

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**

Effective Date: October 21, 2020

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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 dams¹
15 on the Columbia and Snake Rivers, and the Columbia Generating Station nuclear plant.
16 Each entity is separately managed and financed, but the facilities are operated as an
17 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
- 25 • **Short-Term Reservation:** a confirmed reservation that has duration less than 365
26 days

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

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

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

27 III. Overview

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

31 Methodologies Selected

32 MOD-029-2a

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

36 MOD-008-1

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

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 flow-based ATC Paths: South of Allston
111 S>N, 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 flow-based ATC
115 Path when all lines are in service. During outage conditions, individual allocations exist for
116 the loss of each transmission line in the flow-based ATC Path. BPA determines its share of
117 Existing 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 flow-based ATC Paths that are derived
161 using nomograms, if the assumptions are re-evaluated just prior to the pre-schedule
162 day to incorporate updated data inputs, the TTC may be updated. The pre-schedule
163 forecast 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 flow-based ATC 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 flow-based ATC Paths that are derived
208 using nomograms, if the assumptions are re-evaluated just prior to the pre-schedule
209 day to incorporate updated data inputs, the TTC may be updated. The pre-schedule
210 forecast 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 flow-based ATC 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 for 1:1 ATC Paths

236 This section describes in detail how BPA implements the Rated System Path methodology for
237 the 1:1 ATC Paths listed in Table 1. It addresses all of the Requirements in Standard MOD-
238 029-2a.

239 BPA’s 1:1 ATC Paths

240 The following table shows the 1:1 ATC Paths for which BPA uses the Rated System Path
241 methodology.

242 **Table 1**

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

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

243

244

245

BPA will select Rated System Path Methodology if new 1:1 ATC Paths are identified and implemented. Table 1 will be updated to reflect the new 1:1 ATC Paths. (MOD-001 R1)

246 **Calculating Total Transfer Capability (TTC)**

247 **Data and Assumptions**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

322 **Process to Determine TTC**

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

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

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

330 When modeling contingencies for stability limited paths, refer to the current version of
331 “RC West System Operating Limits Methodology for the Operations Horizon” (RC West SOL
332 Methodology) posted on RC West’s website <https://rc.aiso.com> for a detailed description
333 of how BPA determines SOLs used to set TTCs. (MOD-029 R2.1.2)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

392 As described in Section III, "Overview," information regarding TTCs is shared electronically
393 between the appropriate BPA organizations within seven calendar days of the finalization of
394 the study report for the TTCs. BPA sends a notice to all TSPs for the ATC Paths listed in Table
395 1 where there are multiple TSPs *prior* to limitations in TTCs. (MOD-029 R4)

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

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

402 An ATC Path for which BPA does not perform studies to determine the most current value of
403 TTC is Reno - Alturas NW Sierra (RATS). For RATS, NV Energy determines TTC. The TTC
404 Ratings are provided to BPA and BPA then sends a Notice of Planned Path Limitation. (MOD-
405 029 R3)

406 Calculating Firm Transmission Service for 1:1 ATC Paths

407 Calculating Firm Existing Transmission Commitments (ETC_F)

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

$$410 \quad \text{ETC}_F = \text{NL}_F + \text{NITS}_F + \text{GF}_F + \text{PTP}_F + \text{ROR}_F + \text{OS}_F$$

411 **Where:**

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

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

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

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

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

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

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

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

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

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

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

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

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

455
$$ETC_F = NITS_F + GF_F + PTP_F + ROR_F$$

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

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

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

462
$$ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + Counterflows_F$$

463 **Where:**

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

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

466 See “Process to Determine TTC ” beginning on p. 11, for a description of how BPA
467 determines TTC .

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

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

471
$$ETC_F = LRES + SRES + LETC - SADJ/ETC \text{ Adjustments}$$

472 **Where:**

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

474 **SRES** is the sum of the PTP_F Short-Term Reservations.

475 **LETC** is used to ensure that the amount of PTP_F capacity BPA sets aside in the **LRES**
 476 variable for contracts where BPA gives customers the right to schedule the
 477 capacity reserved between multiple PORs and PODs does not exceed the total PTP_F
 478 capacity specified in those contracts.

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

481 BPA applies one such adjustment to allow for deferral competitions, as required in
 482 Section 17.7 of BPA’s OATT. When a deferral reservation is confirmed, BPA applies
 483 an ETC adjustment to hold out transfer capability for the time period deferred,
 484 starting at the latter of five months out or the service commencement date of the
 485 original reservation, to allow for a competition. At four months out, if no
 486 competition is identified, the ETC adjustment is modified to post back transfer
 487 capability for the fourth month out.

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

491 The following diagram illustrates how the variables used in BPA’s ETC_F calculations
 492 correspond to the variables contained in the ETC_F algorithm shown in “Calculating
 493 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

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

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

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

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

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

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

505 **Counterflows_F** are adjustments to ATC_F .

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

513 **Calculating Non-Firm Transmission Service for 1:1 ATC Paths**

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

- 515 1. **NITS_{NF6}**. This is a non-firm Transmission product available only to Transmission
516 Customers with NITS Agreements. It is the highest quality of Non-Firm Transmission
517 Service in that it is the last Non-Firm Transmission Service that would be Curtailed, if
518 necessary.
- 519 2. **PTP_{NF5}**. This is a non-firm Transmission product available only to Transmission
520 Customers with PTP service Agreements. **PTP_{NF5}** is the fifth Non-Firm Transmission
521 Service that would be Curtailed, if necessary.
- 522 3. **PTP_{NF4}**. This is a non-firm Transmission product available only to Transmission
523 Customers with PTP service Agreements. **PTP_{NF4}** is the fourth Non-Firm Transmission
524 Service that would be Curtailed, if necessary.
- 525 4. **PTP_{NF3}**. This is a non-firm Transmission product available only to Transmission
526 Customers with PTP service Agreements. **PTP_{NF3}** is the third Non-Firm Transmission
527 Service that would be Curtailed, if necessary.
- 528 5. **PTP_{NF2}**. This is a non-firm Transmission product available only to Transmission
529 Customers with PTP service Agreements. **PTP_{NF2}** is the second Non-Firm Transmission
530 Service that would be Curtailed, if necessary.

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

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

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

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

$$539 \quad ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}$$

540 **Where:**

541 $NITS_{NF}$ is the non-firm capacity set aside for Network Integration Transmission Service
542 serving Load (i.e., secondary service), to include losses and Load growth not otherwise
543 included in TRM or CBM.

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

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

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

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

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

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

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

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

$$558 \quad ETC_{NF} = NITS_{NF} + PTP_{NF}$$

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

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

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

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

- 572 1. **ATC_{NF6}**: ATC_{NF6} is calculated for the NITS_{NF6} product. ETC_{NF} in this equation only
573 includes NITS_{NF6}.
- 574 2. **ATC_{NF5}**: ATC_{NF5} is calculated for the PTP_{NF5} product. ETC_{NF} in this equation includes
575 NITS_{NF6} and PTP_{NF5}.
- 576 3. **ATC_{NF4}**: ATC_{NF4} is calculated for the PTP_{NF4} product. ETC_{NF} in this equation includes
577 NITS_{NF6}, PTP_{NF5} and PTP_{NF4}.
- 578 4. **ATC_{NF3}**: ATC_{NF3} is calculated for the PTP_{NF3} product. ETC_{NF} in this equation includes
579 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, and PTP_{NF3}.
- 580 5. **ATC_{NF2}**: ATC_{NF2} is calculated for the PTP_{NF2} product. ETC_{NF} in this equation includes
581 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, PTP_{NF3} and PTP_{NF2}.
- 582 6. **ATC_{NF1}**: ATC_{NF1} is calculated for the PTP_{NF1} product. ETC_{NF} in this equation includes
583 NITS_{NF6}, PTP_{NF5}, PTP_{NF4}, PTP_{NF3}, PTP_{NF2} and PTP_{NF1}.

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

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

587
$$\mathbf{ATC_{NF}} = \mathbf{TTC} - \mathbf{ETC_F} - \mathbf{ETC_{NF}} - \mathbf{CBM_S} - \mathbf{TRM_U} + \mathbf{Postbacks_{NF}} + \mathbf{Counterflow_{NF}}$$

588 **Where:**

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

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

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

593 See “Calculating Total Transfer Capability” beginning on p. 13 for a description of BPA’s
594 process to determine TTC.

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

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

598 **ETC_F for the Time Horizon Beyond Real-Time**

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

602
$$\mathbf{ETC_F = LRES + SRES - SADJ/ETC\ Adjustments + LETC}$$

603 **Where:**

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

605 **SRES** is the sum of the PTP_F Short-Term Reservations.

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

608 BPA applies one such adjustment to allow for deferral competitions, as required in Section
609 17.7 of BPA's OATT. When a deferral reservation is confirmed, BPA applies an ETC
610 adjustment to hold out transfer capability for the time period deferred, starting at the latter
611 of five months out or the service commencement date of the original reservation, to allow for
612 a competition. At four months out, if no competition is identified, the ETC adjustment is
613 modified to add back transfer capability for the fourth month out.

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

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

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

623

624

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

625 **ETC_F for the Real-Time Horizon**

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

627
$$ETC_F = SCH^+_7 + ASC^+_7 + RADJ/ETC \text{ Adjustment}$$

628 **Where:**

629 **SCH⁺₇** is the sum of the positive schedules that reference confirmed NITS_F, GF_F and
630 PTP_F reservations for the ATC Path for that period.

631 **ASC⁺₇** is the sum of the positive dynamic schedules that reference confirmed NITS_F,
632 GF_F and PTP_F reservations for the ATC Path for that period.

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

636 The following diagram illustrates how the variables used in BPA’s ETC_F calculation correspond
637 to the variables contained in the ETC_F algorithm shown in “Calculating Firm Existing
638 Transmission Commitments” beginning on p.13. ROR_F is not included in ETC_F for the Real-
639 time horizon because ROR_F is not relevant for the Real-time horizon.

ETC_F =	NITS_F	+	GF_F	+	PTP_F
	↓		↓		↓
	SCH⁺₇		SCH⁺₇		SCH⁺₇
	+		+		+
	ASC⁺₇		ASC⁺₇		ASC⁺₇
	+		+		+
	RADJ/ETC Adjustment		RADJ/ETC Adjustment		RADJ/ETC Adjustment

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

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

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

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

646
$$ETC_{NF} = RRES_{6,5,4,3,2,1}$$

647 **Where:**

648 $RRES_{6,5,4,3,2,1}$ is the sum of all confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2}
649 and PTP_{NF1} reservations.

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

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

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

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

655
$$ETC_{NF} = SCH^+_{6,5,4,3,2,1} + ASC^+_{6,5,4,3,2,1}$$

656 **Where:**

657 $SCH^+_{6,5,4,3,2,1}$ is the sum of the positive Demands of schedules referenced to
658 confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and PTP_{NF1} reservations, plus
659 the sum of the positive Demands of confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} ,
660 PTP_{NF2} and PTP_{NF1} reservations that have not yet been scheduled. Once these
661 reservations are scheduled, the schedule is used for ETC_{NF} , thereby adding back
662 the difference between the reservation and schedule amounts to ATC_{NF} .

663 $ASC^+_{6,5,4,3,2,1}$ is the sum of positive Demands of dynamic schedules referenced
664 to confirmed $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and PTP_{NF1} reservations for
665 the ATC Path.

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

669

670

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

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

673 BPA does not maintain CBM . Therefore BPA sets CBM_S at zero for all of its ATC Paths for
674 all time periods.

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

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

679 $Postbacks_{NF}$ are changes to non-firm Available Transfer Capability due to a change in the use
680 of Transmission Service for that period.
681

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

684 $Postbacks_{NF}$ for the Time Horizon Beyond Real-time

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

688 $Postbacks_{NF}$ for the Real-time Horizon

689 For ATC_{NF} calculations in the Real-time horizon, there is a circumstance in which BPA
690 uses $Postbacks_{NF}$, expressed as $RADJ/ETC$.

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

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

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

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

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

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

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

708 **VIII. Rated System Path Methodology for Flow-Based ATC Paths**

709 This section describes in detail how BPA implements the Rated System Path Methodology for
710 its flow-based ATC Paths listed in Table 2. It addresses all of the requirements in Standard
711 MOD-029-2a.

712 **BPA Flow-Based ATC Paths**

713 The following table shows the flow-based ATC Paths for which BPA uses the Rated System
714 Path Methodology, and the base case used to determine base **ETC** across each path:

715
716

Table 2
BPA's Flow-Based ATC Paths

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

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

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

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

717

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

719 BPA calculates TTC for its flow-based ATC Paths in the manner described in the “Calculating
720 Total Transfer Capability (TTC)” and “Process to Determine TTC” sections.

721 **Determining Existing Transmission Commitments (ETC) for Flow-Based ATC Paths**

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

723 BPA uses the WECC seasonal base cases and modifies them to calculate the base ETC for
724 its flow-based ATC Paths. BPA refers to these base cases as ETC Cases. The assumptions
725 used in these ETC Cases include normal operating conditions and system topology.

726

727 For BPA’s Balancing Authority, BPA uses a 1-in-2-year heavy load forecast for its heavy
728 load ETC cases. For the April and May light load ETC cases, BPA uses a 1-in-2-year scaled
729 heavy load forecast. For the Winter light load ETC case, the light loads in the WECC
730 Winter seasonal light load case are used.

731

732 Outside of BPA’s Balancing Authority, BPA uses the heavy load forecasts that are included
733 in the WECC seasonal cases for its heavy load ETC cases. For the April and May light load
734 ETC cases, BPA uses a scaled WECC Spring seasonal heavy load forecast. For the Winter
735 light load ETC case, the light loads in the WECC Winter seasonal light load case are used.

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

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

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

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

754 **Outages in ETC Calculations**

755 Generation outages known to BPA at the time BPA creates its ETC Cases are incorporated
756 into the generation dispatch assumptions in the base cases.

757 BPA calculates PTFDs by adjusting the WECC base cases to include Transmission outages in
758 BPA's outage system for BPA's area and any adjacent TSP areas. PTFDs are used in BPA's
759 ETC calculations. Note that BPA has no executed coordination Agreements with other
760 TSPs. (MOD-001 R3.6)

761 **Outage Criteria in ETC Calculations**

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

765 **Hourly ETC Calculations**

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

770 **Daily ETC Calculations**

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

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

779

780 **Monthly ETC Calculations**

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

785 **PTDF Analysis and *De Minimis***

786 BPA determines the impact of transactions on its flow-based ATC Paths by using PTDF
787 analysis. PTDF analysis is the fraction of energy (expressed as a percentage or as a
788 decimal) that will flow across BPA's monitored flow-based ATC Paths as that energy is
789 injected at a POR (or source) relative to a slack bus, and withdrawn at a POD (or sink)
790 relative to a slack bus, for each flow-based ATC Path. The flow-based ATC Path impacts
791 are determined using the following formula:

792 $(\text{POR PTDF} - \text{POD PTDF}) * \text{Demand} = \text{MW impact to flow-based ATC Path}$

793 If a reservation's impact on a flow-based ATC Path is less than or equal to 10 MW and the
794 PTDF difference is less than or equal to 10 percent of the reserved demand, the
795 reservation is deemed to have a *de minimis* impact on that flow-based ATC Path. When
796 using reservations, BPA does not account for *de minimis* MW amounts in its ETC
797 calculations.

798 **Source/POR and Sink/POD Identification and Mapping**

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

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

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

- 812 • If the source or POR has been identified in the reservation and is discretely
813 modeled in the WECC base cases, BPA uses the discretely modeled point as
814 the source.
- 815 • In cases where the source or POR has been identified in the reservation and
816 the point can be mapped to an "equivalent" or "aggregate" representation in
817 the WECC base cases, BPA maps the source to the equivalence point in the
818 WECC base cases. These points are published in the Transmission Service
819 Contract Points List on BPA's OASIS home page.

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

825 • BPA requires a specified source or POR to be identified for all reservations.

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

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

833 • In cases where the sink or POD has been identified in the reservation and the
834 point can be mapped to an “equivalent” or “aggregate” representation in the
835 WECC base case, BPA maps the sink or POD to the equivalence points in the
836 WECC base cases. These points are published in the Transmission Service
837 Contract Points list on BPA’s OASIS home page.

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

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

843 BPA has grouped the FCRPS generators in BPA’s BAA and the Mid-Columbia generators based
844 on the primary interface between BPA and the generation projects. These groupings are
845 assigned weighted PTDFs that represent how the generators participate in the group. The
846 weighted PTDF for the FCRPS bus point is derived from a “weighted FCRTS” bus point. The
847 PTDF weighting for this point varies across different time periods. For the daily and monthly
848 calculations beyond 16 days out, BPA derives the weighting of the PTDF by applying the
849 generation dispatch determined in the ETC Cases. For the hourly and daily calculations for
850 the next hour out to day 16, the PTDF weighting is derived from generation forecasts of the
851 federal resources produced for that time period. BPA derives the PTDF weighting for the Mid-
852 Columbia bus point by applying the generation dispatch determined in the ETC Cases.

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

862 **Calculating Firm Transmission Service for Flow-Based ATC Paths**

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

864 When calculating the impact of ETC_F for all time periods for a flow-based ATC Path, BPA uses
865 the following algorithm. (MOD-029 R5)

866
$$\text{ETC}_F = \text{NL}_F + \text{NITS}_F + \text{GF}_F + \text{PTP}_F + \text{ROR}_F + \text{OS}_F$$

867 **Where:**

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

871 BPA sets the NL_F at zero for all of its ATC Paths for all time periods. All of BPA's firm
872 Transmission obligations are captured in the NITS_F, PTP_F and GF_F components of this
873 algorithm.

874 **NITS_F** is the firm capacity reserved for Network Integration Transmission Service
875 serving Load, to include losses, and Load growth, not otherwise included in TRM or
876 CBM.

877 **GF_F** is the firm capacity set aside for grandfathered Transmission Service and contracts
878 for energy and/or Transmission Service, where executed prior to the effective date of
879 a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor
880 tariff."

881 **PTP_F** is the firm capacity reserved for confirmed Point-to-Point Transmission Service.

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

886 BPA assumes that all of its Transmission Service Agreements that are eligible to roll-
887 over in the future will be rolled over, unless roll-over rights are not exercised by the
888 required deadline.

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

891 BPA has no other firm services beyond those specified above. Therefore BPA sets OS_F
892 at zero for all time periods.

893 BPA divides ETC_F into two components: the base ETC values determined using the ETC Cases,
894 and interim ETC_F impacts determined using PTDF analysis. These components are added
895 together to calculate a final ETC_F.

896 As described in the “PTDF Analysis and *De Minimis*” section, *de minimis* MW amounts of
897 reservations that were not modeled in the ETC Cases are not accounted for when calculating
898 ETC_F using reservations. However, all schedules are accounted for in ETC_F regardless of their
899 PTDF analysis impact on BPA’s flow-based ATC Paths when calculating ETC_F using schedules.

900 While BPA includes all of the components described above in ETC_F, BPA accounts for NITS_F,
901 GF_F, PTP_F and ROR_F in its flow-based ATC Path ATC calculations using different variables. For
902 descriptions of the variables used, see the “Calculating Firm Available Transfer Capability”
903 section of this document.

904 **Determining Base ETC for Heavy Load Base Cases**

905 BPA creates heavy load ETC Cases for the months of January, February, April, May, June,
906 July, August, September, October, November and December to calculate base ETC values.
907 BPA’s ETC Cases are produced using a power flow model that computes how much power will
908 flow over each flow-based ATC Path for the assumed Load and generation levels for each time
909 period studied. Counterflows are inherently modeled in these base cases.

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

912 **System topology:** Normal operating conditions are used. BPA uses the WECC Winter
913 seasonal case for its November, December, January and February ETC base cases, the
914 WECC Spring seasonal case for its April and May ETC base cases, and the WECC
915 Summer seasonal case for its June, July, August, September and October ETC base
916 cases.

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

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

922

923 **Generation:**

924 For the generators in BPA’s Balancing Authority or directly interconnected to BPA,
925 BPA uses the following generation assumptions:

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

929 • The Columbia Generating Station is assumed to be on-line at full Load in the
 930 ETC cases. Generation levels at the Libby, Hungry Horse, Dworshak, and Albeni
 931 Falls projects are set based on the requirements set forth in the 2000 Biological
 932 Opinion. In addition, the generation levels at the Willamette Valley projects⁵
 933 are set at the minimum levels seen by season during Calendar Year
 934 2001. **Nameplate Adjusted Method:** When creating heavy load ETC Cases,
 935 generation levels for all other federal hydro projects⁶ are set by first
 936 determining the nameplate for each project and then adjusting such
 937 nameplates by outages forecasted for the particular plants. Next in the month
 938 of August, the Lower Snake plants (Lower Granite, Lower Monumental, Little
 939 Goose, and Ice Harbor) are capped at the observed project outflow over the
 940 past ten Augusts. Then multiple generation scenarios are modelled by stressing
 941 one of three different “zones” of Federal hydro resources to the nameplate
 942 adjusted generation levels described above and scales the generation at the
 943 remaining Federal hydro projects to match the sum of the demands for all
 944 contracts that call out non-specific Federal hydroelectric projects as PORs
 945 after adjusting these demands for the portion served by Columbia Generating
 946 Station, Libby, Hungry Horse, Dworshak, Albeni Falls, and the Willamette
 947 Valley projects. The Federal PTP demands at each project are then added to
 948 this result to obtain the final assumed generation level for each Federal hydro
 949 project. This overall method for modeling the federal resources is referred to
 950 as the “Nameplate Adjusted Method.”

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

954 **Wind Generators:**

- 955 • **PTP_F:** Wind generators associated with PTP_F Long-Term Reservations are set at
 956 the greater of the following:
 - 957 ○ Modeled on at 100 percent of the contract demand for the wind
 958 generator; or
 - 959 ○ Modeled off and replaced by the “Balancing Logic Method”.
- 960 • **NITS_F:** The flow-based ATC Path impacts of wind generators identified as
 961 designated network resources in NITS_F contracts or in the NT Resources
 962 Memorandum of Agreement in BPA’s area are determined on a flow-based ATC
 963 Path-by-flow-based ATC Path basis and set at the greater of the following:

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.

- 964 ○ The wind generators modeled on at the designated amount of the wind
- 965 generators; or,
- 966 ○ The wind generators modeled off and replaced by increasing the FCRPS
- 967 generation level by the designated amount of the wind generators using
- 968 the “Nameplate Adjusted Method” for all ETC cases described above.

969 Wind generators designated as network resources in NITS_F contracts for all
 970 adjacent TSPs are modeled up to the designated amount.

- 971 • **GF_F**: BPA and all of BPA’s adjacent TSPs have no GF_F contracts for wind
- 972 generators.

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

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

978 When creating heavy load ETC Cases, if there is more generation than load plus
 979 committed exports in the base case, BPA reduces all excess generation prorata, except for
 980 the stressed FCRPS zone, using the “Balancing Logic Method”; the exports modeled on the
 981 COI and Pacific DC Intertie in the base case are reduced to match BPA’s obligation for firm
 982 export. The generation reduction is done to bring generation and load into balance in
 983 order to solve the power flow model.

984 **Sensitivity Studies for Heavy Load Base Cases**

985 In calculating its base ETC values, BPA runs ETC Case Scenarios for three different
 986 sensitivities: the Canadian Entitlement Return (CER) obligation modeled on or off, wind
 987 resources designated to serve PTP_F and NITS_F on or off, and stressing the three different
 988 zones of the FCRPS.

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

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

996 In the case where BPA models the FCRPS generators delivering energy to Canada, exports
 997 to Canada for the CER and the FCRPS generation level using the “Nameplate Adjusted
 998 Method” are increased by the amount specified in the Canadian Entitlement Agreement.

999 In the case where BPA models the FCRPS generators not delivering energy to Canada,
 1000 exports to Canada for the CER and the FCRPS generation levels using the “Nameplate
 1001 Adjusted Method” are reduced by the MW amount specified in the Canadian Entitlement
 1002 Agreement.

1003 For the wind resource scenarios, see above for a description of the base ETC assumptions
 1004 for wind generators serving PTP_F and NITS_F.

1005 Therefore, in its heavy load base ETC sensitivity analysis, BPA models the following 6
1006 scenarios:

- 1007 1. Wind modeled off/Upper Columbia stressed
- 1008 2. Wind modeled off/Lower Snake stressed
- 1009 3. Wind modeled off/Lower Columbia stressed
- 1010 4. Wind modeled on/Upper Columbia stressed
- 1011 5. Wind modeled on/Lower Snake stressed
- 1012 6. Wind modeled on/Lower Columbia stressed

1013 All scenarios are run for (i) April, May, June, July, August, September and October with
1014 CER modeled off and (ii) November, December, January and February with CER modeled
1015 on.

1016 BPA uses the highest base ETC value calculated from these scenarios in its firm ATC
1017 calculations across the flow-based ATC Paths. BPA uses the lowest base ETC value from
1018 these scenarios in its non-firm ATC calculations across the flow-based ATC Paths. The
1019 lowest base ETC value is accounted for using an SADJ in the non-firm ATC calculation.

1020 BPA derives a 12-month profile of base ETC values by using a weighted average for March.
1021 The following table shows the base ETC used for each month for heavy load ETC Cases.

1022

1023

1024

Table 3
Weighted Average Base ETC Values

Month	Percentage Used	Base ETC Values Used
January	100	January
February	100	February
March	50 50	January May
April	100	April
May	100	May
June	100	June
July	100	July
August	100	August
September	100	September
October	100	October
November	100	November
December	100	December

1025 **Determining Base ETC and Sensitivities for Light Load Base Cases**

1026 BPA uses the WECC Winter seasonal light load case as the starting point for its Winter
1027 seasonal light load ETC base case. The ETC from this case is used as the base ETC for the
1028 months of November through March.

1029 BPA uses the WECC Spring seasonal light load case as the starting point for its April and
1030 May light load ETC base cases. The ETC from the April case is used as the base ETC for
1031 the month of April. The ETC from the May case is used as the base ETC for the months of
1032 May through October.

1033 BPA uses the following assumptions in light load ETC base cases:

- 1034 a. System topology: Normal operating conditions are used.
- 1035 b. Generation: BPA uses generation assumptions from historical data. Canadian
1036 Entitlement is modeled as delivering energy to Canada in the amount specified in
1037 the Canadian Entitlement Agreement.

1038 There are two sensitivity studies performed for the light load ETC base cases:

- 1039 a. Federal generation east of the path is increased, and a corresponding amount of
1040 federal generation west of the path is reduced
- 1041 b. Federal generation east of the path is reduced, and a corresponding amount of
1042 federal generation west of the path is increased

1043 BPA uses the highest base ETC value calculated from these scenarios in its firm ATC
1044 calculations across the flow-based ATC Paths where light load cases are utilized. BPA uses
1045 the lowest base ETC value from these scenarios in its non-firm ATC calculations across the
1046 flow-based ATC Paths where light load cases are utilized. The lowest base ETC value is
1047 accounted for using an SADJ in the non-firm calculation.

1048 **Determining Interim ETC_F Using PTDF Analysis**

1049 To calculate the impacts for all NITS_F and PTP_F reservations for BPA's area that were not
1050 modeled in the ETC Cases, BPA uses PTDF analysis on all of the Demand reserved (see
1051 "PTDF Analysis and *De Minimis*" section). PTDFs are assigned and mapped to individual
1052 bus points in the WECC base cases (refer to "Source/Sink and POR/POD Identification and
1053 Mapping" section). The sum of these impacts is referred to as the interim ETC_F value, and
1054 is added to the base ETC values to produce a final ETC_F value for each time period for
1055 each flow-based ATC Path.

1056 **Calculating Firm Available Transfer Capability (ATC_F)**

1057 When calculating ATC_F for its flow-based ATC Paths for all time periods, BPA uses the
1058 following algorithm. (MOD-029 R7)

1059
$$ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + Counterflows_F$$

1060

1061 **Where:**

1062 ATC_F is the firm Available Transfer Capability for the flow-based ATC Path for that period.

1063 TTC is the Total Transfer Capability of the flow-based ATC Path for that period.

1064 See “Establishing Total Transfer Capability” for a discussion of how BPA establishes
1065 $TTCs$.

1066 ETC_F is the sum of existing firm commitments for the Flow-based ATC Path during that
1067 period.

1068 In BPA’s calculations, ETC_F is expressed as follows:

1069
$$ETC_F = LRES + SRES - SADJ/ETC \text{ Adjustments} + LETC$$

1070 **Where:**

1071 $LRES$ is the sum of the positive impacts of Long-Term Reservations for BPA’s area

1072 $SRES$ is the sum of the positive impacts of Short-Term Reservations for BPA’s area

1073 **SADJ/ETC Adjustments** is the variable used to make adjustments to ETC_F not captured
1074 in $LRES$ or $SRES$. One such adjustment is applied to allow BPA to conduct deferral
1075 competitions, as required in Section 17.7 of BPA’s OATT. When a deferral reservation
1076 is confirmed, BPA applies an ETC adjustment to hold out Transfer Capability for the
1077 time period deferred, starting at the latter of five months out or the service
1078 commencement date of the original reservation, to allow for a competition. At four
1079 months out, if no competition is identified, the ETC adjustment is modified to add
1080 back Transfer Capability for the fourth month out.

1081 Additionally, BPA uses SADJ adjustments to represent the CER Off/On scenarios for the
1082 Cross Cascades North, Cross Cascades South, and North of Echo Lake ATC Paths. This is
1083 a PTDF adjustment that will apply to the months March through October (applied to
1084 the May, and August Base Case values to account for ETC_F).

1085 BPA also uses SADJ/ETC adjustments to ensure accurate accounting of ETC_F . These
1086 adjustments may be performed to account for situations such as data modeling
1087 corrections, and will be noted in the descriptions of the adjustments.

1088 $LETC$ is used to align the ETC calculated in the power flow base case with additional
1089 PTDF calculations in order to balance to the standard OATI calculation.

1090 This adjustment is derived by comparing two values: a) the impacts of the confirmed
1091 PTP_F , GF_F and $NITS_F$ Long-Term Reservations derived from the base ETC Cases and b)
1092 the impacts of the same reservations calculated using PTDF Analysis for each flow-
1093 based ATC Path. The adjustment for each flow-based ATC Path is equal to the
1094 difference of these two values. Conditional firm reservations are not included in the
1095 ETC Cases and therefore are also not included in this comparison.

1096 As described in the “PTDF Analysis and *De Minimis*” section, *de minimis* MW amounts
 1097 of reservations that were not included in the ETC Cases are not accounted for when
 1098 calculating ETC_F using reservations.

1099 The following diagram illustrates how the variables used in BPA’s ETC_F calculation
 1100 correspond to the variables contained in the ETC_F algorithm shown in the “Calculating
 1101 Firm Existing Transmission Commitments section.

ETC _F =	NITS _F	+	GF _F	+	PTP _F	+	ROR _F
	↓		↓		↓		↓
	LRES		LRES		LRES		LRES
	+				+		
	SRES				SRES		
	+		+		+		+
	LETC		LETC		LETC		LETC
	-		-		-		-
	SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments		SADJ/ETC Adjustments

1102 **CBM** is the Capacity Benefit Margin on the flow-based ATC Path during that period.

1103 BPA does not maintain CBM. Therefore BPA sets CBM at zero for all of its flow-based
 1104 ATC Paths for all time periods.

1105 **TRM** is the Transmission Reliability Margin on that flow-based ATC Path during that period.

1106 BPA does not maintain TRM on its flow-based ATC Paths. Therefore BPA sets TRM at
 1107 zero for all of its flow-based ATC Paths for all time periods.

1108 **Postbacks_F** are changes to ATC_F due to a change in the use of Transmission Service for
 1109 that period

1110 Because BPA automatically recalculates ETC_F whenever there is a reduction in LRES or
 1111 SRES, BPA does not use Postbacks_F for calculating ATC_F on any of its flow-based ATC
 1112 Paths. Therefore BPA sets Postbacks_F at zero for all of its flow-based ATC Paths for all
 1113 time periods.

1114 **Counterflows_F** are adjustments to ATC_F as determined by the Transmission Service
 1115 Provider and specified in their ATCID

1116 BPA does not include confirmed Transmission reservations, expected interchange or
 1117 internal flow counter to the direction of the flow-based ATC Path over and above the
 1118 counterflow that is assumed in the ETC Cases. BPA’s rationale is that it does not want
 1119 to offer additional firm Transfer Capability due to counterflow that may not be
 1120 scheduled, as it could lead to Curtailments of Firm Transmission Service in Real-time.
 1121 (MOD-001 R3.2) Therefore BPA sets the Counterflows_F component at zero for all of its
 1122 flow-based ATC Paths for all time periods.

1123 As described in the “Determining Base ETC” section, counterflows are modeled in the
1124 ETC Cases. In instances where the power flow study results in a negative base ETC
1125 value, BPA uses zero as the base ETC for purposes of calculating ATC_F . This is done to
1126 ensure that BPA does not make capacity available as a result of counterflows that may
1127 or may not materialize in real-time.

1128 **Calculating Non-Firm Transmission Service for Flow-Based ATC Paths**

1129 BPA sells six non-firm Transmission products. These products are:

- 1130 1. $NITS_{NF6}$. This is a non-firm Transmission product available only to Transmission
1131 Customers with NITS Agreements. It is the highest quality of Non-Firm
1132 Transmission Service in that it is the last Non-Firm Transmission Service that would
1133 be Curtailed, if necessary.
- 1134 2. PTP_{NF5} . This is a non-firm Transmission product available only to Transmission
1135 Customers with PTP Agreements. PTP_{NF5} is the fifth Non-Firm Transmission Service
1136 that would be Curtailed, if necessary.
- 1137 3. PTP_{NF4} . This is a non-firm Transmission product available only to Transmission
1138 Customers with PTP Agreements. PTP_{NF4} is the fourth Non-Firm Transmission
1139 Service that would be Curtailed, if necessary.
- 1140 4. PTP_{NF3} . This is a non-firm Transmission product available only to Transmission
1141 Customers with PTP Agreements. PTP_{NF3} is the third Non-Firm Transmission Service
1142 that would be Curtailed, if necessary.
- 1143 5. PTP_{NF2} . This is a non-firm Transmission product available only to Transmission
1144 Customers with PTP Agreements. PTP_{NF2} is the second Non-Firm Transmission
1145 Service that would be Curtailed, if necessary.
- 1146 6. PTP_{NF1} . This is a non-firm Transmission product available only to Transmission
1147 Customers with PTP Agreements. PTP_{NF1} is the first Non-Firm Transmission Service
1148 that would be Curtailed, if necessary (i.e., this Transmission Service has the
1149 highest likelihood of being Curtailed).

1150 BPA calculates ETC_{NF} and ATC_{NF} for each of these products.

1151 **Calculating Non-Firm Existing Transmission Commitments (ETC_{NF})**

1152 When calculating ETC_{NF} for all time periods for a flow-based ATC Path, BPA sums the
1153 positive impacts using PTDF analysis (see “PTDF Analysis and *De Minimis*” section for
1154 further details). (MOD-029 R6)

$$1155 \quad ETC_{NF} = NITS_{NF} + GF_{NF} + PTP_{NF} + OS_{NF}$$

1156 **Where:**

1157 $NITS_{NF}$ is the non-firm capacity set aside for Network Integration Transmission Service
1158 serving Load (i.e., secondary service), to include losses, and Load growth not
1159 otherwise included in TRM or CBM.

1160 In BPA’s calculations, this is $NITS_{NF6}$. BPA’s $NITS_{NF6}$ calculations do not include losses or
1161 Load growth, since losses and Load growth are already set aside as firm capacity in
1162 $NITS_F$.

1163 GF_{NF} is the non-firm capacity set aside for grandfathered Transmission Service and
1164 contracts for energy and/or Transmission Service, where executed prior to the
1165 effective date of a Transmission Service Provider’s Open Access Transmission Tariff or
1166 “safe harbor tariff.”

1167 BPA does not have any grandfathered non-firm Transmission Service obligations and
1168 therefore BPA sets GF_{NF} at zero for all of its flow-based ATC Paths for all time periods.

1169 PTP_{NF} is non-firm capacity reserved for confirmed Point-to-Point Transmission Service.

1170 In BPA’s calculations, the PTP_{NF} component includes PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} and
1171 PTP_{NF1} .

1172 OS_{NF} is the non-firm capacity reserved for any other service(s), contract(s), or
1173 agreement(s) not specified above using non-firm transmission service as specified in
1174 the ATCID.

1175 BPA has no other non-firm services beyond those specified above. Therefore BPA sets
1176 OS_{NF} at zero for all of its flow-based ATC Paths for all time periods.

1177 As described in the “PTDF Analysis and *De Minimis*” section, BPA does not account for *de*
1178 *minimis* MW amounts when calculating ETC_{NF} using reservations. However, all schedules
1179 are accounted for in ETC_{NF} regardless of their PTDF analysis impact on BPA’s flow-based
1180 ATC Paths when calculating ETC_{NF} using schedules.

1181 While BPA includes all of the components described above in ETC_{NF} , BPA accounts for
1182 PTP_{NF} and $NITS_{NF}$ in its flow-based ATC Path calculations using different variables. For a
1183 description of the variables used see p. 44.

1184 **Calculating Non-Firm Available Transfer Capability (ATC_{NF})**

1185 BPA uses different algorithms to calculate ATC_{NF} , ETC_F and ETC_{NF} for two time horizons for
1186 all of its flow-based ATC Paths: Real-time and beyond Real-time. The Real-time horizon
1187 begins at 10 p.m. on the pre-schedule day for the 24 hours in the next day. The ETC_F and
1188 ETC_{NF} for the Real-Time horizon are calculated using schedules and reservations that have
1189 not yet been scheduled. The time horizon beyond Real-time includes hourly for the hours
1190 after those included in the Real-time period as well as daily and monthly calculations.
1191 The ETC_F and ETC_{NF} for the time horizon beyond Real-time is calculated using
1192 reservations.

1193 BPA calculates ETC_{NF} and ATC_{NF} for the six non-firm Transmission products associated with
1194 NERC Curtailment priorities as follows:

1195 1. ATC_{NF6} : ATC_{NF6} is calculated for the $NITS_{NF6}$ product. ETC_{NF} in this equation only
1196 includes $NITS_{NF6}$.

1197 2. ATC_{NF5} : ATC_{NF5} is calculated for the PTP_{NF5} product. ETC_{NF} in this equation
1198 includes $NITS_{NF6}$ and PTP_{NF5} .

1199 3. ATC_{NF4} : ATC_{NF4} is calculated for the PTP_{NF4} product. ETC_{NF} in this equation
1200 includes $NITS_{NF6}$, PTP_{NF5} and PTP_{NF4} .

1201 4. ATC_{NF3} : ATC_{NF3} is calculated for the PTP_{NF3} product. ETC_{NF} in this equation
1202 includes $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , and PTP_{NF3} .

1203 5. ATC_{NF2} : ATC_{NF2} is calculated for the PTP_{NF2} product. ETC_{NF} in this equation
1204 includes $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , PTP_{NF3} and PTP_{NF2} .

1205 6. ATC_{NF1} : ATC_{NF1} is calculated for the PTP_{NF1} product. ETC_{NF} in this equation
1206 includes $NITS_{NF6}$, PTP_{NF5} , PTP_{NF4} , and PTP_{NF3} , PTP_{NF2} and PTP_{NF1} .

1207 BPA calculates ETC_{NF} and ATC_{NF} for each of these products for each time period.

1208 When calculating ATC_{NF} for its flow-based ATC Paths for the two time horizons described
1209 above, BPA uses the following algorithm. (MOD-029 R8)

$$1210 \quad ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_S - TRM_U + Postbacks_{NF} + Counterflow_{NF}$$

1211 **Where:**

1212 ATC_{NF} is the non-firm Available Transfer Capability for the flow-based ATC Path for
1213 that period.

1214 BPA calculates six ATC_{NF} values (as described above), one for each of the six non-
1215 firm Transmission products.

1216 **TTC** is the Total Transfer Capability of the flow-based ATC Path for that period.

1217 See the “Establishing Total Transfer Capability” section for a description of how
1218 BPA establishes **TTC**.

1219 ETC_F is the sum of existing firm commitments for the flow-based ATC Path during that
1220 period.

1221 BPA uses different algorithms to calculate ETC_F for all of its flow-based ATC Paths
1222 for the time horizon beyond Real-time and the Real-time horizon.

1223 **ETC_F for the Time Horizon Beyond Real-Time**

1224 For flow-based ATC Path ATC_{NF} calculations for the time horizon beyond Real-time,
1225 ETC_F is expressed as follows:

1226
$$ETC_F = LRES + SRES - SAdj/ETC \text{ Adjustments} + LETC$$

1227 **Where:**

1228 **LRES** is the sum of the positive impacts of Long-Term Reservations for BPA’s area

1229 **SRES** is the sum of the positive impacts of Short-Term Reservations for BPA’s area

1230 **SADJ/ETC Adjustments** is the variable used to make adjustments to ETC_F not captured
1231 in LRES or SRES. One such adjustment is applied to allow BPA to conduct deferral
1232 competitions, as required in Section 17.7 of BPA’s OATT. When a deferral reservation
1233 is confirmed, BPA applies an ETC adjustment to hold out Transfer Capability for the
1234 time period deferred, starting at the latter of five months out or the service
1235 commencement date of the original reservation, to allow for a competition. At four
1236 months out, if no competition is identified, the ETC adjustment is modified to add
1237 back Transfer Capability for the fourth month out.

1238 BPA uses SADJs to properly reflect the lowest base ETC value from its ETC base cases
1239 in its non-firm ATC calculation. Additionally, BPA uses SADJ adjustments to represent
1240 the CER Off/On scenarios for the Cross Cascades North, Cross Cascades South, and
1241 North of Echo Lake ATC Paths. This is a PTDF adjustment that will apply to the months
1242 March through October (applied to the May, and August Base Case values to account
1243 for ETC_F).

1244 BPA also uses SADJ/ETC adjustments to ensure accurate accounting of ETC_F . These
1245 adjustments may be performed to account for situations such as data modeling
1246 corrections, and will be noted in the descriptions of the adjustments.

1247 LETC is used to align the ETC calculated in the power flow base case along with
1248 additional PTDF calculations in order to balance to the standard OATI calculation.

1249 This adjustment is derived by comparing two values: a) the impacts of the PTP_F , GF_F
1250 and $NITS_F$ Long-Term Reservations derived from the base ETC Cases and b) the impacts
1251 of the same reservations calculated using PTDF Analysis for each flow-based ATC Path.
1252 The adjustment for each flow-based ATC Path is equal to the difference of these two
1253 values. Conditional firm reservations are not included in the ETC Cases and therefore
1254 are also not included in this comparison.

1255 As described in the “PTDF Analysis and *De Minimis*” section, *de minimis* MW amounts
1256 of reservations that were not included in the ETC Cases are not accounted for in ETC_F .

1257 The following diagram illustrates how the variables used in BPA’s ETC_F calculation
1258 correspond to the variables contained in the ETC_F algorithm shown in “Calculating
1259 Firm Existing Transmission Commitments” section.

1260

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

1261 **ETC_F for the Real-Time Horizon**

1262 For flow-based ATC Path ATC_{NF} calculations in the Real-time horizon, ETC_F is expressed
1263 as follows:

1264
$$ETC_F = SCH_7^+ + ASC_7^+$$

1265 **Where:**

1266 **SCH₇⁺** is the sum of the positive impacts of schedules referenced to confirmed PTP_F,
1267 GF_F and NITS_F reservations for BPA’s area.

1268 **ASC₇⁺** is the sum of the positive impacts of dynamic schedules that reference
1269 confirmed PTP_F, GF_F and NITS_F reservations for BPA’s area.

1270 The following diagram illustrates how the variables used in BPA’s ETC_F calculation
1271 correspond to the variables contained in the ETC_F algorithm shown in the “Calculating
1272 Firm Existing Transmission Commitments” section. ROR_F is not included in ETC_F for
1273 the Real-Time Horizon because ROR_F is not relevant for this time period.

ETC_F =	NITS_F	+	GF_F	+	PTP_F
	↓		↓		↓
	SCH ₇ ⁺		SCH ₇ ⁺		SCH ₇ ⁺
	+		+		+
	ASC ₇ ⁺		ASC ₇ ⁺		ASC ₇ ⁺

1274 **ETC_{NF}** is the sum existing non-firm Transmission commitments for the flow-based ATC
1275 Path during that period.

1276 BPA uses different algorithms to calculate ETC_{NF} for all of its flow-based ATC Paths for
 1277 the time horizon beyond Real-time and the Real-time horizon.

ETC_{NF} for the Time Horizon Beyond Real-time

1278 For flow-based ATC Path ATC_{NF} calculations in the time horizon beyond Real-time,
 1280 ETC_{NF} is expressed as follows:

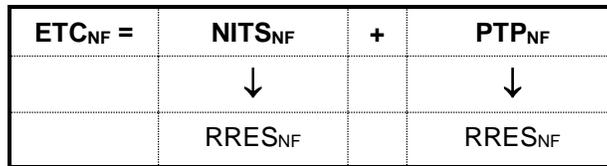
$$ETC_{NF} = RRES_{NF}$$

1282 **Where:**

1283 $RRES_{NF}$ is the sum of the positive impacts of all confirmed PTP_{NF5} , PTP_{NF4} , PTP_{NF3} , PTP_{NF2} ,
 1284 PTP_{NF1} and $NITS_{NF6}$ reservations for BPA’s area

1285 As described in the “PTDF Analysis and *De Minimis*” section, *de minimis* MW amounts are not
 1286 accounted for in ETC_{NF} when using reservations.

1287 The following diagram explains how the variables used in BPA’s ETC_{NF} calculation correspond
 1288 to the variables contained in the ETC_{NF} algorithm shown in “Calculating Non-Firm Existing
 1289 Transmission Commitments”.



ETC_{NF} for the Real-time Horizon

1291 For flow-based ATC Path ATC_{NF} calculations in the Real-time horizon, ETC_{NF} is
 1292 expressed as follows:

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

1294 **Where:**

1295 $SCH^{+}_{6,5,4,3,2,1}$ is the sum of the positive impacts of schedules referenced to confirmed
 1296 PTP_{NF2} , PTP_{NF1} and $NITS_{NF6}$ reservations for BPA’s area.

1297 $ASC^{+}_{6,5,4,3,2,1}$ is the sum of positive impacts of dynamic schedules referenced to
 1298 confirmed PTP_{NF2} , PTP_{NF1} and $NITS_{NF6}$ reservations for BPA’s area.

1299 The following diagram illustrates how the variables used in BPA’s ETC_{NF} calculation correspond
 1300 to the variables contained in the ETC_{NF} algorithm shown in “Calculating Non-Firm Existing
 1301 Transmission Commitments.”

1302

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}

1303 **CBM_S** is the Capacity Benefit Margin for the flow-based ATC Path that has been
1304 scheduled during that period.

1305 BPA does not maintain CBM. Therefore BPA sets **CBM_S** at zero for all of its flow-
1306 based ATC Paths for all time periods.

1307 **TRM_U** is Transmission Reliability Margin for the flow-based ATC Path that has not been
1308 released for sale (unreleased) as non-firm capacity by the Transmission Service
1309 Provider during that period.

1310 BPA does not maintain TRM on its flow-based ATC Paths. Therefore BPA sets **TRM_U**
1311 at zero for all of its flow-based ATC Paths for all time periods.

1312 **Postbacks_{NF}** are changes to non-firm Available Transfer Capability due to a change in
1313 the use of Transmission Service for that period.

1314 Because BPA automatically recalculates **ETC_F** and **ETC_{NF}** whenever there is a
1315 reduction in LRES, SRES, or RRES, BPA does not use **Postbacks_{NF}** for calculating
1316 **ATC_{NF}** for any of its flow-based ATC Paths in the time horizon beyond Real-time.

1317 BPA also does not use **Postbacks_{NF}** for any of its flow-based ATC Paths for the Real-
1318 time horizon.

1319 Therefore BPA sets **Postbacks_{NF}** at zero for all of its flow-based ATC Paths for the
1320 time horizon beyond Real-time and the Real-time horizon.

1321 **Counterflows_{NF}** are adjustments to non-firm Available Transfer Capability as
1322 determined by the Transmission Service Provider and specified in its ATCID.

1323 Counterflows resulting from firm and non-firm Transmission schedules, excluding
1324 dynamic schedules, are added back to **ATC_{NF}** in the **Counterflows_{NF}** component.

1325 **Counterflows_{NF}** is the sum of the negative impacts of schedules referenced to
1326 confirmed firm and non-firm reservations in BPA’s area. In BPA’s calculations,
1327 **Counterflows_{NF}** is expressed as SCH^{7,6,5,4,3,2,1}.

1328 As described in the “Determining Base ETC” section, counterflows are modeled in the
1329 ETC Cases used to determine **ETC_F**. In instances where the power flow study results in
1330 a negative base ETC value, BPA uses zero as the base ETC for purposes of calculating
1331 **ATC_{NF}**. This is done to ensure that BPA does not make capacity available as a result of
1332 counterflows that may or may not materialize in real-time.

1333 In some cases, the amount of Counterflows_{SNF} exceeds the sum of the ETC_F and ETC_{NF},
1334 which, when added to TTC, results in ATC_{NF} greater than TTC.

1335 Adjustments to flow-based ATC Path ATC Values

1336 There may be instances where BPA needs to perform testing in the production environment of
1337 the systems that manage BPA's ATC calculations. In these instances, BPA may adjust its ATC
1338 values across the flow-based ATC Paths to ensure that Hourly requests are not declined due to
1339 lack of ATC across the flow-based paths. BPA will issue a notice to customers with the details
1340 prior to performing this testing.

1341 IX. Data Sources and Recipients

1342 BPA receives data for use in its ATC calculations, and provides data for use in calculating 1:1
1343 and flow-based ATC Path capabilities through the WECC base case process described
1344 beginning on p. 2. BPA also directly receives and provides data, such as outage information
1345 and specific Transmission commitments, from and to the following Transmission Service
1346 Providers and Transmission Operators: (MOD-001 R3.3, R3.4)

- 1347 • Avista Corporation
- 1348 • BC Hydro
- 1349 • California Independent System Operator
- 1350 • City of Tacoma, Department of Public Utilities, Light Division
- 1351 • Eugene Water and Electric Board
- 1352 • Fortis BC
- 1353 • Idaho Power Company
- 1354 • Los Angeles Department of Water and Power
- 1355 • NV Energy
- 1356 • NorthWestern Energy
- 1357 • Pacific Gas & Electric
- 1358 • PacifiCorp
- 1359 • Pend Oreille County Public Utility District No. 1
- 1360 • Portland General Electric
- 1361 • Public Utility District No. 1 of Chelan County
- 1362 • Public Utility District No. 1 of Clark County
- 1363 • Public Utility District No. 1 of Douglas County
- 1364 • Public Utility District No. 2 of Grant County, Washington
- 1365 • Public Utility District No. 1 of Snohomish County
- 1366 • Puget Sound Energy, Inc.
- 1367 • Sacramento Municipal Utility District
- 1368 • Seattle City Light
- 1369 • Southern California Edison
- 1370 • Transmission Agency of Northern California

- 1371 • Western Area Power Administration - Sierra Nevada Region
1372 • California Independent System Operator

1373 X. Responding to Data Requests

1374 Upon official request from any Transmission Service Provider, Planning Coordinator,
1375 Reliability Coordinator, or Transmission Operator for any data from the list below, solely for
1376 use in the requestor's ATC or AFC calculations, BPA will begin to make the data available
1377 within 30 calendar days of receiving the request.

- 1378 • Expected generation and Transmission outages, additions, and retirements
- 1379 • Load forecasts
- 1380 • Unit commitments and order of dispatch, to include all designated resources (BPA does
- 1381 not have resources that are committed or have the legal obligation to run)
- 1382 • Firm NITS and non-firm NITS (i.e. Secondary Service)
- 1383 • Firm and non-firm Transmission reservations
- 1384 • Grandfathered obligations
- 1385 • Firm roll-over rights
- 1386 • Any firm and non-firm adjustments applied by BPA to reflect parallel path impacts
- 1387 • Power flow models and underlying assumptions
- 1388 • Contingencies, provided in one or more of the following formats:
 - 1389 ○ A list of Elements
 - 1390 ○ A list of flow-based ATC Paths
 - 1391 ○ A set of selection criteria that can be applied to the WECC base cases used by
 - 1392 BPA
- 1393 • Facility Ratings
- 1394 • Any other service that impact ETCs
- 1395 • Values of CBM and TRM for all ATC Paths
- 1396 • Values of TTC and ATC for all ATC Paths
- 1397 • Source and sink identification and mapping to the WECC base cases

1398 BPA will make this data available on the schedule specified by the requestor (but no more
1399 frequently than once per hour, unless mutually agreed to by the requestor and Bonneville).

1400 For a Transmission Service Provider, Planning Coordinator, Reliability Coordinator, or
1401 Transmission Operator to officially request data to use in ATC or AFC calculations, the
1402 requestor must fill out the **Data Request Form** (MOD-001 R9) found on BPA's website
1403 <https://www.bpa.gov/transmission/Doing%20Business/ATCMethodology/Pages/default.aspx>.
1404 The completed request form must be sent to nercatcstandards@bpa.gov with **Data request**
1405 **Form** (MOD-001 R9) in the subject line. (MOD-001 R9)

1406 **XI. ATCID Revisions**

1407 BPA will notify the entities contained in ATCID TP Distribution List when implementing a new
 1408 or revised ATCID and make its current ATCID available. (MOD-001 R4, R5)

1409 **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
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>	L Trolese

ATCID Revision History

		<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> <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. 39 lines 1068-1070, P. 40 lines 1077-1079 and lines 1087-1089: Removed language referring to the month of August.	L Trolese

ATCID Revision History			
		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.	
6.0	11/1/2011	P.31 Table 2 BPA Flowgates: Added the McNary - John Day #2 500 kV line to the West of McNary Flowgate definition. Appendix C: Updated the SOL Methodology.	L Beckman
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. 5, P. 22, P. 29: Defined BPA's TRM practice for the Northern Intertie S>N Path. P. 20 line 528 and P. 23 line 597: Replaced NI Holdout in the ATC _F formula with TRM.	L Beckman
10.0	02/14/2012	P.30-31 Table 2 BPA Flowgates: Corrected the following flowgate definitions: South of Allston Flowgate: replaced Astoria-Seaside 115kV; and Lewis & Clark-Astoria Tap 115kV line with Astoria-Seaside 115kV; and Clatsop 230/115kV line in the South of Allston Flowgate Transmission Line Components. North of John Day Flowgate: replaced Wautoma-John Day 500kV line with Wautoma-Rock Creek 500kV line in the North of John Day Flowgate Transmission Line Components. Cross Cascades North Flowgate: Added the Anderson Canyon-Beverly Park 115 kV line to the Cross Cascades North Flowgate Transmission Line Components. Cross Cascades South Flowgate: replaced Hanford-Ostrander 500kV line with Wautoma-Ostrander 500kV line, replaced McNary-Santiam 230kV line with Jones Canyon-Santiam 230kV line, replaced Parkdale-Troutdale 230kV with Big Eddy-Troutdale 230kV, and added Bethel - Round Butte 230 kV line in the Cross Cascades South Flowgate Transmission Line Components. West of McNary Flowgate: replaced McNary-Santiam 230kV line with Jones Canyon-Santiam 230kV line in the West of McNary Flowgate Transmission Line Components.	L Beckman
11.0	02/22/2012	P. 8 line 166: Removed reference to Northwest Power Pool (NWPP) Outage Coordination Processes, dated 01/29/09.	L Beckman

ATCID Revision History			
12.0	03/01/2012	<p>P. 32 Table 2 BPA Flowgates: Added the West of John Day Flowgate and Transmission Line Components.</p> <p>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> <p>P. 4 line 52: Moved MOD 008-01 to the Methodologies Selected section.</p>	L Beckman
14.0	04/11/2012	Appendix A: Updated Portland General Electric's Intertie Agreements to reflect the termination of the AC/DC Exchange Agreement that will be effective on 7/1/2012.	L Beckman
15.0	05/15/2012	<p>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> <p>P. 40 lines 1084-1093: Added generation estimates as the source of the PTDF weightings.</p> <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>	L Beckman L Trolese
16.0	06/27/2012	P. 40 lines 1084-1086: changed sentence to describe that BPA is grouping the generators for all of its adjacent BAAs instead of just a subset.	L Trolese
17.0	08/15/2012	<p>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>	L Beckman

ATCID Revision History			
		<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>	
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 (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>	L Beckman
22.0	01/31/2013	Appendix A: Updated Seattle City Light's PNW AC Intertie Ownership Agreement to reflect shared ownership, effective 1/31/13.	L Wickizer
23.0	01/31/2013	<p>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>	L Wickizer

ATCID Revision History			
		<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>	
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 PTDF description.</p>	L Wickizer
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>	M Olczak

ATCID Revision History			
		Appendix C: Updated the SOL Methodology.	
29.0	05/31/2014	P. 33 Table 2 BPA Flowgates: Added outage conditions flowgate definition for West of McNary.	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. 33 Table 2 BPA Flowgates: Updated West of McNary flowgate definition during outages.	J Ofstead
32.0	10/21/2014	P. 7, lines 106-108: Language clarification on ATC and AFC hourly firm calculations	J Ofstead
33.0	12/05/2014	P. 18, lines 410-417: Language updated to reflect the current practice of setting TTCs in the non-prevailing flow direction on BPA's ATC Paths that use the Rated System Path Methodology.	L. Proctor
34.0	06/01/2015	<p>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>	L. Proctor

ATCID Revision History

		<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 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>	
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ATCID Revision History

		<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 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>	
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ATCID Revision History

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 “inerties, 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 “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>	L. Proctor
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ATCID Revision History

		<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 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>	
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ATCID Revision History

		<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> <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>	
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ATCID Revision History

		<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 “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>	
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ATCID Revision History			
		<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 10TX-15107 from the COI path.</p>	L. Proctor
39.0	12/07/15	<p>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.</p>	L. Proctor

ATCID Revision History			
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 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. 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> <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>	L. Proctor

ATCID Revision History

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 “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>	L. Proctor
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ATCID Revision History			
		<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
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>	A. Heredia

ATCID Revision History			
		<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>	
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 “seasonal” to “seasonal TTC”. Line 332 deleted “always credible”.</p> <p>p. 34, line 999: Removed “June”.</p>	L. Proctor

ATCID Revision History			
		<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, line1179: 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
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 PTFDs at least once per day for hourly ETC calculations</p>	M. Olczak

ATCID Revision History			
		<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>	
52.0	11/01/2019	<p>p.11: deleted the statement related to West of Garrison that read “For all time periods, when there are no studied outages, BPA uses a TTC of 2000 MW E>W and the maximum value from the relevant studies to set the seasonal TTC of the Path W>E.” This statement is no longer applicable as of 8/14/2019. Please see OASIS for TTC values.</p> <p>p.12, lines 333 – 335 and 342, p.13, lines 388-393: changed Peak RC references to RC West</p> <p>p.13, lines 377 – 387: clarification on study process for ATC Paths with Ratings that were established, known and used in operation since January 1, 1994</p> <p>p.15, Calculating Firm Available Transmission Capability section: removed ATC Firm formulas from end of section since the formula is already stated in line 465</p> <p>p.18, Calculating Non-Firm Available Transfer Capability section: removed ATC Non-Firm formulas from end of section since the formula is already stated in line 601</p> <p>p.29, lines 774 – 777: removed references to Peak RC from this section and clarified the modeling data included in the WECC base cases</p>	M. Olczak
53.0	11/13/2019	<p>ATCID has been updated to reflect that BPA will be calculating base ETC for West of Hatwai using flow-based studies. As such, the following changes have been made:</p> <p>p. 7, removed West of Hatwai from Table 1</p> <p>p. 24, added West of Hatwai to Table 2</p> <p>p. 24, added column to Table 2 entitled “Case used for base ETC calculation.” This column identifies whether BPA is using heavy or light load studies to establish base ETC_{F1} for each path.</p>	M. Olczak

ATCID Revision History

		<p>p. 33, line 932: BPA has renamed this section “Determining Base ETC_{Fi} for Heavy Load Base Cases.” All information on light load cases has been removed from the section.</p> <p>p. 35, line 1018: BPA has renamed this section “Sensitivity Studies for Heavy Load Base Cases” to clarify that these sensitivity studies only apply to heavy load cases.</p> <p>p. 37, line 1059: BPA has added a section entitled “Determining Base ETC_{Fi} and Sensitivities for Light Load Base Cases.” This section provides information on the assumptions and sensitivities for BPA’s light load case studies.</p> <p>BPA has removed references to adjustments that BPA had been making for West of Hatwai to hold out NITS capacity for the Western Montana hydro projects; these obligations are now included in BPA’s base ETC_{Fi} studies for West of Hatwai and the adjustments are therefore no longer needed.</p> <p>Maps of BPA paths have been removed from the ATCID.</p> <p>Upon evaluation, BPA has determined that the SADJ/ETC adjustments across the West of Garrison path are no longer appropriate. BPA has removed references to these adjustments throughout the document.</p> <p>p. 36, lines 1052-1053: clarification that the difference between the highest and lowest seasonal base ETC_{Fi} values is used to establish a commercial uncertainty margin.</p>	
54.0	01/28/2020	<p>p.12, line 396: corrected email address</p> <p>p.13, line 399: corrected link</p> <p>p.27, lines 716-717 and lines 720-721: simplified wording</p>	M. Olczak

ATCID Revision History

		<p>p.27 – 28: deleted the following language in the “Use of WECC Base Cases to Determine ETC” section, as the language does not reflect BPA’s current process:</p> <p>“BPA updates the relevant WECC base cases with equipment outages which are known and mapped to the WECC base case, as well as newly-energized generation and Transmission for ATC calculations at least once per day for intra-day, next day and days two through 30.</p> <p>BPA updates the relevant WECC base cases with equipment outages which are known and mapped to the WECC base case, as well as newly-energized generation and Transmission for ATC calculations at least once per month for months two through 13.”</p> <p>p.29: In the “PTDF Analysis and De Minimis” section, deleted the sentence reading “Ten percent is the percentage used to curtail in the Western Interconnection-wide congestion management procedure.” This is a simplification of this section and does not impact the methodology related to this topic.</p> <p>p.32: deleted the following language in the “Determining Base ETCFi for Heavy Load Base Cases” section, as the language does not reflect BPA’s current process:</p> <p>“In ETC Cases, BPA models all of its own NITSFi, GFFi and PTPFi Long-Term Reservations, as well as those of its adjacent TSPs, active at the time the ETC Cases are produced.</p> <p>To model the impact of PTPFi long-term reservations for all of its adjacent TSPs, BPA queries a list of PTPFi long-term reservations from the OASIS of its adjacent TSPs. To model the impact of GFFi and NITSFi long-term obligations for all of BPA’s adjacent TSPs, BPA contacts its adjacent TSPs and requests a list of their GFFi obligations and a list of their NITSFi with a list of designated network resources with the MW amounts designated to serve Network Service and Native Load.</p> <p>BPA models the NITSFi, GFFi and PTPFi Long-Term obligations of all of its adjacent TSPs to the extent that there are sufficient firm Transmission rights on BPA’s or its adjacent TSPs’ Transmission Systems to serve the Load.”</p> <p>p.49, line 1480: corrected link</p>	
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ATCID Revision History			
55.0	03/24/2020	<p>p.27, line 720: added the word “seasonal” to clarify which WECC cases BPA uses for its ETC studies</p> <p>p.27, lines 722-724: clarified which load forecasts BPA is using in its ETC studies</p> <p>p.28: streamlined section with removal of sentence stating “See “Determining Base ETC_{Firm}” section for a description of how BPA develops its ETC Cases”</p> <p>p.32, section titled “Determining Base ETC for Heavy Load Base Cases”: changes throughout the section to reflect BPA’s transition to monthly base ETC studies</p> <p>p.35, lines 1013-1017: removed references to seasonal cases to support BPA’s transition to monthly base ETC studies</p> <p>p.35, lines 1028-1029: changed wording to reflect BPA’s transition to monthly base ETC studies</p> <p>p.35, lines 1030-1033: changes to reflect that BPA uses the highest base ETC to calculate firm ATC and lowest base ETC to calculate non-firm ATC; reference to commercial uncertainty margin removed</p> <p>p.35-36, lines 1034-1039: changes to reflect BPA’s transition to monthly base ETC studies</p> <p>p.36, lines 1041-1047: changes to reflect BPA’s transition to monthly base ETC studies</p> <p>p.37, lines 1060-1064: change to reflect that BPA uses the highest base ETC to calculate firm ATC and lowest base ETC to calculate non-firm ATC; reference to commercial uncertainty margin removed</p> <p>p.38, SADJ/ETC Adjustments section: removed references to SADJs for the commercial uncertainty margin, as this process has been discontinued</p> <p>p.44, SADJ/ETC Adjustment section: removed references to SADJs for the commercial uncertainty margin, as this process has been discontinued and clarified that an SADJ is used to account for BPA’s use of the lowest base ETC in the non-firm ATC calculation.</p>	M. Olczak

ATCID Revision History			
56.0	05/20/2020	<p>p.1, lines 23-26: modified the “Long-Term Reservation” and “Short-Term Reservation” definitions to clarify that all requests (including Network Integration) fall into each definition based on duration</p> <p>p.27, lines 721-728: clarification on load and generation forecasts used in BPA’s ETC cases</p> <p>p. 28, lines 750-751: slight rewording to clarify PTDF calculation process</p> <p>p.29: removed sentence reading “The source used in BPA’s Network Path ATC calculations of transactions for all adjacent TSPs is obtained from the source field if a source is identified, or the POR field if only the POR is identified.” This no longer applies with the elimination of adjacent TSP impact functionality in OATI.</p> <p>p.30: removed sentence reading “The sink used in BPA’s Network Path ATC calculations of transactions for all adjacent TSPs is obtained from the sink field if a sink is identified, or the POD field if only the POD is identified.” This no longer applies with the elimination of adjacent TSP impact functionality in OATI.</p> <p>p.30: removed section on the weighted PTDF for FCRPS generation in the Idaho Power Company BAA. This no longer applies with the elimination of adjacent TSP impact functionality in OATI.</p> <p>p.31, line 855: conformed the formulas/definitions in the “Calculating Firm Existing Transmission Commitments” section to MOD-029 (section referenced MOD-030 formulas/definitions, which BPA no longer uses). References to calculations of adjacent TSP impacts have been deleted, due to elimination of adjacent TSP impact functionality in OATI.</p> <p>p.32, lines 896-897, 905-906, and 911-912: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October.</p> <p>p.35, line 1002: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October</p> <p>p.35-36, Table 3: revised to reflect BPA has transitioned from Summer seasonal ETC study to monthly ETC studies for June through October</p>	M. Olczak

ATCID Revision History

		<p>p.36, lines 1040-1041: removed reference to adjacent TSPs from section. This no longer applies with the elimination of adjacent TSP impact functionality in OATI.</p> <p>p.37, lines 1060-1061: Simplification of LRES and SRES definitions, to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.39, lines 1116-1120: documentation that BPA will use zero as the base ETC when the ETC cases result in a negative base ETC value.</p> <p>p.40, line 1145: conformed the formulas/definitions in the “Calculating Non-Firm Existing Transmission Commitments” section to MOD-029 (section referenced MOD-030 formulas/definitions, which BPA no longer uses). References to calculations of adjacent TSP impacts have been deleted, due to elimination of adjacent TSP impact functionality in OATI.</p> <p>p.42, lines 1221-1222: Simplification of LRES and SRES definitions, to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.43, lines 1262-1265: updated definitions for SCH^+_7 and ASC^+_7 to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.44, lines 1279-1280: updated definition for $RRES_{NF}$ to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.44, lines 1291-1294: updated definitions for $SCH^+_{6,5,4,3,2,1}$ and $ASC^+_{6,5,4,3,2,1}$ to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.45, lines 1322-1324: updated definition for $Counterflows_{NF}$ to account for the elimination of adjacent TSP impact functionality in OATI</p> <p>p.45-46, lines 1325-1331: documentation that BPA will use zero as the base ETC when the ETC cases result in a negative base ETC value.</p> <p>Throughout the document: conformed ETC and AFC formula terms and definitions from MOD-030 to MOD-029 (i.e. PTP_{FI} to PTP_F) and replaced any references to “flowgates” with the term “network paths.”</p>	
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ATCID Revision History			
57.0	09/16/2020	<p>p.2, line 38: added Satsop Injection to the list of ATC Paths for which BPA has a TRM</p> <p>p.7-8, Table 1: Added Satsop Injection to the table of BPA's 1:1 ATC Paths</p> <p>p.7, line 235: clarified that this section applies to BPA's 1:1 ATC Paths. Paths listed in this section will be referenced by BPA as 1:1 ATC Paths going forward. References to these paths have been conformed to this new naming convention throughout the ATCID.</p> <p>p.23, line 708: clarified that this section applies to BPA's Flow-Based ATC Paths. Paths listed in this section will be referenced by BPA as Flow-Based ATC Paths going forward. References to these paths have been conformed to this new naming convention throughout the ATCID.</p>	M. Olczak
58.0	09/30/2020	<p>Throughout document, changed references from MOD-029-1a to MOD-029-2a to match current effective NERC standard.</p> <p>p.27: moved some of the language pertaining to how BPA models generation in its ETC base cases from "Use of WECC Base Cases to Determine ETC" section to p.32, lines 916-917. Language has been modified to better reflect process that BPA uses (process has not changed; this is a documentation change only).</p> <p>p.37, line 1081: language describing the LETC variable has been clarified</p> <p>p.42, line 1240: language describing the LETC variable has been clarified</p>	M. Olczak
59.0	10/21/2020	<p>p.9, line 263: Updated name to match NERC registry</p> <p>p.27, lines 727-735: Added information on loads used in BPA's Winter light load ETC base cases for both BPA's Balancing Authority and outside of BPA's Balancing Authority</p> <p>p.32, lines 905-921: revised to reflect BPA has transitioned from a Winter seasonal ETC study to monthly ETC studies for November through February.</p>	M. Olczak

ATCID Revision History			
		<p>p.35, line 1013-1024: revised to reflect BPA has transitioned from a Winter seasonal ETC study to monthly ETC studies for November through February.</p> <p>p.36, "Determining Base ETC and Sensitivities for Light Load Base Cases" section: removed outdated verbiage regarding the balancing of the case.</p>	

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