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TESTIMONY of
PAUL A. BRODIE, RAYMOND D. BLIVEN, and WILLIAM J. DOUBLEDAY
Witnesses for Bonneville Power Administration

**SUBJECT: FY 2010-11 COST OF SERVICE ANALYSIS AND RATE DESIGN
CHANGES AND ADJUSTMENTS**

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7 **Section 1: Introduction and Purpose of Testimony**

8 *Q. Please state your names and qualifications.*

9 A. My name is Paul A. Brodie, and my qualifications are contained in WP-10-Q-BPA-09.

10 A. My name is Raymond D. Bliven, and my qualifications are contained in
11 WP-10-Q-BPA-06.

12 A. My name is William J. Doubleday, and my qualifications are contained in
13 WP-10-Q-BPA-14.

14 *Q. Please describe the purpose of your testimony.*

15 A. The purpose of our testimony is to sponsor the Wholesale Power Rate Development
16 Study (WPRDS or Study), WP-10-E-BPA-05, section 3, and the WPRDS Documentation
17 (Documentation), WP-10-E-BPA-05A, section 2. This testimony addresses the Cost of
18 Service Analysis (COSA), rate design adjustments, and the modeling of BPA's rate
19 development. Rate design issues are discussed in the testimony of Fisher et al., WP-10-
20 E-BPA-30. Slice revenue requirement and rate are discussed in the testimony of Lee et
21 al., WP-10-E-BPA-21. The section 7(b)(2) rate test is discussed in the testimony of
22 Doubleday et al., WP-10-E-BPA-15.

23 *Q. How is your testimony organized?*

24 A. Our testimony is organized in six sections. Section 1 states the purpose of our testimony.
25 Section 2 describes the COSA used in BPA's ratemaking. Section 3 describes changes to

1 rate design and ratemaking adjustments, with subsections on: a) modeling the Low
2 Density Discount (LDD); b) modeling the Conservation Rate Credit (CRC); and
3 c) modeling rate mitigation for customers with seasonal loads. Section 4 describes the
4 modeling of the rate development process, with subsections on: a) modeling the Rate
5 Design step; b) modeling the Slice Separation step; and c) modeling the Slice product
6 cost. Section 5 describes changes in the rate analysis model (RAM2010) along with
7 pending modeling changes. Section 6 reports the projected rates and REP benefits.
8

9 **Section 2: Cost of Service Analysis (COSA)**

10 *Q. What is the purpose of the COSA section in the RAM?*

11 A. The COSA allocates the rate period generation revenue requirements that are determined
12 in the Revenue Requirement Study, WP-10-E-BPA-02, to BPA's customer classes. The
13 COSA allocates the rate period generation revenue requirements among rate pools based
14 on statutory directives and the principle of cost causation. The relative use of resources,
15 services, or facilities among rate pools is identified, and costs generally are allocated to
16 rate pools in proportion to each class's use. Cost allocation is based on the priorities of
17 service from resource pools to rate pools provided in section 7 of the Northwest Power
18 Act.

19 *Q. How is the generation revenue requirement assigned to resource pools in the COSA?*

20 A. Consistent with past practice, costs are assigned to the resource pools primarily by direct
21 identification and consistent with the rate development requirements of the Northwest
22 Power Act. Exceptions are net interest expenses and net revenues, which include
23 Minimum Required Net Revenues (MRNR) and Planned Net Revenues for Risk (PNRR).
24 A modification to the procedure for assigning these two components to the resource pools
25 is described in the testimony of Lennox et al., WP-10-E-BPA-12, section 3.

1 Q. *In this Initial Proposal, the COSA allocates resource pool costs to rate pools for the FY*
2 *2010-2011 rate period. Are other COSA allocations performed as part of BPA's*
3 *ratemaking process?*

4 A. Yes. Costs not associated with the resource pools are allocated pursuant to section 7(g)
5 of the Northwest Power Act. Revenue credits are identified in the COSA and assigned to
6 resource pools. BPA's ratemaking process includes conducting the section 7(b)(2) rate
7 test, which covers the rate period (FY 2010-2011) and the ensuing four years (FY 2012-
8 2015). The COSA allocates generation revenue requirements to rate pools for each of the
9 six years in the 7(b)(2) rate test period (FY 2010-2015). The Program and 7(b)(2) Cases
10 are explained in the Section 7(b)(2) Rate Test Study, WP-10-E-BPA-06, and testimony of
11 Doubleday et al., WP-10-E-BPA-15.

12 Q. *Please explain the net revenues that are added to the generation revenue requirement.*

13 A. For the rate period, the COSA adds 118 million for FY 2010 and \$4 million for FY 2011
14 of MRNR to the revenue requirement. The additional funds are required to make up the
15 difference between (1) non-cash expenses included in revenue requirements and (2) the
16 cash requirements for amortization of bonds and appropriations and irrigation assistance
17 in FY 2010 and FY 2011. Additionally, MRNR is included in the generation revenue
18 requirements for the subsequent four years for use in the 7(b)(2) rate test.

19 Documentation, WP-10-E-BPA-05A, section 2, Table COSA 06.

20 In addition, PNRR is added as a risk mitigation tool to allow rates to be set at a
21 level that produces a 95 percent Treasury Payment Probability (TPP). *See Risk Analysis*
22 *and Mitigation Study, WP-10-E-BPA-04, section 2.1; and Rodehorst et al., WP-10-E-*
23 *BPA-14. The PNRR value used in the COSA 06 tables is the result of an iterative*
24 *process among the RAM2010, the RiskMod model, and the ToolKit model (including the*
25 *NORM model). The iteration is initiated with a seed value for PNRR in the COSA 06*

1 tables of the RAM2010. The resultant rates and revenue requirement data are used in
2 RiskMod to produce revenue distributions for 3,500 games (scenarios based on the
3 introduction of varying risk factors). These revenue distributions are then used in the
4 ToolKit to find a combination of risk mitigation tools that results in a 95 percent TPP.
5 ToolKit produces a new PNRR value and annual ending cash reserve amounts (which
6 affect BPA's interest credit) for new COSA 06 tables. The iterative process is continued
7 until the difference between the new PNRR value and the previously calculated value is
8 zero (rounding PNRR to the nearest \$1 million per year greatly reduces the number of
9 iterations). The iterative process produced a PNRR value of \$48 million per year.

10 *Q. During the iterative process described above, which rates from RAM2010 are used in the*
11 *RiskMod?*

12 *A.* RAM2010 produces rates in its Rate Design step and its Slice Product Separation step,
13 and those rates are used in the RiskMod. These two major rate calculation steps are more
14 fully discussed in section 4 of this testimony. The PNRR iterative process uses the final
15 non-Slice product rates produced by the last of the major ratemaking steps, the Slice
16 Product Separation step.

17 *Q. Why is it appropriate to use the Slice Product Separation step rates as the basis for*
18 *determining the PNRR level?*

19 *A.* In the Rate Design step, the PF Preference rate pool includes the loads of all
20 PF Preference products. The Slice Product Separation step separates the Slice product
21 firm loads, revenue credits, and allocated costs from the non-Slice product PF Preference
22 loads, revenue credits, and costs. Rate design and RiskMod recognize the design of BPA
23 products; Slice does not include any PNRR because the Slice purchasers directly assume
24 the risks mitigated by PNRR. The PNRR added to the revenue requirement is paid by the
25 non-Slice rates. RiskMod assesses BPA's risk related to or assigned to non-Slice

1 products. Therefore, the non-Slice PF Preference rate calculated in the Slice Product
2 Separation step is the appropriate PF rate to use in the risk iteration process that
3 determines the level of PNRR.
4

5 **Section 3: Rate Design Changes and Adjustments**

6 **Section 3.1: Modeling the Low Density Discount (LDD)**

7 *Q. Has the modeling of the LDD changed in RAM2010 for the Initial Proposal from that*
8 *used during WP-07 Supplemental proceeding?*

9 A. No. The Initial Proposal uses the same modeling used in the WP-07 Supplemental
10 proceeding. In the Revenue Forecast Application, the LDD, to the extent appropriate, is
11 applied to the rates for eligible purchasers to calculate the revenue reduction resulting
12 from the LDD. The rate discounts provided by the LDD are limited to the PF Preference
13 rate class. In RAM2010, the revenue reduction associated with the LDD is allocated as a
14 cost to the PF rate pool in the initial cost allocation step at the beginning of the Rate
15 Design step. For more information on the LDD, *see* WPRDS, WP-10-E-BPA-05,
16 section 2.10 and the testimony of Fisher et al., WP-10-E-BPA-30.
17

18 **Section 3.2: Modeling Conservation Rate Credit Costs**

19 *Q. Has the modeling of Conservation Rate Credit (CRC) costs in RAM2010 changed for the*
20 *Initial Proposal compared to the WP-07 Supplemental proceeding?*

21 A. No. The Initial Proposal uses the same modeling used in the WP-07 Supplemental
22 proceeding. In RAM2010, the costs associated with the CRC are included in the
23 generation revenue requirement and enter the ratemaking process by inclusion within the
24 conservation line of each year's COSA Table. *See* WPRDS Documentation,

1 WP-10-E-BPA-5A, COSA 06 tables. For more information on the CRC, *see* WPRDS,
2 WP-10-E-BPA-5, section 2.11, and Ingram et al., WP-10-E-BPA-17.

3
4 **Section 3.3: Modeling Rate Mitigation for Customers with Irrigation Loads**

5 *Q. Is irrigation rate mitigation modeled the same in RAM2010 for the Initial Proposal as it*
6 *was during WP-07 Supplemental proceeding?*

7 *A. Yes. Rate mitigation is targeted to PF Preference rate class customers with heavy*
8 *summer seasonal irrigation loads that face adverse rate impacts from the seasonal aspects*
9 *of rate design. The costs and the benefits associated with this rate mitigation are limited*
10 *to the PF Preference class. In RAM2010, the costs associated with irrigation rate*
11 *mitigation are allocated to the PF rate pool at the beginning of the Rate Design step. For*
12 *more information on seasonal irrigation rate mitigation, see WPRDS, WP-10-E-BPA-5,*
13 *section 2.9, and Fisher et al., WP-10-E-BPA-30.*

14
15 **Section 4: Rate Development Modeling**

16 **Section 4.1: RAM2010**

17 *Q. Please briefly describe RAM2010.*

18 *A. RAM2010 is a large Excel spreadsheet model that is automated with Visual Basic*
19 *macros. RAM2010 is operated through a pop-up menu and explicitly shows the rate*
20 *results after each major ratemaking step. RAM2010 automatically determines which of*
21 *the potential participating Residential Exchange Program (REP) utilities would be*
22 *eligible to exchange as the unbifurcated PF and PF Exchange rates are developed.*
23 *RAM2010 calculates the PF Slice product cost for each year and incorporates those data*
24 *in the calculation of the rate period non-Slice PF Preference rate.*

1 Q. *How is RAM2010 organized?*

2 A. RAM2010 has three main steps: a Cost of Service Analysis (COSA) step, a Rate Design
3 step, and a Slice Separation step.

4 Q. *Please provide a brief description of the RAM2010 COSA step and Rate Design step.*

5 A. The RAM2010 COSA step follows BPA's rate directives by determining the costs and
6 credits associated with the three resource pools (FBS resources, Exchange resources, and
7 new resources) available to serve loads and then allocating the resource costs to two rate
8 pools, 7(b) (PF loads) and 7(c) (IP loads) plus 7(f) (NR and firm FPS loads). In addition,
9 costs and credits not associated with the resource pools are allocated pursuant to
10 section 7(g). After this initial allocation of costs, the Northwest Power Act requires that
11 some rate adjustments be made, such as those described in section 7(b) and section 7(c)
12 of the Act. These adjustments are made to ensure that the cost relationship between the
13 different posted rates – PF Preference, PF Exchange, IP (Industrial Firm Power), and NR
14 – comport with the BPA's rate directives. RAM2010 performs these rate adjustments,
15 including the 7(b)(2) rate test and two separate 7(c)(2) IP-PF link adjustments in its Rate
16 Design step. The Rate Design step within RAM2010 concludes with the calculation of
17 the Rate Design step rates. The calculation of the PF Exchange and the NR rates is
18 complete at this point in the rate modeling.

19 Q. *Please provide a brief description of the Slice Separation step.*

20 A. After the Rate Design step, costs are allocated to the various rate pools, including the
21 PF Preference rate pool, which contains all firm PF Preference load. The Slice
22 Separation step separates out the PF Slice product revenues, revenue credits, and firm
23 loads from the overall PF Preference rate pool, leaving the costs that must be recovered
24 by the remaining non-Slice product PF Preference load through the PF Preference energy,
25 demand, and load variance rates. *See* Documentation, WP-10-E-BPA-05A, Table 2.6.1,

1 SLICESEP 01. After the Slice Separation step, the PF Preference rate level may have
2 changed, necessitating a third 7(c)(2) IP-PF link adjustment. This rate adjustment sets
3 the final IP rate equal to the non-Slice PF rate at the DSI load factor, plus the net
4 industrial margin, plus any 7(b)(3) Supplemental Rate Charge. Documentation,
5 WP-10-E-BPA-05A, Table 2.6.2, SLICESEP 02.

6 7 **Section 4.2 Modeling the Slice Product**

8 *Q. How is the Slice product modeled in RAM2010?*

9 A. RAM2010 includes a Slice Cost worksheet that estimates the cost per month of a
10 1-percent Slice of the BPA system. This worksheet lists the components of the Slice
11 revenue requirement, including the net cost of system augmentation and excluding the
12 cost of balancing power purchases and PNRR. The cost per month is the Slice rate and is
13 subject to the Slice True-Up Adjustment Charge. WPRDS, WP-10-E-BPA-05,
14 section 2.15.

15 16 **Section 5: Changes in the Rate Analysis Model**

17 **Section 5.1: Principal Modeling Changes**

18 *Q. What changes were made to the WP-07 Supplemental RAM2007 in developing*
19 *RAM2010?*

20 A. There are five principal changes to the RAM2007 model. The first three affect only the
21 7(b)(2) rate test and are addressed in Doubleday et al., WP-10-E-BPA-15.

22 (1) The composition of the 7(b)(2)(D) resource stack in the 7(b)(2) Case portion of
23 RAM2010 was changed.

24 (2) The resources in the 7(b)(2)(D) resource stack are now based in real FY 2010
25 dollars.

1 (3) The “starting” resource cost values for FY 2010 for non-conservation resources in
2 the 7(b)(2)(D) resource stack were adjusted so that the average cost of the
3 resource for the entire 6-year rate test period (FY 2010-2015) in the 7(b)(2) Case
4 is equivalent to the average cost for the resource in the Program Case.

5 (4) Changes were made to the treatment of BPA’s service to Port Townsend Paper,
6 which were converted from an FPS sale to an IP sale, and service to aluminum
7 DSIs was changed from a monetized power sale to an assumed sale of physical
8 power at the IP rate.

9 (5) Changes were made to the calculation of the individual 7(b)(3) Supplemental Rate
10 Charges applied to the individual PF Exchange rates.

11 *Q. How did you change the treatment of BPA service to Port Townsend Paper?*

12 A. For ratemaking purposes, service to Port Townsend Paper had been included as an FPS
13 contract that did not exist at the time the Northwest Power Act was enacted. As such, the
14 sale was included in the load obligations, but not as a sale at the IP rate. In this Initial
15 Proposal, service to Port Townsend Paper has been defined as a sale under the IP rate
16 schedule. This change in status from FPS sale to IP sale does not affect the load resource
17 balance.

18 *Q. How did you change the treatment of BPA service to aluminum DSIs?*

19 A. For ratemaking purposes, service to aluminum DSIs had been included as a monetized
20 power sale. The expected costs of the monetized power sale, \$59 million per year, were
21 included in the generation revenue requirement. In the Initial Proposal, we assume that
22 service to the aluminum DSIs is a physical sale under the IP rate schedule. This change
23 in status from a monetized power sale to IP sale affects the load resource balance,
24 creating the need for more system augmentation. Therefore, system augmentation and its
25 cost are increased above that included in the revenue requirement.

1 Q. *What do you assume for service to aluminum DSIs?*

2 A. For ratemaking purposes, we assume the power sale to aluminum DSIs is sized such that
3 net cost (additional system augmentation costs minus revenue at the IP rate) is
4 \$59 million per year. In the Initial Proposal, we assume a 385 aMW power sale to the
5 aluminum DSIs. This net amount is calculated through an iterative process with
6 RAM2010, depending on the level of the IP rate, and then included in the generation
7 revenue requirement. As a result of this process, there is no additional rate impact to
8 power rates compared to the inclusion of the monetized power sale.

9 Q. *What change was made to the calculation of the individual 7(b)(3) Supplemental Rate
10 Charges applied to the base PF Exchange rate?*

11 A. RAM2010 was updated to reflect the implementation of the 7(b)(3) Supplemental Rate
12 Charges as established in the WP-07 Supplemental proceeding. This change is necessary
13 because the 2-year implementation of the Charges is slightly different than the one-year
14 implementation under WP-07 rates. The change in the calculation reflects using the
15 2-year total exchange load for calculation of the individual FY 2010 and FY 2011 7(b)(3)
16 Supplemental Rate Charges.

17 Q. *In developing RAM2010, have other minor changes been made to the RAM2007 used in
18 the WP-07 Supplemental Proposal?*

19 A. Yes. Some modeling changes have been made to produce the most current version of
20 RAM2010. These changes were made to either correct slight errors in the calculations or
21 to make the calculations more transparent. These changes are relatively minor.

22

1 **Section 5.2: Pending Modeling Changes**

2 *Q. Have you discovered any modeling problems that were not corrected before the Initial*
3 *Proposal rates were established?*

4 A. Yes. There are two small discrepancies in the rate modeling in the RAM2010. First, the
5 marginal cost shape of the energy and the demand charges for the rates is unchanged in
6 RAM2010 from the WP-07 Supplemental rate proceeding. A different marginal cost
7 shape, however, is shown in the WPRDS, WP-10-E-BPA-05, chapter 2. The marginal
8 cost shape for the PF rate should have been changed to the actual shape of the PF-07R
9 rates. Instead, RAM2010 continues to use the marginal cost shape established in the
10 WP-07 Final Proposal. The effect of this pending update will be that the PF-10 rates will
11 be slightly different due to rounding differences. Also, the marginal cost shape for the IP
12 and NR rates was not updated to the new marginal cost prices developed by the Market
13 Forecast Study, WP-10-E-BPA-03. The effect of this pending update will not change the
14 average annual levels of the IP and NR rates, but the monthly diurnal rates will change.

15 Second, the flat load shape assumed for the IP and NR loads was not updated for
16 the actual monthly HLH and LLH hours in the FY 2010-2015 time period. As with the
17 prior pending updates, this one will also not change the average annual levels of the IP
18 and NR rates, but the monthly diurnal rates will change.

19
20 **Section 6: FY 2010-2011 Results: Projected Rates and Net Cost of the Rep**

21 *Q. Please describe the results of the calculation of the Initial Proposal rates.*

22 A. The rate modeling described above results in an average PF Preference rate of
23 29.43 mills/kWh; a load-weighted average PF Exchange rate of 49.44 mills/kWh; and a
24 7(b)(2) rate test trigger of 8.07 mills/kWh for FY 2009. The load-weighted PF Exchange
25 rate is not used in the actual calculation of REP benefits but is reported for informational

1 purposes. Individual annual utility-specific PF Exchange rates are calculated in
2 RAM2010 and are then applied to the forecast IOU and COU ASCs and exchange loads
3 for FY 2010-2011 to produce IOU and COU 2-year total REP benefits of about
4 \$528 million for FY 2010-2011 (before adjustments to apply a portion of these REP
5 benefits to the Lookback Amount). The average IP rate is 36.37 mills/kWh, including the
6 7(b)(3) Supplemental Rate Charge. The average NR rate is 69.72 mills/kWh, including
7 the 7(b)(3) Supplemental Rate Charge. Documentation, WP-07-E-BPA-05A, Table 2.9.

8 *Q. Does this conclude your testimony?*

9 *A. Yes.*

10