INDEX

TESTIMONY of

RONALD E. MESSINGER, DANNY L. CHEN and JANET ROSS KLIPPSTEIN

Witnesses for Bonneville Power Administration

SUBJECT: OPERATING RESERVE COST ALLOCATION

Page

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Section 1: Introduction and Purpose of Testimony

Q. Please state your names and qualifications.

A. My name is Ronald E. Messinger, and my qualifications are contained in BP-14-Q-BPA-46.

A. My name is Danny L. Chen, and my qualifications are contained in BP-14-Q-BPA-10.

A. My name is Janet Ross Klippstein, and my qualifications are contained in BP-14-Q-BPA-37.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to sponsor section 4 of the Generation Inputs Study, BP-14-E-BPA-05 (Study) and section 4 of the Generation Inputs Study Documentation, BP-14-E-BPA-05A (Documentation). We explain how Operating Reserve amounts are forecast and describe the proposed cost allocation for Operating Reserve.

Section 2: Operating Reserve Forecast

Q. What is Operating Reserve?

A. Operating Reserve constitutes the generating capacity necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment. Within a balancing authority area, adequate generating capacity must be available at all times to maintain scheduled frequency and avoid loss of firm load following generation or transmission contingencies. Operating Reserve is described as "Contingency Reserves" under the Western Electricity Coordinating Council (WECC) reliability

standard. For the purpose of this testimony, BPA refers to this reserve capacity as Operating Reserve, which is consistent with definitions contained in BPA's Open Access Transmission Tariff (OATT).

Q. Please describe BPA's relationship to the Northwest Power Pool (NWPP).

A. BPA is a participating member of the NWPP Reserve Sharing Program for Contingency Reserves. By participating in the Reserve Sharing Program, BPA is better positioned to meet NERC disturbance control standards due to access to a deeper and more diverse pool of shared reserve resources. Participation in this program also increases efficiency in that the shared reserve obligation for the group as a whole is less than the sum of all the individual participants' reserve obligations. By sharing reserves, participants are entitled to use not only their own "internal" reserve resources, but also may call on other participants for assistance if their internal reserve capacity does not fully cover a contingency.

Q. When is Operating Reserve needed?

A. Operating Reserve is needed when forced outages of generation or transmission equipment occur. Within a Reserve Sharing Group, such as the NWPP, adequate generating capacity must be available at all times to maintain scheduled frequency and avoid loss of firm load following generation or transmission contingencies.

Q. What is Spinning Operating Reserve?

A. Spinning Operating Reserve is a portion of the total Operating Reserve. Spinning Operating Reserve is provided by the unloaded generating capacity of the system's firm resources that are synchronized to the power system, responsive to frequency deviations, and ready to serve additional demand. These firm resources must respond immediately to serve load in the event of a system contingency and be capable of providing the full Spinning Operating Reserve obligation within 10 minutes. WECC requires each

balancing authority area to maintain a Spinning Operating Reserve obligation equal to a minimum of 50 percent of its Operating Reserve obligation.

Q. What is Supplemental (Non-Spinning) Operating Reserve?

A. Supplemental (Non-Spinning) Operating Reserve is the portion of the total Operating Reserve obligation that does not meet the definition of Spinning Operating Reserve. Supplemental Operating Reserve is generating capacity that is not necessarily synchronized to the system but is capable of serving demand within 10 minutes, or interruptible load that can be removed from the system within 10 minutes. This reserve capacity must be capable of fully synchronizing to the system and ramping to meet load within 10 minutes of a contingency.

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

A. Yes. The BPA OATT allows transmission customers to obtain Operating Reserve by (1) self-supply; (2) purchase from a third party; or (3) purchase from BPA Transmission Services (TS). Currently, the BPA business practice for Operating Reserve allows transmission customers to either make a two-year election to have TS as their supplier or choose another supplier. The transmission customer has the option to change non-TS suppliers annually. If the customer does not make an affirmative election to self-supply or acquire Operating Reserve from a third party, the customer must purchase Operating Reserve from TS.

Q. Have any transmission service agreement holders elected to obtain Operating Reserve from sources other than BPA?

A. Yes, some transmission customers have elected to obtain Operating Reserve from other suppliers, either by self-supply or third-party supply to meet their reserve obligation within the BPA balancing authority area.

Q. If transmission service agreement holders elect alternative sources of Operating Reserve, what is the impact to BPA generation inputs for Operating Reserve?

A. If transmission customers elect to self-supply or third-party supply their Operating Reserve obligation, the amount of BPA-supplied generation inputs for Operating Reserve is reduced. Study section 4.3; Documentation Table 4.2.

Q. How do you determine the forecast reserve obligation for Operating Reserve?

A. We forecast the requirement based on historical Operating Reserve requirements in the BPA balancing authority area. We first forecast the balancing authority area requirement consistent with the WECC standard based on a statistical regression approach. We then forecast the expected amount of reserve obligation that transmission customers will elect to self-supply or third-party supply Operating Reserve based on the elections as of May 2011, which reduces the BPA Operating Reserve requirement. The remainder is the amount forecast to be supplied by BPA through generation inputs. Study section 4.3.

Q. What is the current WECC Operating Reserve requirement that applies to balancing authority area operators?

A. The current WECC standard for Operating Reserve (BAL-STD-002-0) establishes the minimum amount of spinning and non-spinning (Supplemental) Operating Reserve that BPA must set aside for its balancing authority area. The minimum Operating Reserve is currently the greater of (a) the loss of generating capacity due to forced outages of generation or transmission equipment that would result from the most severe single contingency; or (b) the sum of 5 percent of the balancing authority's load responsibility served by hydro and wind generation and 7 percent served by thermal generation. At least 50 percent must be spinning reserve.

Q. Is there a proposal to change the current WECC Operating Reserve requirement that applies to balancing authority area operators? Please explain.

A. Yes. WECC is seeking approval for BAL-002-WECC-1, which states that the minimum Operating Reserve requirement is the greater of the most severe single contingency or the sum of 3 percent of load and 3 percent of generation. The WECC Board approved the proposed BAL-002 standard in June 2012 and is currently awaiting approval from NERC and the Federal Energy Regulatory Commission (Commission).

Q. Are you proposing to change its reserve requirement assumptions for the Operating Reserve forecast during the FY 2014–2015 rate period? Please explain.

A. No. The reserve requirement assumption for the Operating Reserve forecast depends on the timing of BAL-002-WECC-1 approval. This assumption is based on the best available information at the time the forecast is made. BPA made a split assumption in the FY 2010–2011 and FY 2012–2013 rate cases, using the requirements of 5 percent of hydro/wind generation and 7 percent of thermal generation in the first year, and 3 percent of both generation and load in the second year based on WECC approval and assumption of Commission approval during the rate period. However, Commission approval did not occur, and the standard was remanded back to WECC. Currently, however, we believe that it is likely that the Commission will decide to approve the BAL-002-WECC-1 regional reliability standard effective on or before the start of the FY 2014–2015 rate period.

Q. Why are you proposing to forecast Operating Reserve requirements for FY 2014–2015 using only the requirements of the new proposal currently under consideration for NERC approval?

A. Based on the WECC revisions to the standard that address the issues raised by the Commission, and the WECC Board's approval of the standard in June 2012, we anticipates that NERC and Commission approval is likely to occur in FY 2013, allowing

sufficient implementation time for the proposed standard to be effective for the FY 2014–2015 rate period.

Section 3: Allocating Cost for Operating Reserve

Q. Are you proposing any changes to the Operating Reserve cost allocation as compared to the FY 2012–2013 cost allocation for Operating Reserve?

A. No. There are no proposed changes to the embedded cost methodology for Operating Reserve. Study section 4.4.

Q. Please give a general overview of your proposed embedded cost calculation for Operating Reserve.

A. The net revenue requirement associated with the hydro resources capable of providing Operating Reserve is divided by the sum of the regulated and applicable independent hydro projects capacity uses and the total reserve requirement. The result is a unit cost for all uses of capacity, which is multiplied by BPA's Operating Reserve obligation to allocate embedded costs to Operating Reserves.

Q. What was the derivation of the revenue requirement attributable to the subset of resources capable of providing Operating Reserve?

A. The embedded cost Net Revenue Requirement for Operating Reserve is composed of (1) power-related costs of the relevant hydro projects on a project-specific basis; (2) an allocation of associated fish mitigation costs; (3) allocation of the administrative and general expense; and (4) three revenue credits. Study section 4.4.3; Documentation Table 4.5. The revenue requirement associated with the resources capable of providing Operating Reserve is consistent with BPA's Power Revenue Requirement Study, BP-14-E-BPA-02, chapter 2, Table 2F.

Q. Please describe the system resources available for providing Operating Reserve.

A. To determine the system resources identified for the Operating Reserve cost allocation, we first identify those Federal resources in the BPA balancing authority area available to provide Operating Reserve. An example of a resource not able to supply Operating Reserve is Columbia Generating Station (CGS), which operates most economically at 100 percent capacity. As such, it has no ability to respond to requests for additional capacity to be dispatched in the event of a disturbance. Some small run-of-river independent resources also are not able to supply Operating Reserve due to operational limitations, and some small independent hydro resources are outside of BPA's balancing authority area. All remaining system resources are available to provide Operating Reserve – Spinning or Operating Reserve – Supplemental. Study section 4.4.2; Documentation Table 4.4.

Q. Please describe how you quantify the size of the system that is used to allocate costs for the Operating Reserve uses of the system.

A. We sum the regulated hydro projects, applicable independent hydro projects that can be counted on for capacity uses, and the total reserve requirement. We use a 120-hour peaking capacity measurement for the regulated hydro resources. For a detailed discussion of the 120-hour peaking capacity, see Study section 3.2. The independent hydro resources' capacity is based on mid-month elevations. The calculation uses the 1958 water year, which represents average water conditions. The total reserve requirement includes Regulating, Load Following, Operating, Dispatchable Energy Resource Balancing Service, and Variable Energy Resource Balancing Service balancing reserve capacity, as determined by the Balancing Reserve Capacity Quantity Forecast. Study section 2; Documentation Tables 2.18–2.22.

Q. Please describe why you add Regulating, Load Following, Operating, Dispatchable Energy Resource Balancing Service, and Variable Energy Resource Balancing Service reserve capacity to the regulated and independent resource capacity value for purposes of determining the total capacity system uses.

A. The two models (a combination of HYDSIM and HOSS models) used to quantify the 120-hour peaking capability of the regulated hydro include a reduction to the system capability for balancing and operating reserve capacity. Therefore, to correctly capture the entire amount of capacity available for system uses, we add the reserve capacity (which is a use of the system) back into the capacity quantities. Study section 4.4.1.

Q. Do you use the same methodology proposed to allocate embedded costs to Operating Reserve for both Spinning Operating Reserve and Supplemental Operating Reserve?

A. Yes, although the Spinning Operating Reserve does have a variable cost component added to its cost allocation. *Id.*

Q. Why did you add a variable cost component to the Spinning portion of the Operating Reserve cost allocation and not the Supplemental portion?

A. Ensuring that sufficient Spinning Operating Reserve exists at all times to respond to a qualifying contingency imposes a measurable variable cost on the system. See Study section 3.4 and Klippstein *et al*., BP-14-E-BPA-24, section 5, for further discussion of these variable costs. Therefore, we assigned a variable cost component to the Spinning portion of the Operating Reserve cost allocation. *Id.*

Q. What is the unit cost and total forecast cost allocation for Operating Reserve?

A. The total forecast cost allocation for Operating Reserve on an annual average basis is $50,939,235. The unit cost for the Supplemental portion is $7.26 per kW per month, comprised of only an embedded cost allocation. The unit cost for the Spinning portion is $7.93 per kW per month, comprised of an embedded cost allocation of $7.26 per kW per

month plus a variable cost allocation of $0.67 per kW per month. Study sections 4.4.3–4.4.5.

Q. How do you propose BPA recover its costs when Operating Reserve is called upon to deliver energy?

A. When Operating Reserve is utilized to provide energy, that energy is priced based on an hourly energy index in the Pacific Northwest, or an alternative index if an adequate hourly index is not available, as determined by BPA. Study sections 10.4.1–10.4.2. We are forecasting no revenue from the energy associated with deployment of reserve capacity, because BPA will be compensated at the current market price at the time of deployment. There is no difference in cost recovery between using the energy for an Operating Reserve deployment and selling the power off the trading floor.

Q. Does this conclude your testimony?

A. Yes.