1302 establishes TTC.

1303 ETC_{Fi} is the sum of the impacts of existing firm Transmission commitments for the
1304 Network Path during that period.

1305 BPA uses different algorithms to calculate ETC_{Fi} for all of its Network Paths for the
1306 time horizon beyond Real-time and the Real-time horizon.

1307 ETC_{Fi} for the Time Horizon Beyond Real-Time

1308 For Network Path ATC_{NF} calculations for the time horizon beyond Real-time, ETC_{Fi} is
1309 expressed as follows:

$$1310 \quad ETC_{Fi} = LRES + SRES - SADJ/ETC \text{ Adjustments} + LETC$$

1311 Where:

1312 LRES is the sum of the positive impacts of PTP_{Fi} , GF_{Fi} , ROR_{Fi} and $NITS_{Fi}$ Long-Term
1313 Reservations for BPA’s area, plus the sum of the positive impacts of PTP_{Fi} , GF_{Fi} , ROR_{Fi}
1314 and $NITS_{Fi}$ Long-Term Reservations for all of BPA’s adjacent TSP areas, filtered to
1315 reduce or eliminate duplicate impacts from transactions that were already included in
1316 the ETC base case or that impact another Transmission Service’s Providers share of
1317 Transfer Capability.

1318 SRES is the sum of the positive impacts of PTP_{Fi} Short-Term Reservations for BPA’s
1319 area, plus the sum of the positive impacts of PTP_{Fi} Short-Term Reservations for all of
1320 BPA’s adjacent TSP areas, filtered to reduce or eliminate duplicate impacts from
1321 transactions that were already included in the ETC Case or that impact another
1322 Transmission Service’s Providers share of Transfer Capability.

1323 SADJ/ETC Adjustments is the variable used to make adjustments to ETC_{Fi} not
1324 captured in LRES or SRES. One such adjustment is applied to allow BPA to conduct
1325 deferral competitions, as required in Section 17.7 of BPA’s OATT. When a deferral
1326 reservation is confirmed, BPA applies an ETC adjustment to hold out Transfer
1327 Capability for the time period deferred, starting at the latter of five months out or the
1328 service commencement date of the original reservation, to allow for a competition.
1329 At four months out, if no competition is identified, the ETC adjustment is modified to
1330 add back Transfer Capability for the fourth month out.

1331 BPA uses SADJ adjustments to include a commercial uncertainty margin, which is the
1332 difference between the highest ETC_{Fi} value and lowest ETC_{Fi} value from all seasonal
1333 scenarios. At four months out, the adjustment is modified to add non-firm capability
1334 for the fourth month out. Additionally, BPA uses SADJ adjustments to represent the
1335 CER Off/On scenarios for the Cross Cascades North, Cross Cascades South, and North
1336 of Echo Lake flowgates. This is a PTDF adjustment that will apply to the months March
1337 through October (applied to the May, and August Base Case values to account for
1338 ETC_{Fi} .

1339 BPA also uses SADJ/ETC adjustments to ensure accurate accounting of ETC_{Fi}. These
 1340 adjustments may be performed to account for situations such as data modeling
 1341 corrections, and will be noted in the descriptions of the adjustments.

1342 LETC is the variable used to ensure that the amount of PTP_{Fi} and GF_{Fi} capacity BPA
 1343 sets aside in the LRES variable does not exceed the total PTP_{Fi} and GF_{Fi} capacity
 1344 specified in the contracts. Since BPA has PTP and GF contracts that give customers
 1345 the right to schedule the capacity reserved between multiple PORs and PODs, this
 1346 adjustment is necessary to ensure that ETC_{Fi} is not inflated.

1347 LETC is also used to adjust the LRES variable to match the base ETC values BPA
 1348 calculates when BPA develops its ETC Cases. This adjustment is derived by comparing
 1349 two values: a) the impacts of the PTP_{Fi}, GF_{Fi} and NITS_{Fi} Long-Term Reservations
 1350 derived from the ETC Cases and b) the impacts of the same reservations calculated
 1351 using PTDF Analysis for each Network Path. The adjustment for each Network Path is
 1352 equal to the difference of these two values. Conditional firm reservations are not
 1353 included in the ETC Cases and therefore are also not included in this comparison.

1354 As described in "PTDF Analysis and *De Minimis*" on p. 30, *de minimis* MW amounts of
 1355 reservations that were not included in the ETC Cases are not accounted for in ETC_{Fi}.

1356 The following diagram illustrates how the variables used in BPA's ETC_{Fi} calculation correspond
 1357 to the variables contained in the ETC_{Fi} algorithm shown in "Calculating Firm Existing
 1358 Transmission Commitments" beginning on p. 32.

ETC_{Fi} =	NITS_{Fi}	+	GF_{Fi}	+	PTP_{Fi}	+	ROR_{Fi}
	↓		↓		↓		↓
	LRES		LRES		LRES		LRES
	+				+		
	SRES				SRES		
	+		+				+
	LETC		LETC				LETC
	-		-		-		-
	SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments

1359 ETC_{Fi} for the Real-Time Horizon

1360 For Network Path ATC_{NF} calculations in the Real-time horizon, ETC_{Fi} is expressed as
 1361 follows:

1362
$$ETC_{Fi} = SCH_7^+ + ASC_7^+$$

1363 **Where:**

1364 SCH^+_7 is the sum of the positive impacts of schedules referenced to confirmed PTP_{Fi} ,
 1365 GF_{Fi} and $NITS_{Fi}$ reservations for BPA’s area, plus the sum of the positive impacts of
 1366 PTP_{Fi} , GF_{Fi} and $NITS_{Fi}$ schedules for all of BPA’s adjacent TSP areas.

1367 ASC^+_7 is the sum of the positive impacts of dynamic schedules that reference
 1368 confirmed PTP_{Fi} , GF_{Fi} and $NITS_{Fi}$ reservations for BPA’s area, plus the sum of the
 1369 positive impacts of dynamic PTP_{Fi} , GF_{Fi} and $NITS_{Fi}$ schedules for all of BPA’s adjacent
 1370 TSP areas.

1371 The following diagram illustrates how the variables used in BPA’s ETC_{Fi} calculation
 1372 correspond to the variables contained in the ETC_{Fi} algorithm shown in “Calculating
 1373 Firm Existing Transmission Commitments” beginning on p. 32. ROR_{Fi} is not included in
 1374 ETC_{Fi} for the Real-Time Horizon because ROR_{Fi} is not relevant for this time period.

$ETC_{Fi} =$	$NITS_{Fi}$	+	GF_{Fi}	+	PTP_{Fi}
	↓		↓		↓
	SCH^+_7		SCH^+_7		SCH^+_7
	+		+		+
	ASC^+_7		ASC^+_7		ASC^+_7

1375 ETC_{NFi} is the sum of the impacts of existing non-firm Transmission commitments for
 1376 the Network Path during that period.

1377 BPA uses different algorithms to calculate ETC_{NFi} for all of its Network Paths for the
 1378 time horizon beyond Real-time and the Real-time horizon.

1379 **ETC_{NFi} for the Time Horizon Beyond Real-time**

1380 For Network Path ATC_{NF} calculations in the time horizon beyond Real-time, ETC_{NFi}
 1381 is expressed as follows:

1382
$$ETC_{NFi} = RRES_{NF}$$

1383 **Where:**

1384 $RRES_{NF}$ is the sum of the positive impacts of all confirmed PTP_{NF5i} , PTP_{NF4i} , PTP_{NF3i} ,
 1385 PTP_{NF2i} , PTP_{NF1i} and $NITS_{NF6i}$ reservations for BPA’s area, plus the sum of the positive
 1386 impacts of all confirmed PTP_{NFi} and $NITS_{NFi}$ reservations for all of BPA’s adjacent TSP
 1387 areas.

1388 As described in “PTDF Analysis and *De Minimis*” on p. 30, *de minimis* MW amounts are not
 1389 accounted for in ETC_{NFi} when using reservations.

1390 The following diagram explains how the variables used in BPA’s ETC_{NFi} calculation correspond
 1391 to the variables contained in the ETC_{NFi} algorithm shown in “Calculating Non-Firm Existing
 1392 Transmission Commitments” beginning on p. 41.

ETC_{NFi} =	NITS_{NFi}	+	PTP_{NFi}
	↓		↓
	RRES _{NF}		RRES _{NF}

1393 ETC_{NFi} for the Real-time Horizon

1394 For Network Path ATC_{NF} calculations in the Real-time horizon, ETC_{NFi} is expressed as
1395 follows:

1396
$$\mathbf{ETC_{NFi} = SCH^{+}_{6,5,4,3,2,1} + ASC^{+}_{6,5,4,3,2,1}}$$

1397 Where:

1398 SCH⁺_{6,5,4,3,2,1} is the sum of the positive impacts of schedules referenced to confirmed
1399 PTP_{NFi2i}, PTP_{NFi1i} and NITS_{NFi6i} reservations for BPA’s area, plus the sum of the positive
1400 impacts of PTP_{NFi} and NITS_{NFi} schedules for all of BPA’s adjacent TSP areas.

1401 ASC⁺_{6,5,4,3,2,1} is the sum of positive impacts of dynamic schedules referenced to
1402 confirmed PTP_{NFi2i}, PTP_{NFi1i} and NITS_{NFi6i} reservations for BPA’s area, plus the sum of the
1403 positive impacts of dynamic PTP_{NFi}, GF_{NFi} and NITS_{NFi} schedules for all of BPA’s
1404 adjacent TSP areas.

1405 The following diagram illustrates how the variables used in BPA’s ETC_{NFi} calculation correspond
1406 to the variables contained in the ETC_{NFi} algorithm shown in “Calculating Non-Firm Existing
1407 Transmission Commitments” beginning on p. 41.

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

1408 CBM_{Si} is the impact of any schedules during that period using Capacity Benefit Margin.

1409 BPA does not maintain CBM. Therefore BPA sets CBM_{Si} at zero for all of its Network
1410 Paths for all time periods.

1411 TRM_{Ui} is the impact on the Network Path of the Transmission Reliability Margin for the
1412 Network Path that has not been released for sale (unreleased) as non-firm capacity
1413 during that period.

1414 BPA does not maintain TRM on its Network Paths. Therefore BPA sets TRM_{Ui} at zero
1415 for all of its Network Paths for all time periods.

1416 Postbacks_{NFi} are changes to non-firm Available Transfer Capability due to a change in
1417 the use of Transmission Service for that period.

1418 Because BPA automatically recalculates ETC_{Fi} and ETC_{NF_i} whenever there is a
1419 reduction in LRES, SRES, or RRES, BPA does not use $Postbacks_{NF_i}$ for calculating
1420 ATC_{NF} for any of its Network Paths in the time horizon beyond Real-time.

1421 BPA also does not use $Postbacks_{NF_i}$ for any of its Network Paths for the Real-time
1422 horizon.

1423 Therefore BPA sets $Postbacks_{NF_i}$ at zero for all of its Network Paths for the time
1424 horizon beyond Real-time and the Real-time horizon.

1425 **Counterflows_{NFi}** are adjustments to non-firm Available Transfer Capability.

1426 Counterflows resulting from firm and non-firm Transmission schedules, excluding
1427 dynamic schedules, are added back to ATC_{NF} in the **Counterflows_{NFi}** component.

1428 **Counterflows_{NFi}** is the sum of the negative impacts of schedules referenced to
1429 confirmed firm and non-firm reservations in BPA's area, plus the sum of the
1430 negative impacts of schedules for all of BPA's adjacent TSP areas. In BPA's
1431 calculations, **Counterflows_{NFi}** is expressed as $SCH_{7,6,5,4,3,2,1}^-$.

1432 As a result BPA calculates ATC_{NF} for its Network Paths for all time periods as follows:

1433
$$ATC_{NF} = TTC - ETC_{Fi} - ETC_{NF_i} + Counterflows_{NF_i}$$

1434 As described in "Determining Base ETC_{Fi} " on p. 32, counterflows are modeled in the ETC
1435 Cases used to determine ETC_{Fi} . In some cases, the amount of counterflows on particular
1436 Network Paths result in a negative ETC_{Fi} value, which, when subtracted from TTC, results
1437 in ATC_{NF} greater than TTC. In other cases, the amount of **Counterflows_{NFi}** exceeds the sum
1438 of the ETC_{Fi} and ETC_{NF_i} , which, when added to TTC, also results in ATC_{NF} greater than TTC.

1439 **Adjustments to Network Path ATC Values**

1440 There may be instances where BPA needs to perform testing in the production environment of
1441 the systems that manage BPA's ATC calculations. In these instances, BPA may adjust its ATC
1442 values across the network paths to ensure that Hourly requests are not declined due to lack of
1443 ATC across the network paths. BPA will issue a notice to customers with the details prior to
1444 performing this testing.

1445

1446 **IX. Data Sources and Recipients**

1447 BPA receives data for use in its ATC calculations, and provides data for use in calculating
1448 transfer and Flowgate capabilities through the WECC base case process described beginning
1449 on p. 2. BPA also directly receives and provides data, such as outage information and specific
1450 Transmission commitments, from and to the following Transmission Service Providers and
1451 Transmission Operators: (MOD-001 R3.3, R3.4)

- 1452
- Avista Corporation
 - BC Hydro
- 1453

- 1454 • California Independent System Operator
- 1455 • City of Tacoma, Department of Public Utilities, Light Division
- 1456 • Eugene Water and Electric Board
- 1457 • Fortis BC
- 1458 • Idaho Power Company
- 1459 • Los Angeles Department of Water and Power
- 1460 • NV Energy
- 1461 • NorthWestern Energy
- 1462 • Pacific Gas & Electric
- 1463 • PacifiCorp
- 1464 • Pend Oreille County Public Utility District No. 1
- 1465 • Portland General Electric
- 1466 • Public Utility District No. 1 of Chelan County
- 1467 • Public Utility District No. 1 of Clark County
- 1468 • Public Utility District No. 1 of Douglas County
- 1469 • Public Utility District No. 2 of Grant County, Washington
- 1470 • Public Utility District No. 1 of Snohomish County
- 1471 • Puget Sound Energy, Inc.
- 1472 • Sacramento Municipal Utility District
- 1473 • Seattle City Light
- 1474 • Southern California Edison
- 1475 • Transmission Agency of Northern California
- 1476 • Western Area Power Administration - Sierra Nevada Region
- 1477 • California Independent System Operator

1478 X. Responding to Data Requests

1479 Upon official request from any Transmission Service Provider, Planning Coordinator,
 1480 Reliability Coordinator, or Transmission Operator for any data from the list below, solely for
 1481 use in the requestor's ATC or AFC calculations, BPA will begin to make the data available
 1482 within 30 calendar days of receiving the request.

- 1483 • Expected generation and Transmission outages, additions, and retirements
- 1484 • Load forecasts
- 1485 • Unit commitments and order of dispatch, to include all designated resources (BPA does
 1486 not have resources that are committed or have the legal obligation to run)
- 1487 • Firm NITS and non-firm NITS (i.e. Secondary Service)
- 1488 • Firm and non-firm Transmission reservations
- 1489 • Grandfathered obligations
- 1490 • Firm roll-over rights
- 1491 • Any firm and non-firm adjustments applied by BPA to reflect parallel path impacts

- 1492 • Power flow models and underlying assumptions
- 1493 • Contingencies, provided in one or more of the following formats:
 - 1494 ○ A list of Elements
 - 1495 ○ A list of Network Paths
 - 1496 ○ A set of selection criteria that can be applied to the WECC base cases used by
 - 1497 BPA
- 1498 • Facility Ratings
- 1499 • Any other service that impact ETCs
- 1500 • Values of CBM and TRM for all ATC Paths
- 1501 • Values of TTC and ATC for all ATC Paths
- 1502 • Source and sink identification and mapping to the WECC base cases

1503 BPA will make this data available on the schedule specified by the requestor (but no more
 1504 frequently than once per hour, unless mutually agreed to by the requestor and Bonneville).

1505 For a Transmission Service Provider, Planning Coordinator, Reliability Coordinator, or
 1506 Transmission Operator to officially request data to use in ATC or AFC calculations, the
 1507 requestor must fill out the **Data Request Form** (MOD-001 R9) found on BPA's website
 1508 http://transmission.bpa.gov/business/atc_methodology/. The completed request form must
 1509 be sent to nercatcstandards@bpa.gov with **Data request Form** (MOD-001 R9) in the subject
 1510 line. (MOD-001 R9)

1511 XI. ATCID Revisions

1512 BPA will notify the entities contained in ATCID TP Distribution List when implementing a new
 1513 or revised ATCID and make its current ATCID available. (MOD-001 R4, R5)

1514 XII. Version History

ATCID Revision History			
Version	Date Revised	Description of Changes	Prepared by
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

ATCID Revision History

3.0	08/11/2011	<p>P. 7 line 114: Revised frequency of hourly calculations from at least three times per hour to at least once per hour.</p> <p>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> <p>P. 17 lines 395-397: Revised sentence to include Montana Intertie as an ATC Path that is limited by contract.</p> <p>P. 18 lines 440-445: Revised paragraph to include Montana Intertie as an ATC Path where another TOP sets the TTC.</p> <p>P. 19 line 483-486 and P. 40 line 1102: Added forecasted network resources to be included in Network Integration Transmission Service</p> <p>P. 20 line 517: corrected reference from ETC to ATC_{NF}.</p> <p>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> <p>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> <p>P. 29 line 789: Deleted "implemented" from which schedules impact counterflows.</p> <p>P. 30 lines 798-800: Added a note describing the variable RADJ/Congestion Management and how it impacts ATC calculations.</p> <p>P. 44: Corrected footnote 7 to align it with the reference.</p> <p>P. 47: Deleted language referring to including adjacent TSP reservations in interim ETC_{FI}.</p> <p>P. 53 lines 1517-1521: Added paragraph describing LETC that was mistakenly left out in Version 1.0 and 2.0.</p>	L Trolese
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ATCID Revision History			
		<p>P. 57 line 1604: Deleted “confirmed” from which schedules impact counterflows.</p> <p>P. 58: Replaced table delineating the NERC registered functions of the entities with a bulleted list of the entities.</p> <p>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.</p> <p>Appendix C: Updated the SOL Methodology.</p> <p>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.</p>	
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>P. 39 lines 1068-1070, P. 40 lines 1077-1079 and lines 1087-1089: Removed language referring to the month of August.</p> <p>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.</p>	L Trolese
6.0	11/1/2011	<p>P.31 Table 2 BPA Flowgates: Added the McNary – John Day #2 500 kV line to the West of McNary Flowgate definition.</p> <p>Appendix C: Updated the SOL Methodology.</p>	L Beckman
7.0	11/10/2011	P. 40 line 1103 and P.41 line 1118: Changed effective date from November 8 th 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>P. 5, P. 22, P. 29: Defined BPA’s TRM practice for the Northern Intertie S>N Path.</p> <p>P. 20 line 528 and P. 23 line 597: Replaced NI Holdout in the ATC_F formula with TRM.</p>	L Beckman

ATCID Revision History			
10.0	02/14/2012	<p>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.</p>	L Beckman
11.0	02/22/2012	<p>P. 8 line 166: Removed reference to Northwest Power Pool (NWPP) Outage Coordination Processes, dated 01/29/09.</p>	L Beckman
12.0	03/01/2012	<p>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.</p>	L Beckman
13.0	03/27/2012	<p>P. 31 Table 2 BPA Flowgates: Removed the Anderson Canyon-Beverly Park 115 kV line from the Cross Cascades North Flowgate Transmission Line Components. P. 4 line 52: Moved MOD 008-01 to the Methodologies Selected section.</p>	L Beckman
14.0	04/11/2012	<p>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.</p>	L Beckman
15.0	05/15/2012	<p>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>	L Beckman L Trolese

ATCID Revision History			
		<p>P. 42 lines 1157-1159 and P. 51 lines 1433-1436: Added description of how BPA accounts for schedules in ETC_{FI}.</p> <p>P. 44-45: Removed the definition of and all reference to the "94th Percentile Method".</p> <p>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.</p>	
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>P. 31 Table 2 BPA Flowgates: Added outage conditions flowgate definition for Raver-Paul (N>S).</p> <p>P. 29-30 lines 774,787,799: Replaced RADJ variable descriptions with RADJ/ETC.</p>	L Beckman
18.0	09/20/2012	<p>P. 12 line 299 Table 1 BPA Paths: Removed Transmission Line Components and RAS.</p> <p>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> <p>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.</p> <p>Appendix C: Updated the SOL Methodology.</p>	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
20.0	10/24/2012	<p>P. 32 Table 2 BPA Flowgates: Added the South of Boundary Flowgate and Transmission Line Components.</p> <p>P. 33 Figure 3 BPA Network Flowgate Map: Added the South of Boundary Flowgate.</p>	L Beckman
21.0	11/14/2012	<p>P. 8, lines 159-167: Updated BPA's allocation processes for the Columbia Injection (N>S) and Wanapum Injection (N>S) flowgates.</p> <p>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> <p>P. 31-33 Table 2 BPA Flowgates: Added the North of Hanford (S>N), South of Allston (S>N), Columbia Injection</p>	L Beckman

ATCID Revision History			
		<p>(N>S), Wanapum Injection (N>S) and West of Lower Monumental (E>W) Flowgates in Transmission Line Components, effective Nov. 30, 2012.</p> <p>P. 45 and 46, lines 1245-1248, 1286-1288 and 1318: Added documentation describing ETC calculation practices for light load ETC Cases.</p> <p>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.</p>	
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>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> <p>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> <p>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> <p>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.</p>	L Wickizer
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>P.32 Table 2 BPA Flowgates: Updated flowgate names on OASIS.</p> <p>P. 41 lines 1102-1112: Added documentation for Mid-Columbia generators in the weighted PTFD description.</p>	L Wickizer

ATCID Revision History			
27.0	05/01/2013	<p>P. 38-39 lines 993-1002: Updated BPA's process for mapping and incorporating outages into the WECC base case.</p> <p>Appendix A: Updated Avista's West of Hatwai Ownership Agreement number.</p>	L Wickizer
28.0	05/15/2014	<p>P. 7-8 lines 123-127, 131-134, 142-143, 149-150: Language clarification in Limiting Assumptions section.</p> <p>P. 9 lines 178-203: Updated BPA's process for outage planning.</p> <p>P. 10 lines 209 - 222: Language clarification on Daily and Hourly TTC and TFC Calculations.</p> <p>P. 10-11 lines 238 - 272: Language clarification on SOL Priorities Used to Set TTC and TFC.</p> <p>P. 37, lines 884-885, 892: Language clarification on SOL study process.</p> <p>P. 38, lines 952-953: Language clarification on SOL study process.</p> <p>P. 39, line 965: Language clarification on TFC calculation.</p> <p>Appendix C: Updated the SOL Methodology.</p>	M Olczak
29.0	05/31/2014	<p>P. 33 Table 2 BPA Flowgates: Added outage conditions flowgate definition for West of McNary.</p>	M Olczak
30.0	7/24/2014	<p>P. 32 Table 2 BPA Flowgates: Changed Olympia - South Tacoma 230kV to St. Clair - South Tacoma 230kV in the Raver-Paul section.</p> <p>P. 36 Table 3 Interfaces with BAs Adjacent to BPA: Added Gridforce Energy Management as a BA-BA interconnection.</p> <p>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> <p>P. 5 Clarification on number of BAs within the WECC area</p>	J Ofstead
31.0	09/13/2014	<p>P. 33 Table 2 BPA Flowgates: Updated West of McNary flowgate definition during outages.</p>	J Ofstead

ATCID Revision History			
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>P. 4, lines 32-38: Deleted lines regarding registration amongst other organizations other than NERC.</p> <p>P.5-6, lines 67-101: Deleted section on "BPA's Use of Western Electricity Coordinating Council Base Cases".</p> <p>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.oatiaoasis.com/bpat/index.html) (MOD-001 R3.6.1) (MOD-001 R3.6.2)"</p> <p>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> <p>P.16, lines 347-349: Deleted language to reflect current practices.</p> <p>P. 16, line 350: Added "...and phase shifters".</p> <p>P. 16, lines 352-359: Deleted language regarding phase shifters.</p> <p>P. 18, lines 362-363: Deleted language regarding BPA engineers running variations on WECC base cases.</p> <p>P.17, lines 371-373: Added language on base cases being updated with a Mid-Season update.</p> <p>P. 17, lines 388-389: Deleted reference to Table 1 for RAS.</p> <p>P. 17, line 391: Deleted language reference to BPA transmission lines with series compensation.</p> <p>P. 18, lines 401-404: Deleted language on modeling contingencies.</p> <p>P. 18, lines 416-417: Deleted language related to</p>	L. Proctor

ATCID Revision History

		<p>Montanan Intertie Path limitation by Colstrip Project and NorthWestern Energy is the TO and set TTC for this ATC Path.</p> <p>P. 18, lines 423-424: Deleted the reference to ATC paths for which BPA expresses TTC by nomogram.</p> <p>P. 18, lines 431-432: Deleted language related to the process defined by WECC's OTCP.</p> <p>P. 18, line 437: Deleted reference to LaGrande Path.</p> <p>P. 18, lines 438-442: Deleted language related to path ratings.</p> <p>P. 19 lines 460-484: Updated language on TTC ratings.</p> <p>P. 21, lines 538: Deleted reference to Appendix D, which has been deleted from this document.</p> <p>P.30, lines 820-822: Deleted reference to DSO 319.</p> <p>P.31, lines 851-852: Table 2, BPA Flowgates: Deleted facilities monitored during outage conditions for West of McNary.</p> <p>P. 35, lines 863-866: Deleted "History or Flowgates".</p> <p>P. 35, line 873 and line 87: Replaced "included as" with "protected for by".</p> <p>P. 36, lines 883-884: Deleted "Note" on multiple interfaces.</p> <p>P. 39-40, lines 1002, 1007 and 1008: Replaced "WECC" with "Peak".</p> <p>P. 40, lines 1032-1033: Updated language for accuracy.</p> <p>P. 40, lines 1037 and 1049: Replaced "calculated" with "published".</p> <p>P. 41, lines 1064: Added "...the PTDF difference is...".</p> <p>P. 44, lines 1164, 1175, 1190 and 1195: Deleted reference to BPA not having coordination agreements with other TSP.</p> <p>P.45, lines 1199: Added language to reflect BPA does not have coordination agreements with other TSPs.</p> <p>P. 45, line 1213: Deleted reference to Appendix D, which</p>	
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ATCID Revision History			
		<p>has been deleted.</p> <p>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.</p> <p>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.</p> <p>Appendix B: Deleted - Significant Equipment Operating Bulletin 19.</p> <p>Appendix D: Deleted BPA NITS, GF and PTP Agreements list from 2011.</p> <p>Appendix E: Deleted DSO 319</p>	
35.0	08/10/2015	<p>Language updated to reflect completion of the bulk MOD-030 Mitigation Plan.</p> <p>P. 3, lines 7-8: Deleted "or Available Flowgate Capability (AFC)"</p> <p>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> <p>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</p>	L. Proctor

ATCID Revision History

		<p>"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> <p>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> <p>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> <p>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> <p>P. 11: added "NV Energy" in line 243, and deleted "Sierra Pacific Power Company (SPPC) in line 254</p> <p>P. 12: line 284 deleted "MOD-029"</p> <p>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> <p>P. 26, 27 and 28: replaced "Flowgate" with "Network Path" in chart</p> <p>P. 28: replaced "Flowgate" with "Network Path" in lines 703 and 706; changed "Figure 1" to "Figure 2"; deleted lines 708-712</p> <p>P. 30: deleted lines 713-723 and chart</p> <p>P. 31: deleted lines 724-766</p> <p>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> <p>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</p>	
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ATCID Revision History

		<p>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> <p>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> <p>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> <p>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</p> <p>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> <p>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> <p>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> <p>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> <p>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> <p>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>	
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ATCID Revision History

		<p>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> <p>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> <p>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> <p>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</p> <p>P. 46: replaced "Flowgate" with "Network Path" in lines 1309 and 1330; deleted "as described in MOD-030 R7" in line 1311; added "(MOD-029 R6)" to line 1311; and deleted references to MODs in lines 1316, 1322, 1325, 1327, 1337 and 1343</p> <p>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> <p>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> <p>P. 49: replaced "Flowgate" with "Transfer" in lines 1418 and 1422; replaced "Flowgate" with "Network Path" in lines 1435 and 1436</p> <p>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> <p>P. 51: added "Network Path" to line 1481 and replaced</p>	
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ATCID Revision History			
		<p>"AFC" with "ATC"; and replaced "Flowgate" with "Network Path" in line 1497</p> <p>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> <p>P. 53-57: added lines 1339-1516</p> <p>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</p> <p>P. 59: replaced "Flowgates" with "Network Path" in line 1762; deleted "and Flowgates" in line 1766; and deleted line 1767</p>	
36.0	8/28/15	<p>Moved Appendix B: System Operating Limit Methodology for the Operations Horizon; Appendix 1 - TPL-001-0.1 System 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 as the ATCID at: http://www.bpa.gov/transmission/Doing%20Business/Pages/default.aspx under the ATC Methodology.</p>	L. Proctor
37.0	9/29/15	<p>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 Contract Number deleted "13ZZ-15826 (formerly" and added under Contract Description, Consent Agreement, Contract Party "Under consent agreement and EDF Trading North American LLC".</p>	L. Proctor
38.0	11/02/15	<p>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 Wautoma-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</p>	L. Proctor

ATCID Revision History			
		10TX-15107 from the COI path.	
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
40.0	1/03/16	<p>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> <p>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> <p>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> <p>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."</p>	L. Proctor
41.0	9/06/2016	<p>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>	L. Proctor

ATCID Revision History			
		<p>p. 16, line 430-431: Added "SADJ" and "reflect the TRM across this path that"; deleted lines 433-436</p> <p>p. 20, line 565: Added "SADJ", "reflect the TRM across this path that" and "and"; deleted lines 567-570</p> <p>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"</p>	
42.0	11/01/2016	<p>Table of Contents: Deleted section IX. BA to BA Interconnection Methodology per BPA decision to no longer utilize this methodology</p> <p>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> <p>p.34, lines 930-931: Deleted "and light load ETC Cases for the month of January"</p> <p>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> <p>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> <p>p. 37, line1020: Replaced "90th Percentile" with "Nameplate Adjusted" and "on p. 35" with "above</p> <p>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</p>	L. Proctor

ATCID Revision History			
		<p>“Prorata, except for the stress FCRPS zone, see below”; and replaced “90th Percentile” with “Balancing Logic”</p> <p>p. 38, lines 1039-1041: Deleted lines</p> <p>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> <p>p. 38, lines 1055-1056 and lines 1059-1060: Replaced “90th Percentile” with “Nameplate Adjusted”</p> <p>p. 38, lines 1062-1063: Deleted “NITSfi” and replaced “p. 39” with “above”</p> <p>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> <p>p. 41, Added lines 1135-1142</p> <p>p. 46, Added lines 1322-1329</p> <p>p. 49-53, lines 1376-1553: Deleted section IX. BA to BA Interconnection Methodology per BPA decision to no longer utilize this methodology.</p>	
43.0	11/14/2016	<p>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> <p>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> <p>p.34, lines 925-926: Added “and light load ETC Cases for the month of January”:</p>	L. Proctor

ATCID Revision History			
44.0	4/1/2017	<p>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.</p> <p>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.</p> <p>Appendix A: Removed.</p>	A. Heredia
45.0	9/19/2017	<p>p. 11, Added lines 335-336</p> <p>p. 12, line 339: Added "When modeling contingencies"</p> <p>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."</p>	L. Proctor
46.0	4/01/2018	<p>p. 4, line 111: Deleted "See Appendix A for a list of contracts and specified Paths with shared ownership."</p> <p>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</p>	L. Proctor

ATCID Revision History			
		<p>"seasonal" to "seasonal TTC". Line 332 deleted "always credible".</p> <p>p. 34, line 999: Removed "June".</p> <p>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> <p>p. 40, line 1179: Deleted "June".</p> <p>p. 46, line 1366: Deleted "June".</p>	
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>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> <p>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.</p> <p>BPA is discontinuing the use of RETC in BPA's ETC calculation. References to the RETC variable have been removed from the document.</p>	M. Olczak

ATCID Revision History			
51.0	09/10/2019	<p>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> <p>p.30, line 802 – specifies that BPA updates its Hourly PTDFs at least once per day for hourly ETC calculations</p> <p>p.30, line 808 – clarifies that BPA uses Daily PTDFs published for hour ending 11 of each day in its Daily ETC calculations</p> <p>p.30, lines 812 – 814 and 816 – 819 – clarifies which generation and transmission outages are included in BPA's daily and monthly ETC calculations</p>	

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