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TESTIMONY of

MARK A. JACKSON, KATHERINE L. BEALE, THOMAS D. COATNEY,

DANIEL H. FISHER, REBECCA E. FREDRICKSON, and CHRISTOPHER J. GILBERT

Witnesses for Bonneville Power Administration

SUBJECT: ANCILLARY AND CONTROL AREA SERVICE RATE DESIGN

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Section 1: Introduction and Purpose of Testimony

Q. Please state your names and qualifications.

A. My name is Mark A. Jackson, and my qualifications are contained in BP-14-Q-BPA-28.

A. My name is Katherine L. Beale, and my qualifications are contained in BP-14-Q-BPA-03.

A. My name is Thomas D. Coatney, and my qualifications are contained in BP-14-Q-BPA-11.

A. My name is Daniel H. Fisher, and my qualifications are contained in BP-14-Q-BPA-19.

A. My name is Rebecca E. Fredrickson, and my qualifications are contained in BP-14-Q-BPA-21.

A. My name is Christopher J. Gilbert, and my qualifications are contained in BP-14-Q-BPA-23.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to sponsor the ACS-14 Ancillary and Control Area Services Rate Design section in the Generation Inputs Study, BP-14-E-BPA-05 (Study), and Generation Inputs Documentation, BP-14-E-BPA-05A (Documentation), and the associated ACS-14 Ancillary and Control Area Service rates (ACS-14 Rate Schedule), BP-14-E-BPA-10.

Section 2: Ancillary and Control Area Services

Q. What are Ancillary Services?

A. Ancillary Services are needed to maintain reliability within and among the balancing authority areas affected by transmission service. All transmission service agreement holders must satisfy the reliability requirements associated with their energy transactions. BPA is required to provide, and transmission customers are required to purchase, Scheduling, System Control and Dispatch Service, and Reactive Supply and Voltage Control from Generation Sources Service. BPA is also required to offer to provide the following Ancillary Services to transmission customers serving load or integrating generation within the BPA balancing authority area: Regulation and Frequency Response Service, Operating Reserve Services (Spinning and Supplemental), and Energy Imbalance Service.

Q. What are Control Area Services?

A. Control Area Services are required for energy transactions in the BPA balancing authority area when the reliability obligations have not been met through Ancillary Services or some other arrangement, such as self-supply or dynamic transfer of the energy transaction to another balancing authority area. Resources or loads in the BPA balancing authority area must purchase Control Area Services from BPA to the extent they do not otherwise satisfy the reliability requirements associated with their energy transactions. BPA currently offers the following Control Area Services: Regulation and Frequency Response, Generation Imbalance, Operating Reserve (Spinning and Supplemental), Variable Energy Resource Balancing Service (VERBS), Supplemental Service, and Dispatchable Energy Resource Balancing Service (DERBS).

Q. *Where is the description of the calculation of the Ancillary and Control Area Service rates?*

A. The calculation for each Ancillary and Control Area Service rate is described in Study section 10. Each Ancillary and Control Area Service rate is also described in the proposed Transmission, Ancillary and Control Area Services Rate Schedules, BP-14-E-BPA-10.

Q. *Other than rate updates, are you proposing any significant changes to any existing Ancillary and Control Area Service rates?*

A. Yes.

Q. *Please identify the rates that you are proposing to significantly modify in this rate proceeding.*

A. We are proposing several significant changes to the VERBS rate. In addition, we are proposing modifications to the DERBS rate and modifications to the Generation Imbalance Service and Energy Imbalance Service rates.

Q. *Are you proposing to apply the Cost Recovery Adjustment Clause (CRAC), Dividend Distribution Clause (DDC), and Emergency NFB Mechanisms to balancing reserve capacity-based Ancillary and Control Area Services rates in this rate proceeding?*

A. Yes. *See* Mandell *et al*., BP-14-E-BPA-15, section 3.

Section 3: Regulation and Frequency Response Service

Q. *What is Regulation and Frequency Response Service?*

A. Regulation and Frequency Response Service provides the generation capability to (1) follow the moment-to-moment variations of loads in the BPA balancing authority area; and (2) maintain the power system frequency at 60 Hertz in conformance with

North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards.

Q. Who is charged for Regulation and Frequency Response Service?

A. Transmission customers serving load in the BPA balancing authority area are charged for Regulation and Frequency Response Service as an Ancillary Service. Loads in the BPA balancing authority area that are not served by a BPA transmission customer are charged for the Control Area Service of Regulation and Frequency Response, unless the customer can demonstrate to BPA's satisfaction that this obligation is met through other arrangements.

Q. What is the proposed rate for Regulation and Frequency Response Service?

A. The proposed rate is 0.12 mills per kilowatthour. Study Table 4, line 37. The costs for this service are developed in Study section 3 and recovered under the proposed ACS-14 Regulation and Frequency Response Service rate. Study section 10.3; ACS-14 Rate Schedule II.C and III.A.

Section 4: Imbalance Services

Q. What are Imbalance Services?

A. Imbalance Services are energy services that are required to balance positive or negative deviations for load or generation in the BPA balancing authority area. The two imbalance services are Energy Imbalance Service, which applies to load in the balancing authority area, and Generation Imbalance Service, which applies to generation in the balancing authority area. The rates for these services recover the cost of energy and do not recover the cost of balancing reserve capacity that BPA utilizes to provide Imbalance Services. Wellschlager *et al.*, BP-14-E-BPA-26, section 4; Study section 10.7.

Q. Please describe Energy Imbalance Service.

A. Energy Imbalance is provided when a load in the BPA balancing authority area receives an amount of energy different from the amount that the customer scheduled for delivery during a schedule period. To the extent that the BPA balancing authority absorbs or delivers an amount of energy that is different from the amount the customer scheduled for its load, BPA provides Energy Imbalance Service. Study section 10.7.1.

Q. Please describe Generation Imbalance Service.

A. Generation Imbalance Service is provided when a generator in the BPA balancing authority area generates an amount of energy different from the amount that the customer scheduled for delivery from the generator during a schedule period. To the extent that the BPA balancing authority absorbs or delivers an amount of energy that is different from the amount the customer scheduled for its generation, BPA provides Generation Imbalance Service. *Id.* section 10.7.2.

Q. Are you proposing any changes to the Generation Imbalance Service rate?

A. Yes, we are proposing to make three changes. First, we propose not to provide generator imbalance credit to generators that over-generate relative to remaining schedules during a scheduling period in which a generator's schedules have been curtailed. Second, we propose to change the definition of incremental cost for pricing Imbalance Energy. Finally, we propose to exempt variable energy resource customers that participate in the best available scheduling practice (currently 30/30 committed scheduling) from the 10 percent Deviation Band 2 charge under Generation Imbalance Service.

Q. Why are you proposing to provide no credit for negative deviations (where actual generation is greater than scheduled amounts) that occur during a scheduling period in which BPA has issued a curtailment or validated a curtailment issued by another balancing authority?

A. BPA has an obligation to maintain reliability within its balancing authority area and keep power flows within system operating limits. Generators must keep generation at or below curtailed schedule amounts so that BPA can manage the system and appropriately respond at the interchanges to curtailments issued by another balancing authority. Generator Imbalance Service is not a curtailment management service, and BPA does not want to encourage generators to over-generate during curtailments by paying for over-generation under those conditions.

Q. Why are you proposing to change the definition of incremental cost for Imbalance Energy?

A. As explained in Fisher *et al.*, BP-14-E-BPA-21, section 7, we are proposing to change the calculation of BPA's incremental cost for both Energy and Generator Imbalance Services from an hourly market index to a weighted average cost of energy deployed. Study section 10.7. We are proposing this change to better align the pricing of Imbalance Energy with the cost of providing that energy.

Q. What is the policy rationale for the proposed change for incremental cost?

A. The policy rationale for changing the definition of incremental cost is explained in the testimony of Fisher *et al.*, BP-14-E-BPA-21, section 7.

Q. Why are you proposing to exempt variable energy resources that participate in the best available scheduling practice, which currently is 30/30 committed scheduling, from the Deviation Band 2 charge under Generation Imbalance Service?

A. The purpose of the Deviation Band 2 charge is to encourage accurate scheduling behavior. Currently, customers cannot schedule better than 30/30 committed scheduling; thus, the 10 percent charge is unlikely to provide any additional incentive for customers to improve their scheduling accuracy.

If BPA offers 15-minute scheduling and an associated 30/15 committed scheduling Base Service, we would expect BPA to move the Deviation Band 2 exemption to apply solely to that service because 30/15 committed scheduling would then be the shortest committed scheduling period available. However, we are not proposing a 15-minute scheduling rate in this Initial Proposal. *See* Fisher *et al.*, BP-14-E-BPA-21, section 5.1.

Q. Why is it appropriate to retain the Deviation Band 2 charge for customers that participate in 30/60 committed scheduling or uncommitted scheduling?

A. As discussed above, the purpose of the Deviation Band 2 charge under generator imbalance service is to encourage accurate scheduling behavior. Retaining the Deviation Band 2 charge provides scheduling entities with an incentive to take actions to mitigate their schedule imbalances or to make investments to move toward intra-hour scheduling, which enables customers to reduce their schedule imbalances and the costs associated with generation imbalance service and balancing reserve capacity. Customers that elect 30/60 committed scheduling or uncommitted scheduling will have chosen a less accurate scheduling approach and could still adjust their schedules within hour to the 30/30 schedule amounts to reduce imbalance accumulation. Therefore, we are proposing to

retain the Deviation Band 2 charge for customers that elect 30/60 committed scheduling or uncommitted scheduling.

Section 4.1: Persistent Deviation Penalty Charge

Q. Please explain the Persistent Deviation penalty charge for Imbalance Services.

A. "Persistent Deviation" is defined in section III of the Transmission General Rate Schedule Provisions. Transmission Rate Schedules, BP-14-E-BPA-10, General Rate Schedule Provisions (GRSP) III.39. In general, Persistent Deviation refers to a difference between scheduled and actual generation, or between scheduled and actual load, that continues in the same direction longer than a certain period of time (*e.g.,* three hours) and greater than a certain megawatt amount (*e.g.,* 20 MW).

Q. Are you proposing to retain the Persistent Deviation penalty charge in the FY 2014–2015 rate period?

A. Yes. We are proposing to retain the Persistent Deviation penalty, with one change, which is to specify that customers participating in either form of committed scheduling (30/30 or 30/60 committed scheduling) will be exempt from the Persistent Deviation penalty charge.

Q. Why are you proposing to exempt customers participating in committed scheduling from the Persistent Deviation penalty charge?

A. Committed scheduling reduces schedule error and reduces bias in the pattern of schedule error, which in turn reduces imbalance energy accumulation. Study section 10.8.5. By proposing an exemption from Persistent Deviation penalties for 30/30 committed scheduling and 30/60 committed scheduling, we hope it motivates parties to elect a committed scheduling approach and thereby decrease bias in schedule error and overall energy imbalance accumulation.

Q. *How long has BPA had a Persistent Deviation penalty charge?*

A. In the WP-10 rate proceeding, BPA renamed the "Intentional Deviation" penalty charge to Persistent Deviation to remove the concept of intent and to define more objective criteria for identifying large and excessive schedule errors. Prior to the FY 2010–2011 rate period, BPA had a penalty charge for Intentional Deviations since FY 2002.

Q. *What is the proposed rate for the Persistent Deviation penalty charge?*

A. The proposed rate is the same as the ACS-12 rate. *See* ACS-12 Rate Schedule, BP-12-A-02C, II.D.2.c and III.B.2.c.

Q. *Is the Persistent Deviation penalty charge effectively a "wind-only" penalty charge?*

A. No. The Persistent Deviation penalty charge applies to all types of generation and load in the BPA balancing authority area.

Q. *Based on your analysis, how frequent are Persistent Deviation penalty charges for load?*

A. Load customers had 13 penalized persistent deviation events in October 2011, which was the first month in which new criteria for Persistent Deviation went into effect. Documentation Table 10.1, line 15. Since that time, we have observed an average of about three events per month. *See id.* lines 16-26. As a percentage of time, load customers incurred persistent deviation events less than 0.63 percent of the time in FY 2012. *Id.* line 28. In the months since October, loads avoided persistent deviations 99.6 percent of the scheduled hours. *See id.* lines 16-26.

Q. *Based on your study of actual scheduling data, how frequent are Persistent Deviation penalty charges for wind generators?*

A. The fleet average percentage of hours that were subject to Persistent Deviation penalties was 0.32 percent in FY 2011 and 0.49 percent in FY 2012. *Id.* lines 14 and 28. Some plants had no Persistent Deviation events. Almost 38 percent of the Persistent Deviation

events were incurred by three plants. Over 99 percent of the Persistent Deviation events accrued to less than half the wind fleet. Study section 10.8.4.

Q. *Is it possible for load and generation customers to avoid the Persistent Deviation penalty?*

A. Yes. Persistent and large schedule errors can be avoided by ensuring that the hourly schedule is established with as much available information as possible (close to the delivery hour) and by ensuring that schedule errors are observed and corrected as quickly as possible. Load and generation customers successfully avoided the Persistent Deviation penalty in over 99 percent of all hours, on average, in FY 2012. Documentation Table 10.1, line 28.

Q. *Are Persistent Deviation penalty charges avoidable only by small generators?*

A. No. Large wind generators (greater than 150 MW) and small wind generators (*e.g.*, less than 50 MW) both avoided Persistent Deviation penalties completely in some months. With the proposed change to exempt both 30/30 committed and 30/60 committed scheduling from Persistent Deviation charges, wind generators have an additional option to avoid Persistent Deviation penalties altogether.

Q. *How does the Persistent Deviation penalty charge support BPA's balancing services, such as VERBS?*

A. BPA's balancing services are used to manage variability caused by variable energy resources, loads, and dispatchable energy resources. BPA stands ready to deploy balancing reserve capacity for balancing services in real time to make up for schedule errors (generation different from scheduled amount or load different from the load schedule). In order to establish a quantity of balancing reserve capacity for balancing services, BPA must establish an assumed level of scheduling accuracy and identify the portion of the distribution of schedule errors that is covered by the balancing service. As

described in section 7, BPA will offer parties a choice of scheduling options and then will reflect those choices in its assessment of the total reserve capacity requirement. The Persistent Deviation penalty charge provides an incentive—as part of a suite of incentives—for parties to schedule accurately, and it helps ensure that large schedule errors are corrected quickly. Because balancing reserve capacity is treated as a pooled resource, Persistent Deviation penalties help ensure that no single party overuses the flexibility provided by the reserve capacity.

Q. Does BPA provide longer-term (hours-long or week-long) energy storage for generation and loads that are scheduled on the system as part of its balancing services, such as VERBS?

A. No. For balancing services such as VERBS, BPA provides system capability to increase or decrease generation over short time periods, but operational planning does not include providing storage capability over longer periods. BPA would need to make different assumptions about the nature of balancing service if it were to provide storage capability over longer periods as part of the service. Similarly, the timing and optimization of BPA's short-term marketing is planned without assuming that large amounts of energy will be used or stored over time as a result of generation and energy imbalance.

Q. What operational impacts do Persistent Deviations and energy imbalance accumulations have on BPA?

A. In order to successfully operate a large, integrated hydro system within required reliability and operating constraints, BPA must plan its operations and marketing in advance to manage the flow of water through the system. Kerns *et al.*, BP-14-E-BPA-23. BPA provides balancing reserve capacity for balancing services to maintain system reliability but assumes that schedule errors that cause deployment of that balancing reserve capacity are generally randomly distributed over time around an average schedule

error of approximately zero (*i.e.*, BPA expects to observe schedule deviations both above and below the scheduled amount, hour to hour). When this is the case, energy accumulates for only short periods of time in either direction, and storage or release of water does not accumulate. When the pattern of imbalance accumulation differs from that expectation, BPA must market or purchase power to return the BPA system to planned operations levels. Study section 1.8.5.

When schedules are inaccurate in the same direction for an extended period of time, BPA's ability to stay within its operating constraints may be jeopardized as the limited capability to store or release energy that is available for real-time balancing of schedule error is consumed by energy accumulation from past schedule error. Similarly, if schedules are routinely inaccurate at specific times of day or schedule inaccuracies follow a specific pattern, FCRPS generation operations can stray from the planned range during or after the schedule inaccuracies.

At times of tight constraints, reliability of load service can potentially be jeopardized if BPA is unable to recover from the imbalance accumulation through market purchases. Furthermore, if BPA's power supply obligations run significantly higher or lower than expected, BPA can be forced to make significant last-minute sales or purchases at or below market prices, spill water that could otherwise be used to produce energy, limit wind generators to schedules, or curtail transmission schedules. Because it is uncertain whether energy will be needed or available in the spot energy markets, BPA bears the risk of violating project or system constraints that BPA is statutorily obligated to maintain. If a violation occurs, BPA may incur power costs or forgo market opportunities in subsequent periods to restore an operation that is consistent with the safe and reliable implementation of all FCRPS statutory requirements.

Since it is uncertain whether the accumulated error will disappear over time, energy accumulation on the Federal system causes operational planning in the near term to become more uncertain. This relationship between past and current response to schedule errors is unique to large interconnected hydro systems.

Q. *Does the use of opposite direction schedule error to avoid Persistent Deviation penalty charges cause problems for BPA?*

A. Yes. We have observed patterns of schedule errors in which there is a large schedule error for two hours followed by a strong correction in the opposite direction. *Id.* Figure 10-5. When a scheduling agent schedules an amount of load or generation in the opposite direction of the schedule error observed in past hours, it affects BPA by depleting the balancing reserve capacity that is expected to be available for real-time errors. If scheduling agents deliberately include avoidable error in their schedules, they are effectively dispatching the FCRPS for their purposes, at the time they choose, without requesting the dispatch through a transaction or schedule. We believe such scheduling behavior is inconsistent with industry standard practice for best scheduling practices.

As noted above, BPA provides balancing services to cover unavoidable, unpredictable schedule errors caused by short-term variability in loads and variable energy resources or by unexpected events affecting dispatchable generators. Managing additional uncertainty to correct past schedule errors is not part of the service that BPA offers. In addition to creating additional risk for operational planning, if BPA were to assume parties would use balancing reserve capacity for both past and present schedule errors at the same time, or use schedule error to dispatch the FCRPS for other marketing reasons, it would increase the overall balancing reserve capacity requirement.

Q. Why do you want to motivate parties to adjust schedules close to or during the delivery hour?

A. Actual current conditions are a key factor in predicting near-term conditions. Particularly for variable energy resources, forecasts become significantly more accurate the closer they are to the delivery hour. Although loads are more predictable, the same holds generally true for loads. Schedule errors are minimized when the best possible forecasts are used.

Q. Do you expect customers that experience wind ramps or extreme, unpredictable events to incur Persistent Deviation penalty charges? Please explain.

A. BPA has established time windows for Persistent Deviation that are longer than most wind ramps. For the shortest time window of Persistent Deviation, BPA allows a fairly wide megawatt margin of error: the schedule error must exceed both 20 MW and 15 percent of the schedule. BPA expects that scheduling entities would be able to achieve that level of accuracy at least once every three hours, even during wind ramps or extreme events. Documentation Table 10.2. In our analysis, we discovered that wind ramps larger than the 20 MW and 15 percent of schedule criteria last two hours only 1.8 percent of the time, and they last three hours only 0.43 percent of the time. *Id.* Because wind ramps are less than the persistent deviation criteria more than 98 percent of the time, we believe scheduling agents should be able to react to wind ramps within the time window allowed. Wind ramps alone are unlikely to cause Persistent Deviations if scheduling agents are adjusting their schedules each hour.

Q. Does BPA waive the Persistent Deviation penalty charge for some events?

A. Yes. Customers and their scheduling agents that experience extraordinary circumstances or can demonstrate mitigating actions taken to reduce the duration or magnitude of their schedule errors may be eligible for a waiver of all or part of any Persistent Deviation

penalty charge. ACS-14 Rate Schedule II.D.2.c and III.B.2.c. Consistent with the FY 2012–2013 rates, we propose that BPA will consider such requests on a case-by-case basis, and will determine, at its sole discretion, whether to grant a partial or complete waiver. *Id.*

Section 5: Operating Reserve Services

Q. What is Operating Reserve?

A. Operating Reserve is the generating capacity necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment. Operating Reserve is required for the reliable operation of the interconnected power system. Within a balancing authority area, adequate generating capacity must be available at all times to maintain scheduled frequency and to avoid loss of firm load following transmission or generation contingencies. Operating Reserve is described as "contingency reserves" in the WECC standard, but for the purpose of this testimony and the Study, BPA refers to contingency reserves as Operating Reserve.

Q. Where is the forecast use of Operating Reserve services established?

A. The forecast use of Operating Reserves is established in the Operating Reserve Cost Allocation Study, Study section 4. Power Services provides the generation inputs for Operating Reserve based on a TS forecast of TS needs. TS forecasts the PS generation input requirement based on the historical Operating Reserve requirement in the BPA balancing authority area. Study section 4.3; Messinger *et al.*, BP-14-E-BPA-25, section 2.

Q. Are transmission customers allowed to obtain Operating Reserve from other suppliers?

A. Yes. Customers may self-supply Operating Reserve or obtain it from a third-party supplier. Customers must elect their supplier of Operating Reserve for the two-year rate period.

Q. What happens if a customer that self-supplies or acquires Operating Reserve from a third party fails to meet BPA's Operating Reserve criteria?

A. If a customer fails the criteria for self-supply or third-party supply established in the Operating Reserves Business Practice, it must take Operating Reserve from BPA to meet the reserve requirement and pay the default rates for Spinning and Supplemental Operating Reserves.

Q. How are the proposed default rates determined?

A. The default rate is a penalty rate to encourage customers to meet their commitment to self-supply or third-party supply Operating Reserve. The rate is 15 percent higher than the rate for normal service and is the same percentage as used in the FY 2012–2013 rate schedules. We consider this to be a reasonable penalty at this time to encourage compliance with BPA's self-supply and third-party supply criteria. No parties have defaulted in the FY 2012–2013 rate period as of October 2012. The default rate is applied the same as the normal rate to the billing factors of those customers in default. Study section 10.4.3.

Section 6: Variable Energy Resource Balancing Service

Q. Please briefly describe Variable Energy Resource Balancing Service (VERBS).

A. VERBS provides the generation capability (ability to both increase and decrease generation) to follow within-hour variations of variable energy resources, primarily wind, in the BPA balancing authority area. VERBS is required to maintain the power system

frequency at 60 Hertz in conformance with NERC and WECC reliability standards and provide the regulation, following, and imbalance reserve capacity needed to support wind resources. The VERBS service is separated into three components: regulation, for moment-to-moment variability; following, for longer-term variability within the hour; and imbalance, for additional longer-term variability within the hour caused by scheduling error. Puyleart *et al.*, BP-14-E-BPA-22, section 2.

Q. What changes do you propose to make to the VERBS rate for BP-14?

A. We propose to establish three VERBS "Base Service" rates, which are based on the scheduling election of the variable energy resource customer.

First, we propose a 30/60 committed scheduling Base Service rate that is based on a 30/60 scheduling accuracy assumption for wind generators that BPA used for the FY 2012–2013 rates. Fisher *et al.*, BP-14-E-BPA-21, section 5.

Second, for customers that choose to participate in 30/30 committed scheduling, we propose a 30/30 committed scheduling Base Service rate that is based on a 27 percent discount to the 30/60 committed scheduling Base Service rate. *Id.* In the FY 2012–2013 rate period, BPA established a Committed Intra-Hour Scheduling Pilot that enabled customers to receive a rate discount if they agreed to submit a schedule consistent with or better than the scheduling quantity that BPA communicates to the customer 30 minutes prior to the start of every hour. Our 30/30 committed scheduling Base Service rate proposal transitions the 30/30 Committed Intra-Hour Scheduling Pilot that BPA established in FY 2012–2013 out of "pilot" status.

Third, we propose a higher rate for customers that elect to pay the "uncommitted scheduling" Base Service rate, where customers retain flexibility to schedule both on an hourly and an intra-hour basis without any requirement to follow a consistent scheduling accuracy benchmark. We propose to base the rate for uncommitted scheduling on a

45/60 scheduling assumption. *Id.* (explaining the policy rationale for a 45/60 scheduling assumption for uncommitted scheduling); *see also* Puyleart *et al.*, BP-14-E-BPA-22 (calculating the balancing reserve capacity requirement for uncommitted scheduling). The rate premium for this service is 22 percent higher than the imbalance component rate under 30/60 committed scheduling Base Service. Study section 10.5.1.

In addition to VERBS Base Service rates, we are proposing a new "Full Service" charge. We also propose to replace the formula rate adjustments established in FY 2012–2013 with four new formula charges to ensure cost recovery for balancing reserve capacity purchases made during the rate period to provide balancing services under certain conditions. *See also* Klippstein *et al.*, BP-14-E-BPA-24, section 6 (explaining the cost allocation methodology for Type 1, 2, 3, and 4 purchases of balancing reserve capacity).

Additionally, we are proposing a VERBS Credit to VERBS customers for balancing reserve capacity from the FCRPS that becomes unavailable to provide VERBS Base Service during the rate period.

Finally, we propose to eliminate the rate for Provisional VERBS (also known as "Provisional Balancing Service").

Q. Where is the policy rationale for VERBS Base Service and Full Service described?

A. The policy rationale for VERBS Base Service and Full Service in the Generation Inputs is explained in the testimony of Fisher *et al.*, BP-14-E-BPA-21, section 5.

Q. Where are the proposed rates for VERBS Base Service stated?

A. The rates for VERBS Base Service, which include rates for 30/30 committed scheduling, 30/60 committed scheduling, and uncommitted scheduling options, and rate exceptions, are stated in the ACS-14 Rate Schedule III.E.2.a and Study section 10.5.1.

Q. If because of a legal challenge to Dispatcher Standing Order 216 (DSO 216), BPA is prevented from implementing DSO 216 or is required to amend it materially, what rate will apply to VERBS Base Service customers?

A. In the BP-12 rates, BPA included a formula rate adjustment that enabled BPA to recover its costs for purchases of balancing reserve capacity if a legal proceeding prevented BPA from utilizing DSO 216. For the upcoming rate period, we are proposing to replace that formula rate adjustment with the requirement for VERBS Base Service customers to purchase Full Service at the total Full Service charge. ACS-14 Rate Schedule III.E.2.c.3. This will enable BPA to continue to provide VERBS to its customers and ensure cost recovery if BPA is required to materially change its application of DSO 216 as a reliability and operational protocol.

Q. Who is subject to the proposed rates for VERBS?

A. All wind and solar variable energy resources in the BPA balancing authority area that do not self-supply some or all of their balancing reserve requirement are subject to the applicable VERBS Base Service rate. *Id.* III.E.2.c.

Q. Under your proposal, why do customers that participate in 30/30 committed scheduling receive a Base Service rate discount?

A. The balancing reserve capacity requirement for the imbalance component of VERBS depends on scheduling accuracy. In contrast, the regulation and following components are not significantly affected by the scheduling accuracy. Under 30/30 committed scheduling, the level of scheduling accuracy that a customer must meet is predetermined, which allows BPA to assume a reduction in the imbalance balancing reserve capacity requirement. The reduction to the imbalance component relative to the imbalance requirement for committed 30/60 hourly scheduling forms the basis for rate reduction.

See Fisher *et al.*, BP-14-E-BPA-21, section 5.1; Puyleart *et al.*, BP-14-E-BPA-22, section 7.

Q. *How do you calculate the rate discount?*

A. We developed preliminary estimates of the rate discount by running a case study that assumed the entire wind fleet elected to use 30/30 committed scheduling, which produced a reduced balancing reserve capacity requirement for wind. We then calculate that difference into the balancing reserve capacity requirement and applied the resulting cost savings to the VERBS Base Service 30/30 committed scheduling rate. *See* Puyleart *et al*., BP-14-E-BPA-22, section 7.

Q. *Under your proposal, why do customers that select the "uncommitted scheduling" Base Service option receive a higher VERBS Base Service rate?*

A. The balancing reserve capacity requirement for uncommitted hourly scheduling is higher than the reserve requirement for 30/60 committed scheduling. Fisher *et al.*, BP-14-E-BPA-22, section 5.1; Study section 2.10. We forecasts the balancing reserve capacity requirement for uncommitted scheduling to be equivalent to the balancing reserve capacity required under a 45/60 scheduling assumption (that is, 45-minute persistence scheduling accuracy assumption for 60-minute schedules). Fisher *et al.*, BP-14-E-BPA-21, section 5.1 (explaining the policy rationale for a 45/60 scheduling accuracy assumption for uncommitted scheduling).

Q. *How would BPA determine the Base Service billing factor for wind generators' installed capacity each month?*

A. For wind-powered variable energy resources, the proposed billing factor is the installed capacity, which is the same billing factor used in the last two rate periods. BPA would determine the installed capacity for each wind-powered variable energy resource in the BPA balancing authority each month during the rate period. *See* ACS-14 Rate Schedule

III.E.2.b. For wind projects that have completed installation of all units, the installed capacity will be the aggregate nameplate of the generating units. For projects for which some but not all units are installed before the 15th of the month that is prior to the billing month (that is, some units are generating energy), the installed capacity will be the project's highest hourly output from the generator measured from the time of the initial operation up to the end of the 15th day of the month prior to the billing month. Using the maximum hourly output of the generating units enables BPA to approximate the total installed capacity for projects that are still under construction. This approximation is necessary for wind projects still under construction because BPA will not know the exact amount of installed capacity at any given time.

Q. What is the rationale for this method?

A. This method for measuring the installed capacity of incomplete projects ensures that for each billing month, the billing factor will be as close as possible to the project's installed capacity. In addition, using the 15th day of the month as a cutoff date provides BPA sufficient time to prepare the monthly billing. Additional generating units installed after the 15th will be picked up during the next monthly billing cycle. This adjustment applies only to projects that are under construction. Once construction of the project is complete, BPA will require each generator to submit in writing the aggregate nameplate of its generating units. If the generator does not respond to BPA's request to supply its nameplate capacity after installation, BPA will use the best information available (*e.g.*, the installed capacity listed in the customer's interconnection agreement) to determine installed capacity of the generating facility.

Q. How would BPA determine the Base Service billing factor for solar generators' installed capacity each month?

A. For solar-powered variable energy resources, the billing factor is the greater of the maximum one-hour generation or the nameplate of the plant in kilowatts. *Id.* III.E.4. We expect that solar resources will interconnect the entire project within a single billing month, so BPA would use the project nameplate capacity when the facility is energized to calculate the billing factor for the following month unless a greater kilowatt quantity is delivered during some later hour prior to the 15th of the month prior to the billing month. This larger quantity will then become the new billing factor.

Q. Why are you proposing the monthly installed capacity as the billing factor for VERBS?

A. We are using installed capacity of wind and solar as the billing factor for VERBS because it correlates well with each VERBS customer's actual need for balancing reserve capacity. *See* Puyleart *et al.*, BP-14-E-BPA-22. Furthermore, installed capacity is simple to calculate and administer, easy for both BPA and its customers to understand, and readily implemented in the BPA billing system. BPA has utilized installed capacity as the billing factor for Wind Balancing Service since FY 2009.

Q. What is your concept for "Full Service" under VERBS?

A. As explained in Fisher *et al.*, BP-14-E-BPA-21, section 5.2, we expect Full Service VERBS to provide a high level of balancing reserve capacity that provides a commensurately higher level of reliability curtailment risk mitigation for customers taking the service. Under Full Service, BPA would determine the balancing reserve capacity needed based on forecast wind volatility and forecast deviations, and BPA would attempt to acquire balancing reserve capacity to meet the forecast need. *Id.* We expect BPA to make purchases of this balancing reserve capacity across several time horizons such as weekly purchases, prior to close of pre-schedule day-ahead purchases

and possibly purchases made closer to the operating hour, but not within the operating hour. *Id.*

Q. Who would be subject to Full Service?

A. VERBS customers taking either 30/30 committed scheduling or 30/60 committed scheduling are eligible to purchase Full Service. As explained in Fisher *et al.*, BP-14-E-BPA-21, section 5.2, customers that elect uncommitted scheduling are not eligible to purchase Full Service.

In addition, if because of a legal challenge to DSO 216 BPA is prevented from implementing DSO 216 or is required to amend it materially, all customers taking VERBS Base Service will be subject to Full Service and will pay the Full Service rate.

Q. What is the charge for Full Service?

A. The proposed charge is based on a monthly formula that will recover the costs for balancing reserve capacity purchases made for Full Service for each month. Study section 10.5.5.

Q. How does Generation Imbalance Service differ from VERBS?

A. The Generation Imbalance Service rate provides only the energy value required by the generation imbalance *(i.e.,* the difference between scheduled generation and actual generation). The cost of the balancing reserve capacity that stands ready to provide this energy on short notice is not included in energy charges billed under the Generation Imbalance Service. The cost of the balancing reserve capacity is instead included in the VERBS rate.

Q. Does BPA recover the cost of balancing reserve capacity that is provided to balance variable energy resources through the Generation Imbalance Service rate?

A. No. As mentioned above, the Generation Imbalance Service rate recovers only the energy costs.

Q. *How does VERBS differ from Regulation and Frequency Response Service?*

A. While the Regulation and Frequency Response Service rate, like VERBS, is designed to recover capacity costs, the service provides balancing reserve capacity for only the regulation component (moment-to-moment variations) for load. VERBS, in contrast, provides following and imbalance components, in addition to the moment-to-moment regulating balancing reserve capacity component, for variable energy resources. The costs of balancing reserve capacity for the following and imbalance components for load are recovered through power rates. Fisher *et al.*, BP-14-E-BPA-21, section 2.

Q. *Does BPA recover the cost of balancing reserve capacity that is provided to balance variable energy resources through the Regulation and Frequency Response Service rate?*

A. No. We determine the balancing reserve capacity requirement for each service and allocate costs accordingly. The rates are designed to recover the costs of the balancing reserve requirements for each specific service. As a result, there is no duplicative recovery of costs.

Section 6.1: Balancing Reserve Capacity Purchases during the Rate Period

Q. *Do you expect that BPA will make any balancing reserve capacity purchases to provide VERBS during the rate period?*

A. Yes, we expect BPA will attempt to make purchases of *inc* balancing reserve capacity during the rate period. *Id.* section 5.1. We do not expect BPA to purchase *dec* balancing reserve capacity. *Id.*

Q. *Under which conditions would you expect BPA to make a purchase of* inc *balancing reserve capacity to provide balancing services such as VERBS?*

A. We expect BPA to attempt to purchase balancing reserve capacity to: (1) make up the difference between the forecast availability of balancing reserve capacity from the

FCRPS (Kerns *et al.*, BP-14-E-BPA-24, section 4) and the forecast balancing reserve capacity need to maintain a 99.5 percent level of service (Puyleart *et al.*, BP-14-E-BPA-22, section 5) ("Type 1 purchases"); (2) replace Federal balancing reserve capacity that becomes unavailable ("Type 2 purchases"); (3) provide balancing reserve capacity sufficient to meet a higher-quality level of reserve service for customers who elect the VERBS Full Service option ("Type 3 purchases"); or (4) increase the amount of balancing reserve capacity held for BPA's balancing services ("Type 4 purchases"). Study sections 10.5.3 to 10.5.6.

Q. *In the current FY 2012–2013 rates, how would BPA recover the costs of incremental purchases of balancing reserve capacity?*

A. The BP-12 rates contain two formula rates that, when triggered, adjust the VERBS imbalance component rate. The formula rates were designed to ensure that BPA can recover its costs from the users that created the need for the balancing reserve capacity.

Q. *How do you propose to recover the costs of purchases of balancing reserve capacity purchases in FY 2014–2015?*

A. We are proposing to replace the BP-12 formula rate adjustments with four new "Formula Purchases Charges" to recover the costs associated with each type of balancing reserve capacity purchase. Our cost allocation methodology determines the balancing reserve capacity purchase costs that are recovered under each formula charge. Klippstein *et al.*, BP-14-E-BPA-24, section 6 (explaining the cost allocation methodology for purchases of balancing reserve capacity to provide balancing services, including Dispatchable Energy Resource Balancing Service and VERBS). We explain the calculation for each Formula Purchases Charge in Study sections 10.5.3 to 10.5.6.

Q. *Would BPA have any incentives to minimize costs associated with purchases of balancing reserve capacity?*

A. Yes. BPA would develop business practices that describe our acquisition guidelines and processes. BPA will be open and transparent regarding after-the-fact disclosure of the cost and deployment of acquired balancing capacity. Since all costs are passed through to purchasers, and BPA does not add fees to purchase prices, BPA does not have any financial motivation to select more expensive resources when lower-cost resources are available.

Q. *If a Purchases Charge is triggered, would all VERBS Base Service customers receive a charge?*

A. Not necessarily. Type 1 and 2 Purchases Charges would apply to all customers that take VERBS Base Service. *Id.* sections 10.5.3 and 10.5.4. However, the Type 3 Purchases Charge would apply only to customers taking Full Service. *Id.* section 10.5.5; *see also* ACS-14 Rate Schedule III.E.2.c.3. (describing the Full Service rate condition on Base Service rates). Moreover, Type 4 Purchases Charges would be directly assigned to the individual customer that creates the unanticipated increase in balancing reserve capacity to support VERBS for that customer. Study section 10.5.6.

Q. *For the Type 1 and Type 2 Purchases Charges, how are you proposing to determine a variable energy resource's* inc *requirement?*

A. To calculate the Type 1 and Type 2 Purchases Charges, we calculate the balancing reserve capacity requirements for each Generating Facility based on the Generating Facility's nameplate capacity and Base Service scheduling election. We calculate the balancing reserve capacity requirement for each component (regulation, following, imbalance) of VERBS as a percentage of installed capacity, and the components taken from BPA for VERBS Base service are then summed together. *See* Documentation

Table 2.31. We use these percentages to determine an individual resource's *inc* reserve capacity requirement for purposes of establishing the billing factor for allocating Type 1 and Type 2 purchases. *Id.*; Study sections 10.5.3.1 and 10.5.4.1.

Q. Why are you proposing to use a variable energy resource's inc *reserve capacity requirement for all components of VERBS to calculate the Type 1 and Type 2 Formula Purchases Charges?*

A. Type 1 and Type 2 purchases would be made to provide the VERBS Service. However, different resources use different components of VERBS Base Service. For example, the imbalance component for VERBS is not a part of Base Service for solar resources or for customers that elect to self-supply the imbalance component. Additionally, each variable energy resource's balancing reserve capacity requirement will vary based on the variable energy resource's scheduling election because scheduling elections with shorter scheduling periods will require less balancing reserve capacity. Using the *inc* reserve capacity requirement for each component allows BPA to allocate costs based on the individual need of each resource taking VERBS Base Service.

Q. For the Type 2 Purchases Charge, why are you proposing to use the total monthly VERBS charges from base rates and the total of the DERBS inc *and* dec *charges to determine the percentage for allocating costs between the two services?*

A. The rate for VERBS Base Service combines *inc* and *dec* balancing reserve capacity costs in each component. In contrast, the rates for DERBS service are separated for *inc* and *dec* balancing reserve capacity costs but combine all three balancing reserve capacity components. A total charge common denominator for allocating costs between the two services is created when both *inc* and *dec* DERBS charges are added together and all charges for VERBS Base Service rate components are added together.

We reviewed allocating the costs using: (1) the total hourly base *inc* charge; (2) the total monthly base charge; or (3) a fixed percentage established for the rate period. We are proposing to use the total monthly base charge because it is easier to implement and provides a higher level of accuracy over the fixed percentage.

Q. Do you propose to provide notice and an opportunity to comment before BPA decides to make a purchase of balancing reserve capacity to provide VERBS during the rate period?

A. For VERBS Base Service Type 1 and Type 2 purchases of balancing reserve capacity for a term that exceeds 60 days' duration, we propose that BPA would provide advance notice and opportunity to comment on the acquisition. For Type 1 and Type 2 purchases of balancing reserve capacity that are for a term of 60 days or less, we are proposing that BPA would give notice of the purchase after the fact. For Type 3 purchases under VERBS Full Service, however, we expect to develop the acquisition strategy and notice and comment procedures that apply to Full Service in the ACS Practices Forum. Fisher *et al.*, BP-14-E-BPA-21, section 5.2. For Type 4 purchases, we are not proposing to give public notice and comment because the cost of those purchases are directly assigned under the proposed Type 4 Purchases Charge to the customer that creates the need for the purchase of balancing reserve capacity for balancing services.

Q. Why are you proposing that BPA would give only after-the-fact notification of short-term (60 days or less) Type 1 and Type 2 purchases of balancing reserve capacity for VERBS Base Service?

A. There is a trade-off between having time to notice the shorter-term purchase and receive comments and executing the shorter-term agreements. We believe that if we have clear guidelines for the acquisitions, then after-the-fact notification is the best business procedure for the shorter-term purchases.

Q. When would customers see Type 1, 2, 3, and 4 Formula Purchases Charges on their billing statements?

A. The purchase costs for Type 2 Formula Purchases Charges are allocated across all VERBS and DERBS resources using the total charges at base rates for the month. This methodology will require extra time to calculate each month, therefore, the charges for these types of purchases may not be available until the billing statement following the statement for the current invoice cycle. Type 1, Type 3, and Type 4 purchases should be available on the next billing cycle.

Q. What is Provisional VERBS (also known as "Provisional Balancing Service")?

A. Provisional Balancing Service is a "default" service that is available to wind facilities that did not elect to take VERBS from BPA but interconnect during the rate period and to VERBS customers that can no longer self-supply one or more components of VERBS. Under this service, BPA does not acquire additional balancing reserve capacity, and the Provisional Balancing Service customer is subject to DSO 216 before other customers that have elected VERBS from BPA.

Q. Are you proposing to retain Provisional Balancing Service for the FY 2014–2015 rate period?

A. No.

Q. Why are you proposing to discontinue Provisional Balancing Service?

A. We are now proposing to purchase additional balancing reserve capacity and directly assign those costs under the Type 4 Purchases Charge to customers: (1) that do not elect to take VERBS from BPA but nevertheless choose to interconnect during the rate period; (2) that elect to self-supply but cannot continue to self-supply for the rate period; (3) that elect to participate in committed scheduling but fail to meet BPA's performance requirements; or (4) that elect to participate in committed scheduling but then choose to

change their scheduling election mid-rate period to a scheduling option that has a longer scheduling period. Study section 10.5.6. BPA would directly assign the costs of balancing reserve capacity purchases under the Type 4 Purchases Charge to the customer creating the need for the purchase under the above circumstances. *Id.*

Q. *What does "self-supply" mean with regard to VERBS?*

A. Self-supply is the provision by a VERBS customer of balancing reserve capacity either for its own use or for use by the pool of customers taking VERBS from BPA. Self-supply can take several forms, such as the current performance-based Customer Supplied Generation Imbalance (CSGI) pilot, capacity purchased by the customer or BPA on behalf of the customer for Supplemental Service, or capacity provided by a customer to BPA to deploy to meet some or all of the customer's reserve capacity requirement for Full Service.

Q. *Do you expect self-supply of one or more components of VERBS during the rate period?*

A. Yes. We expect self-supply of the base imbalance component in the amount of 1,505 MW nameplate of wind on average over the rate period. Study section 10.5.1; Documentation Table 2.17.

Q. *How would BPA know that a variable energy resource customer intends to self-supply one or more components of VERBS during the rate period?*

A. BPA would require VERBS customers to elect to take one of the Base Service scheduling options for the rate period or elect to self-supply one or more components of VERBS Base Service. Customers must make these elections by April 1, 2013.

Q. If a customer that self-supplies one or more components of VERBS fails to satisfy BPA's self-supply requirements during the rate period, what service do you propose to offer to that customer?

A. As mentioned above, the customer may elect the Base Service scheduling option that best meets its needs. The customer may also elect to take Supplemental Service, and the customer may also elect to take Full Service if it elects to take 30/60 committed scheduling or 30/30 committed scheduling. The customer will be responsible for any balancing reserve capacity purchase costs that are necessary to meet its reserve requirements for the remainder of the rate period. Study section 10.5.6.

Q. How would BPA know if a variable energy resource customer is expected to interconnect to the BPA balancing authority area during the rate period?

A. There is a significant lead time for interconnection studies, construction of interconnection facilities, and construction of wind generators. By the time BPA issues its Final Proposal, we should have a clear indication of the status and expected completion date of wind generation under development and expected to interconnect during the rate period.

Q. If a customer advances its interconnection date into the rate period from an originally expected post-2015 date, what type of service do you propose to offer to that customer?

A. As mentioned above, the customer can elect the VERBS Base Service scheduling option that best meets its needs. The customer would pay the cost of any balancing reserve capacity purchases that are needed to meet the incremental reserve requirement of that customer for the remainder of the rate period. *Id.* In addition, the customer may elect to take Supplemental Service to increase its quality level of service and mitigate its risk of curtailment under DSO 216. Finally, if the customer elects to take VERBS Base Service 30/30 committed scheduling or 30/60 committed scheduling, the customer may elect to

take Full Service. Fisher *et al.*, BP-14-E-BPA-21, section 5; *see also* ACS-14 Rate Schedule III.E.2.c.3.

Section 6.2: VERBS Supplemental Service

Q. What is VERBS Supplemental Service?

A. Supplemental Service utilizes *inc* or *dec* capacity beyond the customer's allocation of reserve capacity for Base Service to mitigate the impacts of DSO 216. Customers can elect to have BPA purchase balancing reserve capacity for deployment by BPA, or the customer can self-supply capacity to BPA, and BPA will deploy the capacity.

Q. Are you proposing any changes to the rate for Supplemental Service?

A. Yes. The rate is the same as the BP-12 rate, but as discussed in more detail below, we are proposing to remove the administrative charge that applied under the BP-12 Supplemental Service rate. In addition, in response to customer feedback, we are now proposing to make shorter-term monthly capacity purchases for the customer, and BPA will be able to recognize on-demand capacity e-Tags for capacity purchased by customers on much shorter time horizons. The details for implementation changes for Supplemental Service will be described in business practice modifications. Fisher *et al.*, BP-14-E-BPA-21, section 3 (discussing the ACS Practices Forum).

Q. How do you propose to recover the cost for VERBS Supplemental Service?

A. We propose to recover the costs through a formula rate for any acquisitions made by BPA at customer request. ACS-14 Rate Schedule section III.E.5. The formula rate includes a monthly charge for all supplemental balancing reserve capacity supplied by BPA during a month. We expect to purchase supplemental balancing reserve capacity based on customer requests for specified periods during a year. The rate for supplemental balancing reserve capacity will be established on a periodic basis for a

period of a month or longer, as established in the business practice covering Supplemental Service. We propose to base the rate on the average cost of supplemental balancing reserve capacity purchased by BPA for all customers during the period of the purchase.

Q. Are there other costs for Supplemental Service in addition to the balancing reserve capacity purchase costs?

A. There are administrative costs associated with implementing the service. However, these costs are included in the forecast of Wind Integration Team (WIT) costs. In this Initial Proposal, we propose to assign WIT costs directly to the VERBS rate. Klippstein *et al.*, BP-14-E-BPA-24, section 4. Since these costs are now included in BPA's WIT cost proposal, we have proposed to eliminate the direct administrative charge for Supplemental Service.

Q. Why is a formula rate necessary to recover the cost of VERBS Supplemental Service?

A. Because customers can elect Supplemental Service from BPA on a monthly basis, BPA needs the ability to calculate costs on a monthly basis and a rate mechanism to recover those costs from the customers that cause those costs to be incurred.

Q. Who would be subject to the proposed VERBS Supplemental Service rate?

A. Customers taking any of the VERBS base services would be eligible to take Supplemental Service. *See* ACS-14 Rate Schedule III.E.1.

Q. What type of balancing reserve capacity would BPA make available under the proposed VERBS Supplemental Service?

A. BPA will acquire either or both *inc* and *dec* capacity for Supplemental Service, or the customer can self-supply the capacity to BPA for deployment. However, with regard to *dec* reserve capacity, most parties in the region have not expressed great concern about DSO 216 limits that require feathering of the output of wind plants to scheduled amounts

during over-generation events that exhaust the total *dec* balancing reserve capacity made available in the BPA balancing authority for wind, load, and other generation. DSO 216 implementation for over-generation events effectively causes the wind plant to self-supply *dec* reserve capacity. For the BP-14 rate period, we are proposing not to acquire non-Federal *dec* balancing reserve capacity, in addition to any amounts of *dec* balancing reserve capacity that can be provided by the FCRPS, to provide VERBS Base Service. Fisher *et al.*, BP-14-E-BPA-21, section 5.1. Since we are proposing that BPA limit the amount of *dec* balancing reserve capacity it provides, we intend to expand Supplemental Service to provide individual customers the option to acquire additional non-Federal *dec* balancing reserve capacity. *Id*.

Q. How does Supplemental Service differ from VERBS Full Service?

A. Customers are in control of how much balancing reserve capacity under Supplemental Service they want to self-supply, purchase, or have BPA purchase to mitigate DSO 216 curtailment risk. In contrast, under our conceptual framework, VERBS Full Service would be based on the forecast likely imbalances of a customer that will require *inc* capacity beyond what BPA is providing under Base Service. As a result, the customer's total balancing reserve capacity requirement for Full Service will vary. As described in Fisher *et al.*, BP-14-E-BPA-21, section 5.2, BPA will determine the balancing reserve capacity acquisition strategy for Full Service customers in the ACS Practices Forum and establish requirements for customers that choose to self-supply.

Section 6.3: VERBS Rate for Solar Resources

Q. Are you proposing to make any changes to the rate design for the VERBS rate for solar resources?

A. No, the rate design will remain the nameplate of the VERBS Solar Resource.

Q. How would BPA determine the billing factor for solar-powered variable energy resource installed capacity each month?

A. BPA would use the project nameplate capacity when the facility is energized to calculate the billing factor for the following month unless a greater kW quantity is delivered during some later hour prior to the 15th of the month prior to the billing month. ACS-14 Rate Schedule III.E.4.b.

Q. Would the VERBS Solar rate be subject to the proposed Formula Purchases Charges that apply to VERBS?

A. Solar resources would be subject to the Type 1, Type 2, and Type 4 Purchases Charges. A solar resource's share of these charges is based on the total balancing reserve capacity requirements for regulating and following reserves of the resource. Study sections 10.5.3, 10.5.4, and 10.5.6.

Section 6.4: VERBS Credit for Hydro-Related Reductions in Balancing Reserve Capacity from the FCRPS

Q. Why are you proposing a VERBS Credit?

A. We are proposing a credit to the base VERBS rates, *inc* or *dec*, to reimburse customers for the cost of balancing reserve capacity that was forecast to be available from the FCRPS but is not provided for by the FCRPS because of hydro system conditions. Study section 10.5.7; *see also* Fisher *et al.*, BP-14-E-BPA-21, section 6 (discussing the policy rationale for the VERBS credit). The proposed rates for the credit are stated in ACS-14 Rate Schedule III.E.7.

Q. Who would be eligible for the VERBS Credit?

A. Customers taking all three components of VERBS Base Service would be eligible to receive the VERBS Credit. CSGI participants are not eligible for the VERBS Credit. Study section 10.10.5.7; *see* Fisher *et al.*, BP-14-E-BPA-21, section 6.

Q. Would solar resources receive a VERBS rate credit for hydro-related reductions in balancing reserve capacity?

A. No. As noted above, the VERBS Credit would apply only to customers taking all three components of Base Service. The VERBS rate for solar resources does not contain an imbalance component. Because solar resources will not receive a reduction in service during hydro-related reductions of balancing reserve capacity from the FCRPS for regulation and following, the proposed VERBS Credit will not apply.

Q. Are there any limitations to the VERBS Credit?

A. The total *inc* and *dec* credit amount for the proposed VERBS Credit will not exceed the total VERBS charge from Base Service base rates for each resource. ACS-14 Rate Schedule III.E.7.c.

Section 7: Dispatchable Energy Resource Balancing Service

Q. What is Dispatchable Energy Resource Balancing Service?

A. Dispatchable Energy Resource Balancing Service (DERBS) is a Control Area Service necessary to support the within-hour deviations of dispatchable energy resources from the hourly generation estimate (*i.e.*, the generation schedule). DERBS is provided by increasing or decreasing committed online Federal generation (through the use of AGC equipment) as necessary to follow the moment-by-moment changes in thermal generation relative to the schedule, including ramps between hours. DERBS is required to maintain

the power system frequency at 60 Hertz in conformance with NERC and WECC reliability standards.

Q. *Do you propose to make any changes to the DERBS rate? If so, please summarize those proposed changes.*

A. We are proposing two changes to the DERBS rate. First, we are proposing to base the billing factor for the DERBS rate on measuring the maximum hourly generation imbalance for each plant using a five-minute average energy from the plant revenue meter rather than the current one-minute average of the plant Supervisory Control and Data Acquisition (SCADA) meter. Second, we are proposing to apply two Formula Purchases Charges to DERBS customers to ensure cost recovery for balancing reserve capacity purchases made during the rate period to provide balancing services.

Q. *Why are you proposing to base its calculation of the DERBS rate on five-minute average revenue meter data instead of one-minute average SCADA meter data?*

A. The proposed change is motivated by two factors. The SCADA meter data are not available to customers, while revenue meter data are visible, so changing to the revenue meter system promotes transparency for customers reviewing details of their bills for DERBS service. Revenue meter data are also preferred to SCADA meter data because the revenue meter system is configured to be more robust against inaccuracies than the SCADA meter system. Revenue meter data also have a process for being corrected as needed, whereas SCADA meter data do not. While one-minute averaging is possible with the SCADA meter system, the revenue meter system is currently set up to have five-minute average readings as the shortest time averaging period available.

Q. *How does the proposed billing factor affect the DERBS rate?*

A. The proposed billing factor increases the nominal rate but has, by itself, no effect on the overall revenue requirement being collected. All else being equal, most DERBS

customers will see little change in their monthly DERBS bill. The impact on the nominal DERBS rate is an increase of approximately six percent above what it would be for the one-minute billing factor. If BPA retained the one-minute billing factor for DERBS, the new *inc* rate would be approximately 21.42 mills per kilowatt for each hour, and the new *dec* rate would be approximately 2.55 mills per kilowatt for each hour.

Q. Is your proposal to utilize five-minute average revenue meter data to calculate the DERBS rate consistent with the Balancing Reserve Capacity Quantity Forecast for DERBS, which relies upon one-minute supervisory control and data acquisition data? Please explain.

A. Yes. The Balancing Reserve Capacity Quantity Forecast, based on one-minute data, is calculated to provide sufficient balancing reserve capacity for very rare imbalance events occurring within the BPA balancing authority area, at levels estimated to be exceeded in only one-half of one percent of all such periods during the rate period. Study section 2.7.2. Only the SCADA system can provide data with granularity this fine, and it measures the variability or capacity to which the balancing resources must respond. The billing factors, taken as the largest of the 12 five-minute intervals in each hour, also measure the imbalance caused by each DERBS generator. The Balancing Reserve Capacity Quantity Forecast is determined by the one-minute SCADA meter data, which in turn determines the revenue requirement. The expected annual total DERBS billing requirement measures the capacity used by an individual generator and will determine its monthly DERBS bill.

Q. Where is the forecast use of DERBS balancing reserve capacity established?

A. The forecast use of balancing reserve capacity for DERBS is included in Study sections 2 and 10.

Q. Did you change anything in the forecast use of DERBS capacity?

A. Yes. Our recent review of five-minute data from FY 2012 for DERBS customers indicated that the balancing reserve capacity quantity for DERBS *inc* service decreased from our initial forecast of 61 MW by about 15 percent to 52 MW. The generation inputs revenue forecast listed in Study Table 1 does not take into consideration this reduction in the balancing reserve capacity requirement because our rate studies and rate calculation tables for the Initial Proposal were already finalized and could not be updated in time for the Initial Proposal. Nevertheless, in the ACS-14 rate schedule, we adjusted the proposed DERBS rate downward based on a proposed 15 percent reduction in the balancing reserve capacity requirement for DERBS. The balancing reserve capacity-based Ancillary and Control Area Services revenue forecast listed in Study Table 1 do not account for this adjustment. In the Final Studies, however, we will update the rate calculations in Table 1 based on the best information available at that time. We will also review DERBS customers' actual use of balancing reserve capacity (starting from October 2011) and factor any changes to the balancing reserve capacity requirement into the DERBS rate for the Final Proposal.

Q. Do you expect the DERBS reserve requirement to change by the Final Proposal?

A. It is possible that the forecast balancing reserve capacity requirement for DERBS will decrease. We are aware that one large dispatchable energy resource may leave the BPA balancing authority area during the rate period. As noted above, the final rate studies will be based on the best information available regarding this possibility. It is also possible that we will need to update the balancing reserve capacity requirement based on the balancing reserve capacity requirement for DERBS customers during the period after October 2011.

Q. How is the proposed DERBS rate consistent with the principle of cost causation?

A. The revenue requirement for the DERBS rate is calculated based on the balancing reserve capacity required by DERBS customers during the test period. Study section 2.7. The expected annual billing determinant is also based on a study of DERBS customers' historical usage of generation imbalance capacity. Finally, because the DERBS rate is based on actual use and will apply to only the users of balancing reserve capacity, the DERBS rate is consistent with the principle of cost causation.

Q. Why are you proposing to retain a 2 MW dead band for the DERBS rate?

A. We propose to retain the 2 MW dead band for the FY 2014–2015 rates because we have seen no evidence that some other structure would better allocate costs to those generators causing them. A 2 MW dead band is of sufficient size to manage most station control errors. This approach also ensures that the users of DERBS compensate BPA to the extent they utilize DERBS above 2 MW.

In addition, a 2 MW dead band ensures that the balancing reserve capacity costs associated with large station control errors are not shifted to other users of DERBS. By including a dead band under DERBS, the costs associated with the balancing reserve capacity under the dead band are spread across a higher per-megawatt rate. Thus, as the size of the dead band increases, so do the costs associated with the larger dead band, which materialize in the form of a higher per-megawatt rate for all users of DERBS.

Q. Why are you proposing to exempt certain five-minute average periods from the DERBS rate calculation for schedule deviations that were caused by automatic voltage control systems that corrected a grid frequency deviation?

A. A generator's required governor will move the generator away from its current generation level to stabilize grid frequency when system frequency deviates sufficiently from 60 Hz. Under these circumstances, we are proposing that BPA not charge customers for

deviations from schedule that benefit grid stability. Exempting periods when this is occurring means that DERBS bills will not reflect generator imbalances driven by grid-stabilizing governor responses.

Q. *Based on the proposed cost allocation methodology (Klippstein et al., BP-14-E-BPA-24), which type of balancing reserve capacity purchase costs are you proposing to recover from DERBS customers?*

A. Based on the cost allocation methodology described in the testimony of Klippstein *et al.*, BP-14-E-BPA-24, we are proposing to recover the costs of Type 2 and Type 4 purchases of balancing reserve capacity from DERBS customers. The cost allocation methodology determined that DERBS customers are not subject to Type 1 purchase costs for the FY 2014–2015 rate period and Type 3 purchase costs are inapplicable to DERBS customers. *Id.* section 6; *see* ACS-14 Rate Schedule III.F.4.

Q. *When would the proposed Type 2 Purchases Charge apply?*

A. The Type 2 Purchases Charge is designed to recover the cost of purchases of non-Federal balancing reserve capacity that are necessary to replace Federal balancing reserve capacity that becomes unavailable during the rate period. Klippstein *et al.*, BP-14-E-BPA-24, section 6. The Type 2 Purchases Charge is based on the dispatchable energy resource's proportion of total costs from the purchase of non-Federal balancing reserve capacity. Study section 10.6.2.1. The proportional costs would be spread to the dispatchable energy resources by the appropriate billing factors. *Id.*

Q. *For the Type 2 Purchases Charge, why are you proposing to use the total monthly VERBS charge from VERBS Base Service base rates and the total of the DERBS* inc *and* dec *charges to determine the percentage for allocating costs between the two services?*

A. The rate for VERBS Base Service combines *inc* and *dec* balancing reserve capacity costs in each component. In contrast, the rates for DERBS service are separated for *inc* and

dec balancing reserve capacity costs but combines all three reserve components. A total charge common denominator for allocating costs between the two services is created when both *inc* and *dec* DERBS charges are added together and all charges for VERBS base service rate components are added together.

We also reviewed allocating the costs using (1) the total hourly base *inc* charge; (2) the total monthly base charge; or (3) a fixed percent established for the rate period. We are proposing to use the total monthly base charge because it is easier to implement and provides a higher level of accuracy over the fixed percent. The total hourly base *inc* charge method, in contrast, is more complex and difficult to administer from a billing standpoint. This is because the billing factors for VERBS and DERBS are different, and it is necessary to use the DERBS billing factor on an hourly basis to determine the allocation percentage for VERBS and DERBS.

Q. When would the proposed Type 4 Purchases Charge apply?

A. The Type 4 Purchases Charge is designed to recover the cost of additional balancing reserve capacity purchases that are necessary to provide DERBS to a customer because: (1) the customer elected to self-supply but is unable to continue self-supplying DERBS; (2) the customer has a projected generator interconnection date after FY 2015, but chooses to interconnect during the FY 2014–2015 rate period; or (3) the dispatchable energy resource operating in another balancing authority area chooses to dynamically transfer into the BPA balancing authority area during the FY 2014–2015 rate period. Study section 10.6.3.

Q. What is the policy rationale for the cost allocation of balancing reserve capacity purchases?

A. For the policy rationale, see the testimony of Fisher *et al.*, BP-14-E-BPA-21, section 6, and Klippstein *et al.*, BP-14-E-BPA-24.

Q. *How does DERBS differ from Regulation and Frequency Response Service?*

A. While the Regulation and Frequency Response Service rate, like DERBS, is designed to recover capacity costs, RFR service provides balancing reserve capacity only for the regulation component (moment-to-moment variations) for load. DERBS, in contrast, provides following and imbalance components, in addition to the moment-to-moment regulating balancing reserve capacity component, for dispatchable energy resources. The costs of balancing reserve capacity for the following and imbalance components for load are recovered through power rates. The different rate approaches ensure that BPA recovers its costs from the users that create the costs and is designed to avoid duplicative cost recovery for balancing reserve capacity.

Q. *How does DERBS differ from Generator and Energy Imbalance Service?*

A. Generation Imbalance Service provides only the energy value required by generator imbalance (*i.e.*, the difference between scheduled generation and actual generation). The cost of the balancing reserve capacity that stands ready to provide this energy on short notice is not included in energy charges billed under the Generation Imbalance Service. The cost of the balancing reserve capacity is instead included in the DERBS rate.

Energy Imbalance Service provides only the energy value required by load imbalance (*i.e.*, the difference between scheduled load and actual load). The cost of the balancing reserve capacity that stands ready to provide this energy on short notice is not included in energy charges billed under the Energy Imbalance Service. The cost of the balancing reserve capacity is instead included in the Regulation and Frequency Response rate.

Q. *Does this conclude your testimony?*

A. Yes.