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TESTIMONY OF
STEVEN R. BELLCOFF, GLEN S. BOOTH, MILDRED A. CHENNELL,
MARGARET C. RACHT, AND JASON C. SWEET
Witnesses for Bonneville Power Administration

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5
6 **SUBJECT: LOADS AND RESOURCES**

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

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

9 A. My name is Steven R. Bellcoff, and my qualifications are contained in BP-20-Q-BPA-01.

10 A. My name is Glen S. Booth, and my qualifications are contained in BP-20-Q-BPA-02.

11 A. My name is Mildrid A. Chennell, and my qualifications are contained in BP-20-Q-
12 BPA-04.

13 A. My name is Margaret C. Racht, and my qualifications are contained in BP-20-Q-BPA-33.

14 A. My name is Jason C. Sweet, and my qualifications are contained in BP-20-Q-BPA-37.

15 *Q. Please state the purpose of your testimony.*

16 A. The purpose of this testimony is to sponsor the Power Loads and Resources Study
17 (Study), BP-20-E-BPA-03, and the Power Loads and Resources Study Documentation
18 (Documentation), BP-20-E-BPA-03A.

19
20 **Section 2: Load Obligation Forecasts**

21 *Q. Is the BP-20 load forecasting process different from what was used in the BP-18 rate*
22 *case?*

23 A. For the most part, we used the same least-squares regression-based models to forecast
24 customer loads. However, we have adopted a different process—statistically adjusted

1 end-use models—for a limited number of customers. This is addressed in Section 2.2.1
2 of the Study.

3 *Q. Are BPA's customers involved in the load forecasting process?*

4 A. Yes. A BPA analyst contacts each customer to learn about potential new load additions
5 or load loss in the customer's service territory. The customer reviews the growth rate that
6 the analyst has developed and discusses new facilities that are being planned in the
7 customer's service territory. If the growth rate of the analyst's forecast does not reflect
8 the new load additions or load loss, the analyst will add the new facility or subtract the
9 load loss. The analyst then reviews the forecast considering all of the information
10 obtained from the customer and adjusts the forecast if necessary. This is addressed in
11 Section 2.2.1 of the Study.

12 *Q. What historical time period was used in the load obligation forecast models?*

13 A. The time period for the historical series of data on which BPA's load obligation forecasts
14 are based varies by customer. In general, BPA used historical data for FY 2003 through
15 2017, when possible, for Total Retail Load and Power Sales Contract obligation
16 forecasts. However, if distinct changes in a customer's historical load obligations
17 occurred, changes in the length of the historical data sets were incorporated to reflect the
18 current conditions in the customer forecast.

19 *Q. Why would the historical time period used in the load obligation forecast models vary
20 between customers?*

21 A. For some customers, the historical data reflect long-term or near-term changes that could
22 possibly skew load growth trends. For example, BPA's customers may have consumer
23 loads that are large relative to their system that started or ended during the historical data
24 period. In such instances, the historical data provided to the load obligation forecast

1 models would take into account only the most recent stable data, reflecting the current
2 situation.

3 *Q. Do you adjust the historical data the load forecast is based on for weather?*

4 A. No. However, temperature variables are incorporated in the regression models to account
5 for the impact of weather on load. While there is not a separate weather normalization
6 process, this methodology captures the effects of weather. The models use monthly
7 temperatures that have been averaged over the years 1970–2004 to estimate the expected
8 temperature for this Study. Temperature is the only weather variable used in the
9 modeling process. The monthly averaged temperature reflects the effects of other
10 variables and captures the effects of most weather conditions on loads.

11 *Q. Are customer-reported conservation amounts included in the Study?*

12 A. Yes. Each customer's load obligation forecast accounts for the reported amount of
13 conservation that the customer plans to achieve during the FY 2020–2021 rate period.
14 This is addressed in Section 2.2.4 of the Study.

15 *Q. Does the Study forecast any BPA-funded conservation beyond what customers have
16 reported they plan to achieve?*

17 A. No. The load obligation forecast does not include additional BPA-funded conservation
18 beyond what the customers have reported they plan to achieve. If individual customers
19 implement greater conservation measures than what they committed to, those customers
20 will see lower power bills reflecting reduced power purchases from BPA due to those
21 additional conservation measures. This is addressed in Section 2.2.4 of the Study.

1 *Q. Please summarize the year-to-year (FY 2020 to FY 2021) load growth estimates for the*
2 *Study.*

3 A. For FY 2020 to FY 2021, BPA's total firm load obligations are projected to grow at an
4 average annual rate of approximately 0.2 percent (14 aMW). The year-to-year load
5 growth estimates from FY 2020 to FY 2021 for each customer class and contract type are
6 shown in Table 1. Specific loads are shown in Study Table 3 and Documentation
7 Tables 1.2.1, 1.2.2, 1.2.3, 9.1.1, 9.1.2, and 9.1.3.

8 *Q. Does BPA have any long-term sales contracts that have ended or expired since the BP-18*
9 *Final Proposal?*

10 A. Yes. Several BPA contracts have expired or will expire between the BP-18 Final
11 Proposal and the end of FY 2019 and therefore are not included in the Study. These
12 contracts include:

- 13 • BPA and Avista Corporation's WNP-3 Settlement contract, which expires June 30,
14 2019, decreasing average annual load obligations by 46.4 aMW from the BP-18 Final
15 Proposal.
- 16 • BPA and PG&E's Klondike III Wind Shaping contract, which expires February 14,
17 2019, decreasing average annual load obligations by 17 aMW from the BP-18 Final
18 Proposal.
- 19 • BPA and Alcoa Inc.'s (Alcoa) current contract, which runs through September 30,
20 2022; however, Alcoa has exercised an option to terminate the contract with one
21 year's notice, effective August 31, 2019. Consequently, there will be zero Alcoa load
22 served by BPA under this contract during the FY 2020–2021 rate period, decreasing
23 average annual load obligations by 62 aMW from the BP-18 Final Proposal.

1 Q. How do BPA's load obligation forecasts in the Study compare with those forecast for
2 FY 2018–2019?

3 A. BPA's two-year average load obligation forecast for FY 2020–2021 is 3.5 percent
4 (262 aMW) lower than the two-year average forecast published for FY 2018–2019 in the
5 BP-18 Final Proposal. Differences between BPA's total two-year average load obligation
6 forecasts for customer classes in the Study and those in the BP-18 Final Proposal are as
7 shown in Table 2.

8 Q. Did BPA's load obligation forecasts include any adjustments?

9 A. Yes. BPA and Cowlitz PUD have agreed to allow Cowlitz PUD to assume a lower load
10 forecast for its NORPAC load than BPA expects will actually occur. The BPA load
11 forecast in the Initial Proposal assumes a NORPAC load of 80 aMW; however, BPA
12 expects a load of 150 aMW for the facility. If the facility operates at a higher level than
13 80 aMW, the customer is obligated to compensate BPA. This is addressed in the Power
14 Rates Study Testimony (Stiffler *et al.*), BP-20-E-BPA-15, Section 3.3, Liquidated
15 Damages Revenue Credit.

16 Q. How do customer load changes affect BPA's Tier 1 obligations?

17 A. The load forecasts incorporate a variety of parameters based on changes in actual
18 conditions, including load growth, load reductions, and local economics. Across BPA's
19 service territories some customers have experienced load growth while other customers
20 have had load losses, including some from the industrial sector. The impact on BPA's
21 Tier 1 load obligations depends on the customer.

22 BPA's Tier 1 load obligations are reduced when: (1) customers whose loads are
23 already below their Rate Period High Water Mark (RHWM) decrease, or (2) customers
24 whose loads are greater than their RHWM experience load decreases large enough to
25 reduce their load obligations below their RHWM. BPA's Tier 1 obligations increase

1 when customers whose loads are below their RHWL experience load growth; however,
2 BPA's increase is limited to the load growth up to those customers' RHWLs. For those
3 customers, load growth larger than their RHWL is Above-RHWL load and is served as
4 elected by the customer, under terms of the TRM. This is explained in Section 2.2 of the
5 Study and Section 4.3 of the TRM.

6 Above-RHWL load placed on BPA is served through surplus power and/or the
7 purchase of power to meet those customer-elected Above-RHWL (Tier 2) loads. Power
8 purchased or acquired by BPA to serve Tier 2 load is separate and distinct from BPA's
9 Tier 1 System Capability. Therefore, customers' Above-RHWL load service elections
10 are not included in loads and resources studies and do not affect BPA's annual firm
11 energy load-resource balance.

12 In summary, individual customer load growth increases BPA's Tier 1 obligations
13 only up to the individual customer's RHWL. Individual customer load losses reduce
14 BPA's Tier 1 load obligations only after dropping below the individual customer's
15 RHWL.

16 *Q. Does the Study incorporate the purchase obligation changes for Okanogan PUD that will*
17 *be effective in October 2019?*

18 *A.* Yes. The Study reflects Okanogan PUD's product change from Slice to Block-only
19 service effective October 1, 2019.

20 *Q. Will the sum of the customers' Slice percentages used in the Initial Proposal Study*
21 *change for the Final Proposal?*

22 *A.* We do not anticipate any changes to the Slice percentages in the Final Proposal. The sum
23 of all Slice percentages used in the Study is 22.36267 percent, and in the Final Proposal
24 the sum of all Slice percentages will not exceed that amount. This is addressed in
25 Section 3.4 of the Study. However, the sum of all Slice percentages may be less than

22.36267 percent if a customer's net requirement forecast is less than its forecast Critical Slice Amount as defined in the CHWM Contract. In such a case, the customer's Slice percentage would be scaled down until its forecast Critical Slice Amount was equal to the customer's annual net requirement forecast.

Q. Will customers' load obligation forecasts and Federal contract sales forecasts be updated for the BP-20 Final Proposal?

A. Yes. The load obligation forecasts will be updated for customers in the spring of 2019 for the BP-20 Final Proposal. In addition, any revisions to forecast Federal contracts will be included in the BP-20 Final Proposal.

Section 3: Resource Forecasts

Q. Does the Columbia Generating Station (CGS) generation forecast reflect improvements in terms of increased generation or capacity since the BP-18 Final Proposal?

A. Yes. Since the BP-18 Final Proposal, the generation forecast for CGS has been updated to incorporate facility improvements, specifically those related to the Measurement Uncertainty Recapture (MUR) project, which increases the forecast CGS annual generation by 16 aMW. Additionally, Energy Northwest has reduced the length of the CGS refueling/maintenance outages that occur in alternating years ("maintenance years"), which increases the project's annual generation by 41 aMW in the maintenance years. These updates result in a forecast generation of 1,116 aMW in non-maintenance years and 994 aMW in maintenance years. This is shown in Documentation Tables 4.1.1, 4.1.2, and 4.1.3, Line 1. BPA will continue to monitor CGS's actual operational performance and may update forecast generation estimates in the Final Proposal if justified.

1 *Q. Are there any resources from which BPA acquires generating output whose purchase*
2 *contracts will end or expire before the FY 2020–21 rate period begins?*

3 A. Yes. BPA’s contract for the acquisition of generation from the Foote Creek 4 wind
4 project expires on September 30, 2020. This expiration resulted in two changes to the
5 Study. First, it reduced BPA’s firm resources forecast by about 4 aMW in FY 2021, the
6 forecast generation from the Foote Creek 4 project. This reduced BPA’s two-year
7 average Tier 1 System, as defined by the TRM, by 2 aMW. Second, it reduced the
8 anticipated annual 80-water-year average generation by 4 aMW in FY 2021, thereby
9 reducing the amount of secondary energy provided to the Power and Transmission Risk
10 Study. Additionally, the potential early termination of the Foote Creek 1 contract would
11 cause similar changes; this is addressed in Fredrickson *et al.*, BP-20-E-BPA-19,
12 Section 4.

13
14 **Section 4: Hydro Regulation Studies**

15 *Q. Are the spill assumptions for fish passage different from those used in the BP-18 Final*
16 *Proposal?*

17 A. Yes. The spill assumptions used in BP-18 were consistent with the 2014 FCRPS
18 Biological Opinion (BiOp) and included early August spill curtailment at the four lower
19 Snake River projects. The BP-20 Initial Proposal spill assumptions for the spring spill
20 period are based on the actual operations implemented in 2018, which involved spilling
21 to applicable water quality standards for total dissolved gas (TDG), or “gas cap” spill.
22 Summer spill assumptions are informed by the results of biological performances
23 standard testing conducted over the last decade to measure dam passage survival for out-
24 migrating juvenile fish. Summer spill assumptions do not include early August spill
25 curtailment. This is addressed in Section 3.1.2.1.1 of the Study.

1 Q. *Did updating the spill assumptions have any effect on the hydro regulation studies?*

2 A. Yes. The updated spill assumptions resulted in more spill at Federal hydro projects,
3 which reduced Federal system hydro generation.

4 Q. *Will there be changes in the hydro regulation studies or the spill assumptions for the*
5 *BP-20 Final Proposal?*

6 A. There will be changes to the hydro regulation studies, but there are no proposed changes
7 to the spill assumptions. For the BP-20 Final Proposal, we will incorporate updated
8 estimates of residual hydro load and other power and non-power requirements available
9 at that time. The spill assumption is proposed to stay at the level used in this Initial
10 Proposal because it is the latest available information. This is explained in Fredrickson
11 *et al.*, BP-20-E-BPA-19.

12 Q. *Are any other updates to the spill assumptions for fish passage different from those used*
13 *in the BP-18 Final Proposal?*

14 A. Yes. BPA has updated the spill production estimates, which are the spill volumes that are
15 estimated to produce a certain level of TDG. In early 2018, the U.S. Army Corps of
16 Engineers (Corps) created updated spill production estimate tables for use in the
17 Columbia River System Operations Environmental Impact Statement (CRSO EIS), which
18 is under development in accordance with the National Environmental Policy Act
19 (NEPA). These values were informed by output from a Corps model that had only
20 recently been developed for the purposes of informing multiyear planning studies. The
21 initial output from this model produced results that did not fully reflect observed data.
22 For use in this ratemaking process, BPA examined these new modeled spill production
23 estimates and adjusted them slightly using comparisons to observed spill data. BPA
24 plans to use these updated spill production estimates in all internal BPA studies going

forward, subject to further refinement based on lessons learned implementing complex gas cap spill operations.

Q. Are the spill assumptions for fish passage different from what was used in the BP-20 Rate Period High Water Mark (RHWM) Process? If so, how?

A. Yes. The BP-20 Rate Period High Water Mark studies assumed a block design spill operation, which involved two blocks: a four-week “gas cap spill block” operation (spill up to current applicable water quality standards for TDG), and a “performance standard spill block” operation for the remainder of the spring fish passage season (spill informed by biological performance standard testing conducted over the last decade). Additionally, the RWHM studies included an August Spill curtailment operation at the Lower Snake River projects. As noted above, the BP-20 Initial Proposal spill assumptions for the spring spill period are based on the spill plan implemented in 2018, which included spill to applicable regulatory limits for TDG. The BP-20 Initial Proposal spill assumptions for the summer spill period are informed by the results of biological performances standard testing, conducted over the last decade, to measure dam passage survival for out-migrating juvenile fish, without August spill curtailment. The basis for the BP-20 proposal for modeling spill operations is addressed in Fredrickson *et al.*, BP-20-E-BPA-19, Section 5.

Section 5: Load-Resource Balance

Q. What process is used to produce the load-resource balance for the Study?

A. BPA compiles forecasts of load obligations, contract sales and purchases, and generating resources, which are obtained through direct utility data submittals and internal BPA forecasting models. The load-resource balance is estimated for several types of power measurements and time frames. These measurements and time frames include (1) annual

1 energy in aMW, (2) monthly energy in aMW, (3) monthly heavy load hour (HLH) MWh,
2 and (4) monthly light load hour (LLH) MWh. This is addressed in Section 1.2 of the
3 Study.

4 The annual energy analysis focuses on BPA's firm annual energy load-resource
5 balance under critical water conditions, averaged over each fiscal year of the rate period.
6 Depending on BPA's load-resource balance condition, contract sales or purchase
7 adjustments are made to BPA's loads or resources so that the sum of BPA's firm load
8 obligations equals the sum of its firm resources. This is addressed in Section 4.1 of the
9 Study.

10 The monthly load-resource analysis in the Study presents BPA's firm monthly
11 energy load-resource balance. The monthly load-resource balance includes any annual
12 firm surplus power sales or system augmentation calculated for BPA's annual firm
13 energy load-resource balance. The resulting monthly load-resource balance is detailed in
14 Documentation Tables 9.1.1, 9.1.2, and 9.1.3.

15 *Q. How do you treat annual system augmentation purchase estimates in the Study?*

16 *A.* If BPA's annual firm energy resource forecast is less than its load obligations, BPA will
17 calculate the amount of annual power purchases or resource acquisitions needed for the
18 Federal system to achieve annual firm energy load-resource balance. This purchase or
19 resource acquisition estimate is called "system augmentation." In both FY 2020 and
20 FY 2021, the Federal system is forecast to be annual firm energy surplus; therefore, no
21 system augmentation is needed. However, if either year were forecast to be annual firm
22 energy deficit assuming 1937 critical water conditions, system augmentation purchases
23 would be needed to maintain annual load-resource balance. If system augmentation were
24 required, a flat annual purchase would be included as a Federal firm resource. This is

1 addressed in Section 4.3 of the Study. System augmentation purchase estimates are
2 detailed in Documentation Tables 9.1.1, 9.1.2, and 9.1.3, Line 33.

3 *Q. How do you treat annual firm surplus sales estimates in the Study?*

4 A. If BPA's annual firm energy resource forecast is greater or less than its load obligations,
5 BPA will calculate the amount of annual Firm Surplus Sale needed for the Federal system
6 to achieve annual firm energy load-resource balance. This sale is called "Firm Surplus
7 Sale." In both FY 2020 and FY 2021, the Federal system is forecast to be annual firm
8 energy surplus; therefore, Firm Surplus Sales are needed in each year. Forecast Firm
9 Surplus Sales of 193 aMW in FY 2020 and 53.4 aMW in FY 2020 are needed to maintain
10 annual load-resource balance. Firm Surplus Sales are forecast as flat annual sales and
11 included as a Federal obligation. This is shown in Section 4.3 of the Study. Firm surplus
12 sales estimates are detailed in Documentation Tables 9.1.1, 9.1.2, and 9.1.3, Line 16.

13 *Q. Does this conclude your testimony?*

14 A. Yes.

Table 1: Change in Loads by Load Type (FY 2020 to FY 2021)

| | Load Change | Percent of Change |
|-------------------------------------------|--------------------|--------------------------|
| 1. Load Following Total | 6 | 0.2 % |
| 2. Preference Customers | 0 | |
| 3. Fed. Agencies | 6 | 4.4 % |
| 4. USBR Obligation | 0 | |
| 5. Tier 1 Block Total | 2 | 0.3 % |
| 6. Slice Total | 24 | 0.9 % |
| 7. Slice Block | 38 | 2.9 % |
| 8. Slice Output from Tier 1 System | -13 | -0.9 % |
| 9. Direct Service Industries Total | 0 | |
| 10. Exports | -15 | -3.2 % |
| 11. Intra-Regional Transfers (Out) | -4 | -26.6 % |

Table 2: Change in Loads from BP-18 to BP-20

| | Load Change between BP-18 and BP-20 | Percent of Change |
|----------------------------------|--------------------------------------------|--------------------------|
| 1. Load Following | +6 aMW | +0.2 % |
| 2. Tier 1 Block | +73 aMW | +14.3 % |
| 3. Slice | -197 aMW | -6.4 % |
| 4. Direct Service Industries | -62 aMW | -84.0 % |
| 5. Exports | -35 aMW | -7.0 % |
| 6. Intra-Regional Transfers Out) | -48 aMW | -79.0% |
| 7. Total | -262 aMW | -3.5% |

