INDEX

TESTIMONY OF

MARK E. MILLER, SYDNEY D. BERWAGER, CARL T. BUSKUHL,
HARRY CLARK, AND S. STANLEY KUSAKA

Witnesses for Bonneville Power Administration

SUBJECT: Cost-Based Indexed Rate Options

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Section 1. Introduction and Purpose of Testimony

Q. Please state your name and qualifications.

A. My name is Mark E. Miller. My qualifications are contained in WP-02-Q-BPA-50.

A. My name is Sydney D. Berwager. My qualifications are contained in WP-02-Q-BPA-03.

A. My name is Carl T. Buskuhl. My qualifications are contained in WP-02-Q-BPA-09.

A. My name is Harry Clark. My qualifications are contained in WP-02-Q-BPA-12.

A. My name is S. Stanley Kusaka. My qualifications are contained in WP-02-Q-BPA-39.

Q. What is the purpose of your testimony?

A. The purpose of our testimony is to describe the purpose and the structure of the proposed cost-based indexed Industrial Firm Power (IP) rate option for BPA's direct service industrial (DSI) customers. This testimony also contains a description of the cost-based indexed Priority Firm Power (PF) rate product that BPA is proposing for use by its preference customers.

Q. How is your testimony organized?

A. Our testimony is organized into five sections. Section 1 is this introduction. Section 2 discusses the reasons for offering a cost-based index IP rate option and describes the proposal. Section 3 discusses the rate parameters contained in the cost-based index IP rate. Section 4 contains a discussion of BPA's aluminum price forecast and BPA's strategy for hedging the risk associated with offering a cost-based index IP rate tied to

world aluminum prices. Section 5 contains the testimony concerning the cost-based index for sales under the PF rate schedule.

Section 2. Purpose and Description of the Cost-Based Indexed IP Rate

Q. What is the cost-based indexed IP rate?

A. "Cost-based indexed IP rate" (or "indexed rate") refers to a product similar to the variable industrial rates that BPA has adopted in past rate cases, and that is designed to recover revenues over the term of the indexed rate equal to or greater than the standard IP rate.

Q. What are the benefits of an indexed rate for the DSIs?

A. The primary purpose of the indexed rate is to offer the DSIs with aluminum smelter operations a tool that should promote smelter survivability during periods of low aluminum prices, while providing BPA with the revenues necessary to recover its costs. As discussed in our testimony, BPA believes that a conservatively structured indexed rate, that does not place unreasonable levels of additional cost risk on other customers, will provide an important short-term survival tool for DSI smelters. Inasmuch as electricity costs constitute approximately 30 percent of smelter production costs, an indexed rate should help enhance the ability of smelters to operate in FY 2002-2006 during periods of low aluminum prices.

Q. Why is an indexed rate needed at this time?

A. Some DSIs have indicated that the availability of an indexed rate, in the event aluminum prices do not recover during the next rate period, will likely be important to their decision to maintain the operation of some of the plants. Several factors led BPA to believe that these concerns regarding DSI survivability are credible. These are discussed in the testimony of Berwager, *et al*., WP-02-E-BPA-09. BPA believes continued DSI operations, and the jobs created by these operations, are important to the region and, in particular, for those communities in the region that depend on continued smelter operation for economic support. BPA's proposal for service to the DSIs promotes

continued operations in two ways. First, the proposed IP Targeted Adjustment Charge (IPTAC) makes significant amounts of power available to the DSI's at a price that is expected to be considerably less than market. And second, the indexed rate adds a complementary option for those DSIs that are concerned about dealing with shorter-term swings in the price of aluminum.

Q. *How many DSI aluminum smelters are there, and how many people are employed at those smelters?*

A. There are ten aluminum smelters and one rolling mill in the Pacific Northwest being directly served by BPA power. At full operations, these eleven plants directly employ close to 10,000 workers.

Q. *Please describe the structure of the indexed rate.*

A. The indexed rate is a mechanism in which the price of power is linked to aluminum prices as measured by the London Metals Exchange (LME) for their three-month aluminum contract denominated in US dollars. The indexed rate being proposed is similar to the variable industrial power rates that BPA adopted in past rate cases. The indexed rate has been designed around rate and aluminum price parameters so that, on a projected basis, BPA will recover revenues equivalent to revenues it would recover under the IPTAC rates. For most aluminum DSI customer load, the IPTAC is 23.5 mills/kWh. *See* Berwager, *et al.*, WP-02-E-BPA-09. The proposed IPTAC rate is set at a level so that BPA may offer the DSIs a rate that enhances their ability to continue operations at a high production level without causing increases in BPA's rates for other customers.

Q. *Please elaborate.*

A. As designed, the indexed rate will have both a maximum (upper rate limit) and minimum (lower rate limit) power rate. The proposed upper rate limit is 28.50 mills/kWh, 5 mills/kWh higher than the IPTAC of 23.5 mills/kWh, and will be in force whenever the monthly price of aluminum is calculated to be at or above the corresponding aluminum

price cap (upper pivot point) of 74 cents/lb. The proposed lower rate limit is 19.0 mills/kWh, 4.5 mills/kWh lower than 23.5 mills/kWh, and will be in force whenever the monthly price of aluminum is calculated to be at or below the corresponding aluminum price floor (lower pivot point) of 62 cents/lb. The slope is the rate at which the electric price increases as aluminum prices increase. On average, the slope is approximately 0.8, i.e., 0.8 mills/kWh for every 1 cent per pound increase in aluminum prices. More precisely, as aluminum prices increase off the floor up to an aluminum price of 68 cents/lb, the slope is 0.75. Once aluminum prices exceed 68 cents/lb, the slope is 0.83. The indexed rate will be adjusted on a monthly basis corresponding to changes in the LME aluminum prices.

The parameters of the indexed rate are built around the proposed IPTAC rates to provide a high probability that revenues will equal the applicable IPTAC rates, on average, over the rate period. The derivation of these rate parameters is discussed further later in our testimony.

Q. Please briefly describe the IPTAC rates you mentioned.

A. There are two IPTAC rates, one for the DSI customers that agreed to support the Compromise Approach, and another for those that did not. Essentially, the IPTAC rates combine the allocated costs of Federal Base System inventory with the costs of purchasing additional power used to provide service to the DSIs. The proposed IPTAC rate for supporters of the Compromise Approach is 23.5 mills/kWh, and 25 mills/kWh for nonsupporters. *See* Berwager, *et al*., WP-02-E-BPA-09; Doubleday, *et al.*, WP-02-E-BPA-18.

Q. Please explain how an indexed rate can help DSI smelters continue operations.

A. Energy prices are only one factor in determining an individual plant or producer's ability to compete. Other factors such as material costs, debt service, and labor costs also play an important role. Thus, the price of electricity, especially the short-term price of

electricity, cannot and is not intended to guarantee DSI aluminum plant survivability. However, because the aluminum smelters are exposed to aluminum price swings, at a flat 23.5 mills/kWh energy rate there may be times during the rate period when aluminum prices, and therefore smelter revenues, drop below some smelters' operating costs. With an indexed rate there is a higher likelihood a smelter's operating margin will at least cover its short-term operating costs during periods of low aluminum prices. With this type of rate, when the price of aluminum increases or decreases so will the price of power (which represents about 30 percent of smelter operating costs), within certain limits. By providing a tool to cope with short-run downturns in commodity prices, the indexed rate should encourage long-term commitments to Northwest plant operations.

Q. Please elaborate.

A. Aluminum is a commodity with volatile price swings. Recent historical prices indicate prices can range from a low of 50 cents to $1.00 per pound. Aluminum smelters are power intensive, with about 30 percent of aluminum production costs attributable to electricity. The average Pacific Northwest aluminum smelter has a power efficiency use of about 7.5 kilowatthours to make one pound of aluminum. Thus, every change of one mill in power price results in a 0.75 cents change, up or down, in aluminum production costs. This means that for the average Pacific Northwest smelter, the difference between power priced at 23.5 mills/kWh and 19.0 mills/kWh (the proposed lower rate limit) means a production cost reduction of 3.4 cents/lb. Allowing electricity prices to follow aluminum prices therefore has a marked impact on a smelter's ability to cover its short-term operation costs during periods of low aluminum prices.

Q. Is the indexed rate mandatory?

A. No, the indexed rate is an optional rate. At the time a DSI signs its new power sales contract, each DSI will make a choice whether to take service under the indexed rate

design or under the applicable flat IPTAC rate. Each aluminum company's election will apply to all its smelter load served by BPA for the term of the rate period.

Q. Will an indexed rate be available to the nonaluminum DSIs?

A. Yes. An indexed rate will be available to the nonaluminum DSIs, if BPA and the company can mutually agree to an appropriate industry or commodity index. The reason for offering a non-aluminum index rate is to provide nonaluminum DSIs a tool to aid their survival during times of low product prices. The resulting average rate collected over the period will have to recover the same revenue values as the applicable IPTAC rate.

Q. What attributes will BPA require in a nonaluminum industry or commodity index?

A. Such an index will have the following attributes: (1) it must represent a commodity in which there is sufficient competition and price transparency, evidenced by a commercially recognized price index; (2) the pricing methodology employed in the index must rely on multiple producers; (3) the index must be used commercially to set settlement terms between producers and consumers; and (4) the index must be capable of use for establishing longer term prices and for hedging.

Q. Is the indexed rate available to DSIs that did not sign on to the Compromise Approach?

A. Yes. The indexed rate will be available, but the design will be different. For those DSIs who did not commit to supporting the Compromise Approach, the cost-based index rate electricity price will be 1.5 mills/kWh higher at all aluminum prices. However, we are proposing that the pivot points (defined in terms of aluminum prices) be the same for this product as for the 23.5 mills/kWh product available to the DSI customers supporting the Compromise Approach. The Compromise Approach is described in more detail in the testimony of Berwager, *et al*., WP-02-E-BPA-09.

Q. Can a DSI shift back and forth between the indexed rate and an IPTAC rate?

A. No. In order to avoid a customer choosing the indexed rate when it provides a lower price than the applicable IPTAC rate, and choosing the IPTAC rate at other times, each company will have to make a one-time election--at the time it signs a power purchase agreement with BPA--that will apply for the term of the rate period. Otherwise, there would be no way to reasonably project a revenue stream equal to the applicable IPTACrate over the course of the rate period.

Q. Are there other reasons for requiring the one-time election?

A. Yes. The indexed rate option presents some revenue uncertainties for BPA due to potentially unstable or low aluminum prices. Therefore, it is necessary that BPA have the ability to simultaneously protect expected revenues by hedging against this risk. In order to do this successfully, BPA must be confident that a power sales contract with an indexed rate will remain in force for a fixed term with pricing tied to a specific index. BPA's hedging strategy for indexed rate service to the DSIs is discussed more fully later in this testimony.

Q. Is the indexed rate proposal different from the variable industrial power rate BPA proposed and adopted in the 1996 rate case (VI-96)?

A. It is similar but not identical. In the 1996 rate case, BPA presented an indexed rate concept specifically designed to be backed by the financial market on a transaction-by-transaction basis. That is, if a smelter wanted an indexed rate, BPA would have found a financial partner to design a custom indexed rate for the smelter, depending on their specific power needs. Under VI-96, the concept was to allow the financial partner to use the most current financial forward price in setting indexed rate parameters on a smelter-by-smelter basis.

Q. Could you give an example?

A. For example, if a smelter in 1996 wanted a BPA indexed rate from FY 1996-2001, BPA would seek bids from financial institutions to hedge the revenue risk to BPA. The financial institution would develop a forward aluminum price curve, which would indicate what the actual market is willing to pay for aluminum during the term of the variable rate contract. If, for example, the forward aluminum price curve was 70 cents/lb, then, in 1996, the financial institution would know that they could buy and sell aluminum futures in the FY 1996-2001 market for 70 cents/lb. Then, the financial institution could "build" a power index rate for the smelter around 70 cents/lb. In this way, the financial institution could hedge its risk exposure to changes in aluminum prices so that they could back the smelter's indexed power rate.

Q. How does this differ from the proposed indexed rate?

A. With the currently proposed index rate, BPA first obtains aluminum price forecasts for the rate period and the forward transaction price curve from the financial market. BPA is proposing to build the power indexed rate parameters around a 68 cents/lb aluminum price forecast, heavily weighted toward the forward aluminum transaction price curve. This enables BPA to be confident that it can lock in a fixed price rate very close to the base 23.5 mills/kWh for all power sold to the smelters because the financial market is willing to guarantee the forward aluminum price curve. Thus, BPA is also effectively managing the risk of fluctuating aluminum prices.

In summary, the proposed power indexed rate is similar in concept to the VI-96 rate. Both are designed to offer the smelters an indexed rate to help mitigate the risks due to low aluminum prices, while providing BPA confidence the applicable average base IPTAC rate will be collected from smelter power sales.

Section 3: Rate Parameters

Q. Please describe each of the separate parameters of the proposed indexed rate.

A. The indexed rate contains five separate rate parameters: a lower and upper rate limit, an upper pivot point and a lower pivot point, and a slope. The pivot points are the points at which the price of electricity transitions between fixed and variable in response to aluminum market prices. The lower pivot point is the point at which a further increase in the market price of aluminum results in an increase in the electricity price, and the upper pivot point is the point at which a further decrease in the price of aluminum results a decrease in the electricity price. The rate limits establish the range of possible electricity prices under the indexed rate. Thus, the lower rate limit (19 mills/kWh) is the lowest possible electricity price. The upper rate limit (28.5 mills/kWh) is the highest possible electricity price. The slope is the rate of change in the power price to the DSI as a function of the change in the market price of aluminum.

Q. Please explain how the upper and lower rate limits were set.

A. The indexed rate parameters were designed to create a high probability of collecting revenues equivalent to the IPTAC rates of 23.5 mills/kWh and 25.0 mills/kWh over the five-year rate period. A lower rate limit of 19 mills/kWh was selected to limit the risk that BPA would under-recover revenues during this period. During the past ten years, there have been periods when aluminum prices have dropped below 60 cents/lb. An indexed rate that provided for electric rates lower than 19 mills/kWh would have BPA undercollecting by 5 mills/kWh or more during those market conditions. Furthermore, a 19-mill lower limit controls the degree to which even temporary prices to the DSIs could drop below the section 7(c)(2) IP floor rate or the PF rate available to BPA's public preference customers. On the other hand, if the lower limit was higher, it would lose its value as a tool for the smelters to cope with periods of low commodity prices. With a lower rate limit 4.5 mills/kWh lower than 23.5 mills/kWh, a forward aluminum price

averaging 68 cents/lb, and an upper rate limit 5 mills/kWh higher than 23.5 mills/kWh, the cost-based indexed rate provides reasonable assurance of projected revenues of 23.5 mills/kWh on average.

Q. What basis was used to determine the lower and upper pivot points?

A. Using input from financial institutions offering hedging products, BPA designed the indexed rate, including the pivot points, with a primary objective of recovering 23.5 mills/kWh on average over the rate period. Discussions with aluminum smelters on what pivot points and what rate levels they needed to help them survive possible low metal prices influenced the final design. Using an average aluminum price of 68 cents/lb with pivot points 6 cents higher or lower, BPA achieved an indexed rate design that can be hedged by the financial community. Under this construct BPA will be able to recover the 23.5 mills/kWh base rate, mitigating any exposure to a lower average rate due to aluminum price swings.

Q. Why is the average slope equal to 0.8 mills/kWh change in the rate for each 1 cent per pound change in the aluminum price?

A. As noted previously, when examining the slope in detail, it consists of two slightly different slopes which average to approximately 0.8 mills/kWh change in the power rate for each 1 cent per pound change in the aluminum price. The slope of the indexed rate was directly the subject of negotiations between BPA and the DSIs. As a part of negotiations, BPA sought and received forward transaction prices for the contract period (FY 2002-2006). These prices, which ranged between 66 and 67 cents/lb during the period in which BPA was developing this proposal, were measured against both current prices and forecasts of prices for the contract period. Given that prices at the time were around 61 cents/lb, and that forecasted prices were around 72 cents/lb to 75 cents/lb, BPA settled on a slope that was roughly bounded by these variables (62 cents/lb lower pivot and 74 cents/lb upper pivot).

In the 1986 BPA variable rate, the lower slope had a ratio of 1 mill rate change to every 1 cent change in aluminum price. In practice, however, many smelters complained that this 1:1 ratio slope was too steep. This is because in the long term, most alumina (supply) contracts are designed around alumina priced at 12.5 percent of metal price. It also takes two pounds of alumina to make one pound of aluminum. Thus, if a smelter also has an indexed alumina price, a 1 cent change in metal price results in a 0.25 cent change in alumina production costs (12.5 percent of metal price times two pounds of alumina needed to make one pound of metal).

As mentioned previously, the typical Pacific Northwest smelter also has an average power efficiency of 7.5 kilowatthours per pound. Thus, if the slope of the indexed electric rate is 1 mill for every 1 cent change in metal price, the typical Pacific Northwest smelter would have a 0.75 cent change in production costs for every 1 cent change in aluminum prices. If that smelter also had a typical 12.5 percent alumina supply contract, then the increase in production costs would be 0.75 cent change in power production costs, plus an additional 0.25 cent change in alumina production costs. In this case, there would be no smelter benefit from an increase in aluminum prices. Thus, to preserve some benefit to the companies from a rise in aluminum prices, the slope for this new indexed power cost is flatter than the 1:1 ratio.

Section 4: Forward Aluminum Prices, Revenues, and Hedging Strategy

Q. What sources of information did BPA consider when developing its aluminum price of 68 cents/lb for the FY 2002–2006 period?

A. BPA studied various sources of information including commercially available aluminum industry consultant market forecasts, which are proprietary, and long-term aluminum price trends. BPA also studied various financial swap quotes, commonly referred to as “forward price” quotes. These "forward price" quotes are not market forecasts like those available commercially from aluminum industry consultants. Forward price quotes are

the prices at which aluminum can be bought or sold for the period in question. Therefore, if BPA chose to lay off or "hedge" some or all of its aluminum price exposure, it could use this forward market to do so. Setting the aluminum price in the indexed rate structure close to this quoted value, which was approximately 67 cents/lb at the time the Compromise Approach was negotiated, instead of a value based on other forecasts allows BPA to hedge its position at a lower cost.

Q. Please explain the differences between the various aluminum price forecasts.

A. There are basically three different types of aluminum price "forecasts." A commercial aluminum industry consultant's forecast is usually the result of their assumptions about the future, quantified by a model. For example, a consultant might assume a 2 percent growth in aluminum used in automobiles, 3 percent growth in beverage cans, etc. Combining all these assumptions plus their forecasts for smelter capacity, the consultant derives a supply and demand curve for aluminum in the future. These supply curves then generate an aluminum price forecast. Generally, these types of forecasts are most accurate in the short-term, and are a fair indication of short-term aluminum price swings.

The other "forecast" is the long-term aluminum price trend. This forecast essentially reflects the cost of manufacturing aluminum from newly-built smelter capacity. As time goes on, if aluminum is still a viable commodity compared to steel, plastics, etc., then the world market must be willing to pay the price of aluminum produced from new smelter capacity to meet future demand. This price is currently thought to be 70-75 cents/lb.

The third "forecast" is the financial forward aluminum price, which was approximately 67 cents/lb at the time BPA formulated this proposal. This is the tangible and real price that the market is currently willing to buy and sell aluminum in the FY 2002-2006 time period. In this sense, this is not a "forecast" like the others mentioned. The other "forecasts" are predictions, which nobody will guarantee. That is,

industry consultants may forecast aluminum prices of 75-80 cents/lb, and the long-term aluminum price trend may be thought to be 70-75 cents/lb during the FY 2002-2006 time period. However, nobody will guarantee these prices during the FY 2002-2006 time period. The financial forward aluminum price of 67 cents/lb is different, in that the financial market will guarantee at a specific point in time to either buy or sell aluminum at 67 cents/lb during FY 2002-2006.

Q. Is it your testimony that the aluminum industry consultant's forecast for FY 2001-2006 is 75-80 cents/lb, and also that the long-term trend is 70-75 cents/lb?

A. We have stated these "forecasted" aluminum price levels only as examples. We are not sponsoring testimony that necessarily claims that the consultant's forecast is 75-80cents/lb, and the long-term trend forecast is 70-75 cents/lb. Although this may not be far from the actual forecasted levels, we could have used other price levels in our examples. We are only sponsoring testimony that a recent financial forward aluminum price is 67 cents/lb, which forms the basis of the proposed indexed rate.

Q. Why did BPA settle on 68 cent/lb as an appropriate price for the indexed rate?

A. In developing the indexed rate, BPA had to include several risk management considerations. These considerations focused on a diverse range of financial, rate, and policy issues, including:

- BPA's ability and resources to manage aluminum price commodity risk;
- the potential impact to non-DSI customer rates from the risks associated with an indexed rate;
- the design of the rate itself, particularly the point at which the aluminum price/power rate would be equal to BPA's cost of service (i.e., expected value); and
- BPA's inclination to carry added risk in a period of already increasing risk elsewhere.

Given these issues, BPA sought two kinds of price data to construct the indexed IP rate proposal: (1) aluminum price forecasts; and (2) the actual forward transaction price. Both were based on the period October 1, 2001, through September 30, 2006. As noted above, the forward transaction price is an *actual* value, where a forecast is an *expected* one. Most commodity forecasts will be slightly or somewhat higher than the actual transaction price quote; moreover, forecasts are, to varying degrees, always wrong. If BPA chose to construct its indexed IP rate around a higher-priced aluminum forecast, the aluminum price at which BPA's proposal was centered correspondingly would be higher. However, BPA heavily weighted a forward transaction price quote of approximately 67 cents/lb in developing the indexed rate, because doing so provides additional confidence that BPA will recover, on average, the IPTAC rates over the rate period.

Q. Please elaborate.

A. BPA chose to heavily weight the forward transaction price for several important reasons. These included:

- An analysis of BPA's risk profile during the coming rate period indicate greater revenue variability;
- the addition of an indexed IP rate has been identified as intensifying revenue variability; and
- BPA has identified several risk strategies, all of which indicate BPA would reduce its risk by converting the DSI indexed rate to a fixed price equivalent.

Because it is BPA's intention to convert or hedge any indexed rate power contract back to a fixed price equivalent, using the currently available transaction price instead of a forecast was viewed as a more prudent approach. Such an approach results in BPA more closely approximating or matching its cost of service when compared with the use of more optimistic predictions of future aluminum prices.

In recent times there seems to be downward pressures to the accepted concept of a long-term aluminum price of 70-75 cents/lb per pound. Since new smelters are very expensive, aluminum companies have resorted to more expansions at existing smelters rather than building more expensive brand new smelters, which can necessitate brand new accompanying infrastructures, such as roads, terminals, etc. Brand new smelters today must also comply with tougher environmental standards, and thus are very costly. The recent years of low aluminum prices have also forced smelters to cut costs and become more economical to survive. In addition, with increased world competitiveness in the industry, there are trends to become more efficient in both supply and production costs, including labor.

Although there are indications that the longer term aluminum prices may actually be lower than 70-75 cents/lb per pound, we believe that 70-75 cents/lb could still be a reasonable long-term aluminum price figure. We also believe that the aluminum price cycle is volatile and so, even if BPA believed it was a reasonable price, there is no assurance aluminum prices would actually be in the 70-75 cent range during the rate period. Thus, there would be risks involved in setting the indexed rate parameters to 70-75 cents/lb. To compensate BPA for the risks that the aluminum prices would not average 70-75 cents/lb, BPA will include a risk premium to offset the risks involved. This is standard commercial practice, and as a prudent business practice, BPA must identify and offset risk. Since BPA will guarantee the final indexed rates parameters for five years, BPA must also have confidence that it will charge an appropriate risk premium to cover the volatility of the aluminum market during FY 2002-2006. This risk premium results in moving BPA's rate parameters down into the range of the forward transaction price of 67 cents/lb.

At the time BPA agreed to propose an aluminum price of 68 cents/lb, the financial market would guarantee a forward aluminum price curve of just under 67 cents/lb. This

indicates that even if the financial market also believes in the average long-term aluminum price of 70-75 cents/lb in FY 2001-2006, it must include a risk premium when offering a fixed forward aluminum price. In an attempt to establish indexed rate parameters that enhance the prospects for smelter survivability, BPA is willing to accept the very modest risk associated with continuing low aluminum prices, and thus chose to propose an indexed rate that works off a 68 cent aluminum price, slightly higher than current forward price quotes. This is in keeping with BPA's intention that the indexed IP rate will not create additional significant risks and thus will not increase BPA's other customers' rates.

Q. Please describe the revenue risks to BPA presented by the indexed rate option.

A. There is a risk that low aluminum prices could occur for an extended time during the rate period. If such an event occurs, BPA could recover less average revenues than were forecasted for the five-year rate period. This revenue under-recovery could be up to $11.7 million/year for every mill below the forecasted average rate. In light of BPA's current risk mitigation plan, however, and the upward movement of aluminum swap quotes provided by the financial institutions, very little revenue risk is created by the indexed rate. Moreover, BPA set the upper rate limit 5 mills/kWh higher than 23.5 mill (as opposed to the lower rate limit being 4.5 mills/kWh below the average rate) in order to create upside revenue potential for BPA if aluminum markets proved to be good.

Q. Does this conclude your testimony concerning the indexed IP rate?

A. Yes it does.

Section 5: Cost-Based Indexed PF Rate

Q. Please describe the cost-based indexed PF rate.

A. The cost-based indexed PF rate is a rate conversion from the applicable PF rate to a market-indexed or floating price. The rate indexed to market would not be fixed but

would rise and fall with market prices, although it is adjusted for BPA's risk and designed to achieve revenues equivalent to the applicable PF rate.

Q. Why is BPA offering customers a cost-based indexed rate?

A. There are several reasons why BPA is offering the cost-based indexed PF rate. First, it extends BPA's ability to offer pricing flexibility to its customers related to the market. Like the Flexible PF rate, the cost-based indexed PF rate allows BPA to better tailor the rate to reflect the risks associated with the market. Third, it is an alternative to take-or-pay contract provisions since the customer assumes the market risks. Finally, it provides a product alternative to the customer's end-use consumers, particularly industrial and large commercial loads, seeking market-based electric rates.

Q. How will this rate be structured?

A. During contract negotiations the customer may request the cost-based indexed PF rate. It is however in BPA's discretion to offer this product. Assuming it is available however, BPA and the customer will then mutually agree on either a commercially viable cash index or a futures index with which to reference the rate price. For example, the California-Oregon border (COB) Dow Jones cash indexes or the New York Mercantile Exchange futures contract at COB, or some other commercially recognized combination may be used to arrive at an agreed upon index. If a cash index is chosen, BPA will use that index to establish the monthly settlement price for the customer's power bill. If a futures index is chosen, BPA will set the index price based on a monthly settlement formula taken from that index. Whichever kind of index is used, the monthly price for power will be set based upon a negotiated formula for calculating price. Such formula may be either a single expiration price, a monthly average, or some other average of the month's prices.

Q. How is the cost-based indexed PF rate designed to achieve revenues equivalent to the applicable PF rate?

A. Because BPA will base the index pricing on a current market forecast of the market index referenced, BPA will adjust the current market price over the contract period against BPA's cost. This may result in either a discount or premium that will be applied to the calculation of each month's bill. In addition, BPA will add a hedging or insurance cost. Such insurance, in the event market prices are below BPA costs, may consist only of the premium or difference between cost and market. If, on the other hand, market prices are above BPA costs, such insurance may reduce the amount of any monthly discount applied to a customer's power bill. The expected Net Present Value (NPV) revenue of the forecast index prices will be adjusted by a HLH and LLH Market Index Monthly Adjustment (MIMA) to equal the expected NPV of the applicable PF rate.

Q. Please describe the MIMA.

A. The MIMA is the difference between cost and market for power in both HLH and LLH periods indexed and adjusted monthly. In the case of a discount to market, MIMA includes the added cost of price insurance. The MIMA is calculated at the time of contract origination and remains effective throughout the life of the contract. MIMA essentially allows BPA to mark an index contract up or down from market prices, and back to BPA's cost, based on the current forward market transaction price. By doing this the forecasted revenues will be equal to revenues under the posted PF rates.

Q. What is the duration for the cost-based indexed PF rate?

A. Customers can elect to apply this rate up to five years. Customers who elect a contract length of less than five years and wish to renew will be subject to rates established under a new rate case and the recalculation of the MIMA.

Q. What are the risks presented by the cost-based indexed PF rate?

A. Unlike its fixed price counterpart, the price for power sold under contracts subject to the cost-based indexed PF rate will change with the market. Because of market volatility prices range across a wide area. Therefore, the risk inherent in the cost-based PF rate could be great. For BPA, the risk is that market prices will fall, resulting in a below-cost price. For customers, the risk is that prices will rise, resulting in a higher price than they would have paid at a fixed PF rate.

Q. What, if anything, can BPA do to protect itself from the inherent risks of the cost-based indexed PF rate?

A. To protect itself from under recovering system costs, BPA will use risk management tools, such as put options, to protect such contracts. The cost of such insurance will be a reduction to any discount when market prices are above the PF rate at the time a contract is signed. If market prices are below the PF rate, then BPA will add an appropriate premium to the monthly calculation of the settlement price (*see* above discussion of MIMA). The settlement price is based on a mutually-agreed to formula that calculates an average based on some certain number of days within the delivery month, e.g., average of last 15 days in the delivery month. BPA may also use index-type transactions of this kind to protect itself against higher-than-PF market purchases.

Q. Is this adjustment available under the Slice Product as indicated in the Initial Proposal Rate Schedules?

A. No. It was incorrectly shown as being available.

Q. Does this conclude your testimony?

A. Yes it does.