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TESTIMONY OF
ERIC V. KING

Witnesses for Bonneville Power Administration

SUBJECT: Pacific Northwest Coordination Agreement

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ATTACHMENT A

1 TESTIMONY OF

2 ERIC V. KING

3 Witnesses for Bonneville Power Administration

4
5 **SUBJECT: PACIFIC NORTHWEST COORDINATION AGREEMENT**

6 **Section 1. Introduction and Purpose of Testimony**

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

8 A. My name is Eric V. King. My qualifications are contained in PNCA-02-Q-BPA-01.

9 *Q. What is the purpose of your testimony?*

10 A. The purpose of my testimony is to explain the new Interchange Energy rate that parties to
11 the Pacific Northwest Coordination Agreement (PNCA) have established under the 1964
12 PNCA.

13 *Q. How is your testimony organized?*

14 A. My testimony is in three sections. Section 1 outlines the purpose of the testimony.
15 Section 2 describes the PNCA and the process by which the parties establish rates under
16 the PNCA. Section 3 describes Amendatory Agreement No. Five to the PNCA and the
17 associated proposed charge for Interchange Energy imbalances.

18 **Section 2. General Description of the Pacific Northwest Coordination Agreement**

19 *Q. What is the PNCA?*

20 A. The PNCA is an agreement for planned operations among the utilities and other entities
21 that operate the major electric generating facilities and systems in the Pacific Northwest.
22 The PNCA parties include five investor-owned utilities, five public utility districts, three
23 municipalities, the subsidiary of an aluminum producer, the United States (acting through
24 the Administrator of the Bonneville Power Administration (BPA); the Division Engineer,
25 North Pacific Division, U.S. Army Corps of Engineers; and the Bureau of Reclamation),
26 and the United States Entity for the Columbia River Treaty. The PNCA is the successor

1 to three prior short-term agreements. It was effective on January 4, 1965, and will expire
2 on June 30, 2003. The PNCA parties have entered into a replacement agreement, known
3 as the 1997 Pacific Northwest Coordination Agreement (“1997 PNCA”). The 1997
4 PNCA will become effective when the Federal Energy Regulatory Commission (FERC)
5 approves it as to those PNCA parties that are jurisdictional to FERC.

6 *Q. Please explain coordination under the PNCA.*

7 A. The basic concept of the PNCA is that all PNCA parties will jointly and cooperatively
8 determine the aggregate firm load that can be served by the generating facilities the
9 parties have submitted for coordination under the PNCA. This quantity is known as the
10 total Firm Load Carrying Capability or FLCC. The FLCC is the amount of firm load that
11 can be served under coordinated operation of the aggregate electric generating facilities
12 and systems of the PNCA parties, assuming the reoccurrence of critical streamflow
13 conditions and the use of all PNCA parties’ reservoir storage. The PNCA does not
14 require any PNCA party to operate in a manner inconsistent with its requirements for
15 nonpower uses or functions.

16 *Q. How is coordination achieved?*

17 A. Coordination is achieved through exchanges of energy and capacity among the various
18 PNCA parties. Annually, the PNCA parties: 1) develop detailed plans for operation of
19 those generating facilities submitted for coordination under the PNCA; and 2) calculate
20 the FLCC for each PNCA party and for the coordinated system as a whole. In operations,
21 each PNCA party’s FLCC is sustained first from generation from its own coordinated
22 resources and then through exchanges of energy with other PNCA parties. Each PNCA
23 party has committed to make any excess of its coordinated resources over its FLCC
24 available to any other PNCA party that has a deficit of coordinated resources to FLCC.
25 These transfers of excess capability are known as Interchange. Because of the variability
26 of hydroelectric generation, at times during the year PNCA parties will have surplus

1 generation relative to their FLCC (resulting in an export of Interchange), and at other
2 times they will have a deficit relative to their FLCC (resulting in an import of
3 Interchange). Over time these transfers of Interchange tend to net to zero. In effect,
4 therefore, they are exchanges. Interconnecting transmission facilities of the PNCA parties
5 are also made available for use in these exchanges, subject to the owner's prior
6 obligations.

7 *Q. If Interchange transactions tend to net to zero why is there a charge for Interchange*
8 *Energy?*

9 A. Although in theory Interchange will net to zero over some period of time, there is no
10 guarantee that it will. The PNCA Parties realized that in the event that Interchange does
11 not net to zero the parties that had supplied more Interchange than they had received
12 should be compensated. Without a charge for IE, the PNCA parties would run the risk
13 that the distribution of benefits from coordination would be inequitably shared.

14 *Q. Why would Interchange not net to zero?*

15 A. There are a number of reasons why Interchange may not net to zero. PNCA parties are
16 not required to take Interchange even when they have a right to do so. Therefore, parties
17 that choose not to take Interchange may develop an imbalance with other parties that do
18 choose to take it. In addition, under some water conditions, a given PNCA party may
19 have more surpluses (resources greater than its FLCC) than deficits, while other parties
20 have more deficits, again leading to an imbalance.

21 *Q. Are rates for energy exchanges contemplated under the PNCA?*

22 A. Yes. One of the principles of the PNCA is that equitable charges are assessed for
23 capacity, energy, transmission, storage, and other services that are provided as part of the
24 coordination of the various systems. These charges are listed in both the 1964 PNCA and
25 the 1997 PNCA. The revenues that BPA receives form only a small percentage of BPA's
26 revenue requirement. This is especially true for IE; because IE tends to act as an

1 exchange, revenues received for the most part balance the expenses incurred. The net
2 effect on revenues is negligible. Nonetheless, the rates provide the underlying structure
3 of accounts and charges that allows for the efficient coordination of generating facilities
4 and systems in the Pacific Northwest.

5 *Q. Please briefly describe how rates and charges are set up in the PNCA.*

6 A. Rates and charges in the PNCA are either direct charges, which are explicitly specified, or
7 charges by reference, which are based on a direct charge or a variable index. The PNCA
8 allows the PNCA parties to reexamine charges every five years and has a mechanism
9 under which the parties renegotiate charges. Charges by reference are useful because they
10 help to maintain the charge at an appropriate level as the market price of energy changes.
11 This maintains the consistency and balance that were attained at the time of the initial
12 negotiation.

13 *Q. Is the 1997 PNCA currently in effect?*

14 A. No. The 1997 PNCA does not go into effect until all regulatory approvals are obtained.
15 Since not all approvals have been obtained, the original PNCA is still in effect. The
16 planning provisions of the 1997 PNCA will become effective the February 1 following
17 the receipt of all required approvals, and the operational provisions become effective on
18 the August 1 following the receipt of approval. Once the 1997 PNCA goes into effect,
19 and assuming the proposed IE rate is adopted and approved, the parties to that agreement
20 will amend the 1997 PNCA in order to incorporate the new IE rate.

21 *Q. Please describe Amendatory Agreement No. Five ("AA5").*

22 A. AA5 is an amendment to the PNCA that updates the method for determining the price for
23 IE and converts IE from a direct charge of 22.55 mills per kilowatt-hour to a charge by
24 reference. The energy market has undergone dramatic change since the existing IE rate
25 was adopted in 1995. The industry has experienced a sharply increased degree of
26 volatility as well as unprecedentedly high energy prices. Since the 1997 PNCA is not yet

1 in effect and the PNCA parties have not received any indication when FERC will grant
2 the remaining approvals, the PNCA parties agreed that it would be prudent to update the
3 charge for IE under the existing PNCA. The parties agreed that the rate for IE should be
4 converted to a charge by reference and therefore become more dynamic and responsive to
5 changing conditions.

6 **Section 3. Pacific Northwest Coordination Agreement Transactions and Rates**

7 *Q. What rates and charges will your testimony address?*

8 A. We will address only the charge for Interchange Energy imbalances and the effect the
9 change in this charge will have on the IE Service charge. Attachment A shows the
10 proposed charge for IE imbalances.

11 *Q. Please describe Interchange Energy (IE).*

12 A. IE is the energy component of Interchange (as opposed to capacity). It is delivered by one
13 utility system to another, and may be returned later, usually within the same Contract
14 Year (August 1 through July 31). IE is made available, when needed, such that each party
15 can reach its full Firm Energy Load Carrying Capability (FELCC). FELCC is the energy
16 component of FLCC. FELCC is, in planning, the total amount of firm energy that can be
17 produced and shaped to load by a utility under critical streamflow conditions. Under the
18 PNCA, each party must make available its generating capability that exceeds its FELCC
19 to other PNCA parties that have insufficient generation to meet their FELCC. This
20 excess energy is IE.

21 *Q. Please describe how IE transactions are implemented.*

22 A. When one PNCA party supplies IE from its own resources to another PNCA party, such
23 delivery is considered an "initial delivery" of IE. Parties that receive IE must return the
24 IE at a later time if the supplying system requests it. As a PNCA party receives initial
25 deliveries of IE, an IE imbalance, or an obligation to return IE, is established. This IE
26 imbalance is decreased when the party returns the IE to the supplying system or transfers

1 “previously received” IE to another PNCA party that requests IE (thereby transferring the
2 IE imbalance and the obligation for the return). A PNCA party may accumulate an IE
3 imbalance with one or more supplying parties either directly through the receipt of initial
4 deliveries or indirectly by receipt of previously received IE from third parties.

5 *Q. How are IE imbalances calculated and tracked?*

6 A. An IE Imbalance is the net of IE delivered and returned between two PNCA parties.
7 Since each PNCA party may have a unique IE Imbalance with each other PNCA party,
8 separate accounts for each pair of PNCA parties are established to record the IE
9 imbalances.

10 *Q. In general, how are payments for IE Imbalances handled?*

11 A. A PNCA party owes an IE charge when it receives more IE from another PNCA party
12 than it has returned to that party. This imbalance is measured and “cashed out”—that is,
13 the parties settle the imbalances by payments to each other— at the end of any operating
14 year (July 31) in which the Coordinated System reservoirs have refilled to at least 98% of
15 capacity. In theory, this reservoir level signals that reservoirs have reset and are ready to
16 enter another “critical period.” A critical period is that period, assuming adverse stream
17 flows of historical record, adjusted for changes in use, during which the least amount of
18 estimated firm energy load can be served from the firm resources of the PNCA parties.
19 The PNCA assumes that over a critical period of streamflows IE will net to zero. If an IE
20 imbalance remains when a potential new critical period starts (reservoirs have again
21 refilled to at least 98% of capacity at the end of an operating year), the imbalance is again
22 wiped off the “books” by means of the cash out. This procedure protects the PNCA
23 parties from accruing extremely large IE imbalances. In addition, since it may take many
24 years for reservoirs to refill to 98% and trigger the “cash out” of IE, the PNCA allows the
25 delivering parties to demand payment for IE when it is delivered. Such payments are
26

1 called “interim cash payments” and are made at the end of each month. A final
2 settlement of the remaining IE imbalance takes place when IE is “cashed out.”

3 *Q. What is the proposed mechanism for IE charges?*

4 A. The charge for initial delivery of IE is established on the day of delivery. This is
5 necessary because the charge for IE is established by reference, and changes each day an
6 initial delivery of IE is made. Accounts established for each party record the total charges
7 accrued and the total IE delivered. As explained below, the charge for initial deliveries of
8 IE is based on the Dow Jones Mid-Columbia Firm index. The charge for the return of IE
9 is determined as follows: when BPA returns IE to another PNCA party, BPA determines
10 the net of all IE imbalance payments owed by BPA to such party and IE imbalance
11 payments owed to BPA from such party since the last time IE imbalances were cashed
12 out. This calculation is made without taking into account any interim cash payments that
13 have been made. Next BPA determines the net of all IE BPA has received from the other
14 party and returned to such party since the last cash out. Dividing the net payment
15 obligation by the net returns yields the rate for the return of the IE. This formula sets the
16 rate for return of IE at the melded average rate for the outstanding IE imbalance and
17 assures that if all the IE is returned the total exchange of money between parties will net
18 to zero.

19 *Q. What is Loaned Interchange Energy?*

20 When a PNCA party delivers IE, it may declare the IE to be Loaned Interchange Energy.
21 Loaned Interchange Energy has the same function as IE but has no charge and more
22 liberal return provisions. Loaned Interchange Energy imbalances are “zeroed out”—that
23 is, deemed to be zero—when IE is cashed out. Therefore, PNCA parties generally make
24 every effort possible to ensure that the imbalance of Loaned Interchange Energy is
25 reduced as much as possible before being zeroed out. PNCA parties usually deliver
26

1 Loaned Interchange Energy in order to take advantage of the more liberal return
2 provisions.

3 *Q. What is the charge for initial deliveries of IE based on?*

4 A. The charge for an initial delivery of IE is based on the market value of energy at the Mid-
5 Columbia hub. The charge for initial deliveries of IE is the same regardless of whether
6 the IE is supplied from a hydroelectric or thermal resource, and the price per megawatt
7 hour is based on the Dow Jones Mid-Columbia Firm index. The Dow Jones Mid-
8 Columbia index was chosen because the price at the Mid-Columbia is readily available
9 from a published source and is a good representation of energy prices in the Northwest.
10 The Dow Jones Mid-Columbia Firm index segments the hours of the day into “On Peak”
11 and “Off Peak” hours. Each day the index publishes an on-peak price and an off-peak
12 price. Initial deliveries of IE are separated into deliveries made during on-peak hours and
13 those made during off-peak hours. The charge is the sum of two figures: 1) the product
14 of the On Peak deliveries and the On Peak price; and 2) the product of the Off Peak
15 deliveries and the Off Peak price.

16 *Q. How often is the charge updated?*

17 A. Since the IE charge is based on a variable index, the charge will change as the index is
18 updated. In this case, the referenced index is the Dow Jones Mid-Columbia Firm index,
19 which is updated daily. Therefore, the charge will be updated daily.

20 *Q. What is the IE service charge?*

21 A. Under the existing PNCA, a service charge is incurred when IE is returned in an hourly
22 shape other than the hourly shape in which it was delivered. This service charge
23 recognizes that the value of energy is different over the hours in a day and that the party
24 delivering IE in a different shape has provided shaping services.

1 Q. *Is there a need for the IE service charge?*

2 A. No. The hourly Dow Jones Mid-Columbia Firm index captures the variation in value
3 during the day and eliminates the need for IE service charges. If IE is delivered during
4 on-peak hours, the rate per megawatt hour charged for the IE would reflect the higher
5 value. Therefore, the parties have eliminated the service charge.

6 Q. *Does this conclude your testimony?*

7 A. Yes.

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1 **Attachment A**

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3 All terms contained herein have the meaning accorded them in the PNCA. This rate
4 schedule is to be effective upon approval by the Federal Energy Regulatory Commission
5 (interim or final) and will remain in effect until a revised rate is approved and becomes
6 effective.

7 A. IE Imbalances For Other Than Loaned IE

8 1. Initial Deliveries of IE

9 This charge applies to IE delivered from BPA to another PNCA party. The
10 calculation is as follows:

11
12 Formula 1

13
$$C = (ID_{ON} * I_{ON}) + (ID_{OFF} * I_{OFF})$$

14 Where for each day:

15 C = Daily charge for the Initial Deliveries of IE in dollars.

16 ID_{ON} = The Initial Delivery of IE made during the day during On Peak
17 hours in megawatt hours.

18 I_{ON} = The Dow Jones Mid-Columbia Firm index price for On Peak
19 hours in dollars per megawatt hour.

20 ID_{OFF} = The Initial Delivery of IE made during the day during Off Peak
21 hours in megawatt hours.

22 I_{OFF} = The Dow Jones Mid-Columbia Firm index price for Off Peak
23 hours in dollars per megawatt hour.

24 Note: Initial Deliveries of IE on Sunday or a NERC- [or its successor
25 organization(s)] recognized holiday are priced at the Off Peak rate.

1 2. Return of IE

2 This charge applies to the return of IE that was initially delivered to BPA from
3 another PNCA party. The charge is based on a calculated average price, unique to
4 each PNCA party that had previously supplied BPA with IE. The calculation is as
5 follows:

6
7 Formula 2

8 $C_{\text{PARTY}} = \text{IER}_{\text{PARTY}} * R_{\text{PARTY}}$

9 Where for each (PNCA) Party for a given day:

10 $C_{\text{PARTY}} =$ Daily charge for the return of such PNCA party's IE in
11 dollars.

12 $\text{IER}_{\text{PARTY}} =$ The quantity of Interchange Energy returned to a PNCA party
13 on a day in megawatt hours.

14 $R_{\text{PARTY}} =$ The applicable IE return rate for the PNCA party for the
15 given day as calculated in Formula 3 below in dollars per
16 megawatt hour.

17
18 Formula 3

19 $R_{\text{PARTY}} = \sum C_{\text{PARTY}} \div \sum \text{IER}_{\text{PARTY}}$

20 Where for each (PNCA) PARTY for a given day:

21
22 $R_{\text{PARTY}} =$ the IE return rate calculated for the PNCA party as of the given
23 day in dollars per megawatt hours.

24 $\sum C_{\text{PARTY}} =$ the net of all IE imbalance payments made by BPA to such
25 PNCA party and all payments received by BPA from such
26

1 PNCA party from the date of the last cash out of IE Imbalances
2 to the date BPA returns the IE, in dollars.

3 $\sum \text{IER}_{\text{PARTY}}$ = the net of all IE BPA has received from such PNCA party and the
4 IE returned by BPA to such PNCA party from the date of the last cash out of
5 IE Imbalances to the date BPA returns the IE, in megawatt hours.

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