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May 15, 2003

Mr. Ray Aldeguer  
Senior Vice-President  
Corporate Resources & General Counsel.  
British Columbia Hydro and Power Authority  
333 Dunsmuir Street  
Vancouver, B.C. V6B 5R3

Dear Mr. Aldeguer:

Re: British Columbia Hydro and Power Authority ("B.C. Hydro")  
Proposal regarding a Heritage Contract, Stepped Rates and Access Principles

Further to B.C. Hydro's April 30, 2003 Proposal Regarding a Heritage Contract, Stepped Rates and Access Principles, please provide answers to the questions as set out on the attached BCUC Staff Information Request No. 1, by Thursday, May 29, 2003. Please also provide your response in electronic format for use by Commission staff.

This material and the response thereto, is to be distributed to registered intervenors.

Yours truly

*Original signed by:*

James W. Fraser  
Manager, Strategic Services

JWF/rt  
cc: Registered Intervenors

BRITISH COLUMBIA UTILITIES COMMISSION  
Staff Information Request No. 1

**British Columbia Hydro and Power Authority**  
**Proposal Regarding a Heritage Contract, Stepped Rates and Access Principles**

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**VOLUME 1: THE HERITAGE CONTRACT PROPOSAL**

**Executive Summary**

1.0 Reference: Volume 1, Executive Summary, page vi

BC Hydro's proposal states:

“(2) The Heritage Contract proposal should drive economically efficient decisions at the margin for supply, demand, and trade;”

1.1 Are the decisions referred to in this principle limited to decisions to be made by BC Hydro to meet the load requirements of end-use customers? Are there decisions to be made by Powerex that are relevant to this principle? Please explain.

1.2 What demand decisions are impacted by the Heritage Contract proposal?

2.0 Reference: Volume 1, Executive Summary, page vi

BC Hydro's proposal states:

“(3) The Heritage Contract proposal should be as simple and understandable as possible so that economic incentives will be clear to all participants;”

Given the scope of the Heritage Deferral Account, please explain in detail the economic incentives that are being referred to in this principle. What is the intended purpose of those economic incentives? Who are the participants?

3.0 Reference: Volume 1, Executive Summary, page vi

BC Hydro's proposal states:

“(4) To maximize system value, those operating the system and those buying and selling power from and for the system should have, to the greatest extent possible, unfettered communications”

Please describe the terms of the Heritage Contract that were influenced by this principle. What provisions of the Heritage Contract might fetter communications?

4.0 Reference: Volume 1, Executive Summary, page vii

BC Hydro's proposal states:

“A corollary of that implication is that the benefits should be realized by customer classes, as opposed to individual customers.”

4.1 Does BC Hydro propose that the benefits be allocated by customer class rather than be conferred to the distribution business? What are the implications of an allocation by customer class?

4.2 Please explain how Heritage Contract benefits will be allocated to each class in the event that load growth for the different customer classes is not the same over time. In such an event, would BC Hydro propose to redistribute the benefits that have been allocated by customer class?

## **Chapter 2: The Heritage Contract Proposal**

5.0 Reference: Volume 1, Chapter 2, p. 7

BC Hydro's proposal states:

“Finally, the proposal recommends establishing a deferral account designed to mitigate the volatility of BC Hydro's revenue requirements that may arise from its payment obligations under the Heritage Contract or from its receipt of Trade Income (Heritage Deferral Account).”

Does the deferral account include an adjustment for “Trade Income”? If so, please add a line on Appendix E: Illustration of Heritage Deferral Account to illustrate the treatment of Trade Income. If not, please describe how trade income benefits to ratepayers will be incorporated into, or offset against the revenue requirement.

6.0 Reference: Volume 1, Chapter 2, p. 7

BC Hydro's proposal states:

"Each of these components is interdependent, and changes to one will require changes to others. Thus, the components of the proposal ought to be understood as a comprehensive package."

- 6.1 Please explain the interdependencies and changes that BC Hydro would want to make with each of the following changes to individual components:
  - a. a fixed price contract; and
  - b. a cost of Heritage Energy forecast annually with the risk of the forecast borne by BC Hydro.
- 6.2 Please provide the detailed calculations of a price for a fixed price contract escalated at CPI-BC and the fixed quantity of Heritage Energy as defined in the proposal.

7.0 Reference: Volume 1, Chapter 2, p.7

Please describe the process or framework by which BC Hydro Generation will at all times "ensure priority is given to the needs of BC Hydro Distribution."

8.0 Reference: Volume 1, Chapter 2, page 8

- 8.1 The maximum quantity of "Heritage Energy" is proposed to be set at 49,000 GWh per year. How does this compare with current and projected domestic load?
- 8.2 On page 9 it is assumed that BCH Distribution will take all of the Heritage Energy. If less energy was taken, would the decrement be "bankable"?
- 8.3 Is the 49,000 GWh per year to be adjusted annually? If so, what factors will be taken into account (e.g., depletion of capacity)?

9.0 Reference: Volume 1, Chapter 2, page 8

In the first paragraph BC Hydro states that "The Heritage Contract will also allow coordination with other resources under BC Hydro's control."

- 9.1 What other resources is this sentence referring to?

9.2 What are the benefits of the coordination referred to?

9.3 What kind of coordination is necessary or desirable?

10.0 Reference: Volume 1, Chapter 2, page 8

The report states that the maximum energy delivery obligation is proposed to be set at 49,000 GWH/year, which is derived from an examination of the historic and future expected use of the Heritage Resources under average water conditions.

10.1 How is “average water” defined?

10.2 What time period was used for examining the historic capability of each of the resources? For instance, is the time period a set number of years or is it based on the life of the dam to the present day?

10.3 What factors were considered in determining the future expected use of the resources?

10.4 Please explain BC Hydro’s rationale for inclusion of all or some part of the Heritage thermal resources in the 49,000 GWH/year.

11.0 Reference: Volume 1, Chapter 2, page 8-9

11.1 What limits or constraints, if any, are proposed for the cost of the Heritage Electricity (The Heritage Payment Obligation)?

11.2 Is it intended that the cost would be reviewed separately from costs of BCH Distribution or would they be considered at the same time, in the same proceeding?

12.0 Reference: Volume 1, Chapter 2, p. 9

BC Hydro’s proposal states:

“The Heritage Contract proposal can accommodate “performance based rate-making”(PBR) mechanisms for many of the more stable and controllable cost components of the Heritage Payment Obligation.”

12.1 Assume that a PBR Plan targeted O&M expenditures. What changes would need to be made to the Heritage Contract to accommodate such a PBR Plan?

12.2 Does BCH expect that it would file a PBR Plan for some or all of the components of the Heritage Payment Obligation as part of its 2004 Revenue Requirement and Rates application?

13.0 Reference: Volume 1, Chapter 2, page 10: Trade Income Definition and Allocation

BC Hydro states that it is proposing to define Trade Income in such a way that energy transactions required to support the domestic system would be separated from transactions for trade.

In BC Hydro's letter to the Commission dated December 21, 2000, BC Hydro states that:

"It is important to note that BC Hydro and Powerex manage a *portfolio* that includes sales and purchase commitments. Once energy is purchased, it becomes part of a portfolio of resources (along with the generation capabilities of the Utility) and is managed on a dynamic basis without regard to the source of the energy. It is therefore not possible to directly attribute specific sources of energy to electricity trade compared to domestic sales." (p. 1, emphasis in original)

13.1 Please explain how BC Hydro will separate energy transactions as it proposes given the concerns expressed in its December 21, 2000 letter.

13.2 Please provide examples that illustrate the distinction between trading transactions for "domestic purposes" versus "trading activities".

13.3 Please describe the mechanism, and provide supporting data and examples where relevant, for determining the market index price paid for transactions between Powerex and BC Hydro.

13.4 Please provide a historical summary of the market index on which transactions between Powerex and BC Hydro were based over the last 10 years.

14.0 Volume 1, Chapter 2, pages 10-11

14.1 How does BC Hydro define and measure "surplus capability"? Is this different than surplus energy, and if so, how?

14.2 Does recorded energy trade include hourly transactions? Does it also include contract commitments? Please explain with reference to export/import figures reported by the NEB.

- 14.3 It is proposed that trading revenues be valued by a market index (page 10). Describe the transactions to which the index would apply and explain the construction of the index.
- 14.4 On page 10, Powerex's costs associated with use of Heritage resources are defined as "fuel costs and variable operating costs, and point-to-point transmission charges." Does this apply to both spot transactions and contract sales?
- 14.5 On page 10, BC Hydro states that transactions between Powerex and BC Hydro are not based on actual costs. To what extent will Powerex sell export energy under fixed term contracts? If so, will the embedded costs of the energy be recognized in such transactions, and if so how? If not, why not?

15.0 Reference: Volume 1, Chapter 2, page 11: Trade Income Definition and Allocation

BC Hydro states that it is proposing to change its definition of Trade Income such that surplus hydro energy is sold to Powerex at the index price (directly reducing the Heritage Payment Obligation and therefore BC Hydro's cost of energy) and the Trade Income would only reflect the profit that Powerex could make relative to the market index price.

- 15.1 Please describe the rationale for the proposed change.
- 15.2 Please indicate how the proposed change in the definition of Trade Income will impact ratepayers (Heritage Beneficiaries) as compared to the previous definition of Trade Income.
- 15.3 BC Hydro's June 30 2000 letter to the Commission and attached Report on Export Trade described the nature of transactions between Powerex and BC Hydro at that time, and the Policies agreements and protocols between BC Hydro and Powerex. Please provide a copy of that letter and the attached report.
- 15.4 Does the June 30, 2000 letter and report continue to accurately reflect the current relationship between BC Hydro and Powerex. If not, please indicate how the relationship has changed.
- 15.5 Please state how the relationship between BC Hydro and Powerex will change if BC Hydro's proposed Heritage Contract proposal is adopted by the Province?

16.0 Reference: Volume 1, Chapter 2, p. 11

“Under the proposed definition, surplus hydro energy would be sold to Powerex at the index price and the profit would directly reduce the Heritage Payment Obligation and thus effectively reduce BC Hydro’s cost of energy.”

The difference between the index price and the embedded cost price will reduce the Heritage Payment Obligation.

16.1 Although it will not be accounted for on a transaction by transaction basis, in principle, is the difference between the index price and the actual sale price either a debit or credit to the Trade Income account?

16.2 Please explain why other energy sales by Powerex utilizing Heritage resources should not be credited back in the same way as that proposed for surplus hydro.

17.0 deleted

18.0 Reference: Volume 1, Chapter 2, page 12

18.1 Please compare the workings of the proposed Heritage Deferral Account with those of the current RSA and illustrate with examples. In particular, is the shareholder's *allowed* rate of return a fixed component of the Heritage Payment Obligation?

18.2 Special Directive 8, paragraph 5, states:

“The return on equity in paragraph 4(d) must be calculated using consolidated operating income from all sources before any Rate Stabilization Account transfers, where projections of consolidated operating income include an amount of electricity trade income consistent with the Commission’s forecast of annual net export revenue under average water conditions”

BC Hydro proposes that the cost variance Heritage Deferral Account replace the Rate Stabilization Deferral Account that is based on variances from a return on equity.

Please explain what impact the change in the deferral account, together with the change in the definition of Trade Income, will have on dividends to the Province.

19.0 Reference: Volume 1, Chapter 2, page 12

On page 12, BC Hydro discusses the volatility of Trade Income. Please provide historical data on volatility of:

- (1) cost of energy
- (2) Trade Income.

20.0 Reference: Volume 1, Chapter 2, page 13

BC Hydro's proposal states:

“However, in the Hydro Quebec model the fixed quantity (165,000 MWh) is less than the average system capability. Because the Terms of Reference require the Heritage Contract to be based on average water, the direct application of the Hydro Quebec model to BC Hydro would impose greater costs on the Heritage Beneficiaries.”

- 20.1 Please describe in greater detail the Hydro Quebec model. What is the average system capability of the Hydro Quebec system?
- 20.2 Please explain why the direct application of the Hydro Quebec model would impose greater costs on the Heritage Beneficiaries.
- 20.3 If a fixed price, fixed quantity model were adopted for the BC Hydro system, please estimate how much a fixed quantity based on the same percentage of the average system capability as the Hydro Quebec model would cost the Heritage Beneficiaries, on average, compared to a fixed quantity based on average system capability. Please explain your answer.

### **Chapter 3: Detailed Explanation of Heritage Contract Proposal**

21.0 Reference: Volume 1, Chapter 3, p.18

The proposal states that “Although Powerex makes no decisions as to when and how BC Hydro's system is operated, it is closely involved in the development of these decisions.

- 21.1 Please expand upon the nature or process of this involvement.
- 21.2 What information does Powerex provide to BC Hydro to support decision making in this regard?

22.0 Reference: Volume 1, Chapter 3, p. 19

Please provide a copy of the most recent edition of the document “Making the Connection”

23.0 Reference: Volume 1, Chapter 3, p. 19

BC Hydro notes concerns with historical information and with simulation studies and concludes: “As a result, the estimate of future hydro generation is about 920 GWh higher than the historical average generation.”

23.1 Please provide more detail on the derivation of the maximum energy supply obligation, including the results of the historical analysis and the simulation studies and the specific adjustments made to derive the final estimate.

23.2 Have the simulation studies been calibrated to determine the degree of accuracy of the simulation model? If so, please describe how the calibration was done. How accurately did the model perform in the tests?

24.0 Reference: Volume 1, Chapter 3, p.19

24.1 Please provide a summary report of historical hydroelectric generation and Burrard Thermal generation over the last 20 years.

24.2 Please provide the distribution around forecast average generation capability from the simulation analysis.

25.0 Reference: Volume 1, Chapter 3, p. 20

25.1 BC Hydro provides some explanation of an adjustment to the Kootenay Canal data because of system optimization benefits related to the generation from the combined Pend d’Oreille and Kootenay River Systems. Please provide more detail on how this adjustment is calculated.

25.2 Please quantify the “small average energy benefit from the Keenleyside Entitlement Agreement.”

26.0 Reference: Volume 1, Chapter 3, p. 20

Please confirm that the total theoretical capability of the thermal heritage resources, if used, will go to the benefit of ratepayers, so long as the total Trade Income is less than \$200 million.

27.0 Reference: Volume 1, Chapter 3, p. 20

27.1 Does BC Hydro expect to seek approval for changes to the Heritage Energy if supply agreements or coordination agreements change during the term of the Heritage Contract?

27.2 Pricing based on “actual costs” for the Heritage Contract implies ongoing regulation of the generation business. What would the implications of a “fixed price” Heritage Contract be for the regulation of BCH Generation? Would a “fixed price” contract be more aligned with the policy of streamlining regulation, than the proposed Heritage Contract?

28.0 Reference: Volume 1, Chapter 3, p. 21

With reference to Table 1, (Volume1, page 21), please clarify and compare the alternative definitions of capacity and capability that were presented in "Making the Connection," April 2000, and "Integrated Electricity Plan", January 2000.

Firm Hydro Energy Capability Annual energy capability under period of lowest historical stream flow conditions [Integrated Electricity Plan, p. 10].

Average Energy Capability A twenty year average (except for newer facilities) ["Making the Connection", p.19].

Capacity (Dependable) Dependable winter capacity is based on 85% confidence level based on range of historical streamflow conditions [Integrated Electricity Plan, p.10].

Maximum Sustained Generating Capacity ...based on 1999 operating conditions. Not the same as Dependable Capacity ["Making the Connection", p. 19]

29.0 Reference: Volume 1, Chapter 3, p. 22

29.1 Please explain what is meant by the statement that BC Hydro is proposing to provide a bundled package of electricity services to the Heritage Contract Beneficiaries. Please confirm that there may also be some Heritage Contract Beneficiaries that may be provided unbundled service under the stepped rate and access principles.

- 29.2 Please explain how the continued provision of bundled service enables BC Hydro to minimize the cost of future resource additions.
- 29.3 If BC Hydro was providing unbundled service, what services would have to be supplied (e.g. ancillary services, line losses)?
- 29.4 If BC Hydro were to provide unbundled services, would it be providing ancillary services separately from the other energy delivered to the Heritage Contract Beneficiaries? Does the provision of ancillary services from the Heritage Resources create the potential for inequities with third party use of the BC Hydro transmission grid? If not, why not?

30.0 Reference: Volume 1, Chapter 3, p. 22

- 30.1 Does all power generated in any given hour that is not required to meet actual demand of the Heritage Beneficiaries become “Trade Income” surplus? Please explain. Is BCH Distribution responsible for scheduling non-Heritage Contract resources?
- 30.2 Will the distribution business either make nominations for Heritage Electricity or be submitting schedules for delivery of the Heritage Electricity, or both? Please provide details of any nomination and scheduling requirements. Do either nominations or schedules determine whether or not surpluses are available for trading activities (Trade Income)?
- 30.3 Will BCH Generation give system capability parameters to BCH Distribution? If so, what are the implications of such parameters on nomination and schedule requirements?

31.0 Reference: Volume 1, Chapter 3, p. 22

- 31.1 Please provide the basis or rationale for BC Hydro’s expectation that domestic demand will get ‘peakier’ and that most new resources will come on-line with relatively little ability to be shaped.
- 31.2 Please provide the historical or forecast basis that supports this expectation, if available.
- 31.3 What is the type and proportional mix of resources that BC Hydro believes will come on-line?
- 31.4 Why does BC Hydro anticipate that these factors will increase capacity demands on the Heritage resources in an “unpredictable manner”?

32.0 Reference: Volume 1, Chapter 3, p. 25

Assume that Powerex is able to purchase gas at a price less than the index price at which it sells the gas to BC Hydro. Will the margin that Powerex makes on the gas sold to BC Hydro have an impact on the Heritage Beneficiaries, and if so, what impact and under what conditions?

33.0 Reference: Volume 1, Chapter 3, p. 28

The second of the three key principles that underlie the proposed allocation methodology states that the allocation decision will be made at the time of the decision to import, export or generate for a particular day or time, based on the best information available to decision makers at that time.

33.1 Who are the decision makers that will make that allocation decision (i.e. which functional position within which organization)?

33.2 What are the criteria that will determine how that allocation decision will be made?

34.0 Reference: Volume 1, Chapter 3, p. 28

One of the key principles that underlie the allocation methodology follows:

“(3) Utilizing surplus capability to acquire electricity with the expectation of future export sales is the exclusive responsibility of Powerex.”

34.1 Please explain why granting “exclusive responsibility” to Powerex is an allocation principle? Does using the index price not address allocation issues? Does BC Hydro expect to enter into an exclusive agency or licensing contract with Powerex?

34.2 Under the Heritage Contract proposal, does Powerex’s performance directly impact the Heritage Contract Obligation or Trade Income and therefore the revenue requirement of BCH Distribution?

34.3 Is it in the interests of ratepayers to give BCH Distribution the discretion to select and use one or more third party agents to sell and purchase power on behalf of ratepayers? If not, why not?

35.0 Reference: Volume 1, Chapter 3, p. 28

BC Hydro is proposing that imports into the BC Hydro control area be valued at the Mid-Columbia (Mid-C) index price as was done in BC Hydro's Real-Time Pricing (RTP) tariff (plus the cost of transmission between Mid-C and the BC Border).

BC Hydro's RTP tariff provides for separate index prices for High Load Hour and Low Load Hour consumption and also offers options for the customer as to the specific Mid-C price it wishes used. Please provide more detail on the specific Mid-C index prices that are being proposed as a proxy for the import price.

36.0 Reference: Volume 1, Chapter 3, pages 28 and 29

Please explain the rationale for using the Mid-C index price for power and an index price for gas for payments made to Powerex. Why not use actual prices? What index price is proposed for gas purchases? Commission staff understand that the Mid-C trading hub is often illiquid and at times there are no transactions at all. In these circumstances how would the index be established?

BC Hydro states that they expect the BC Transmission Corp to discount the WTS transmission rates to BC Hydro, IPP's and third parties to encourage electricity trade. On what basis does BC Hydro expect these discounts to be formulated? What would be the amount of the discounts necessary to encourage electricity trade? Please explain what BC Hydro means by efficient transmission pricing and what does BC hydro envision as being efficient pricing?

37.0 Reference: Volume 1, Chapter 3, p. 29 and Energy Plan, page 15.

Given the change in the definition of Trade Income, please explain why the forecast of Trade Income of \$75 million to \$125 million is not significantly lower than the 1990s net trading revenue of \$100 million referenced in the Energy Plan?

38.0 Reference: Volume 1, Chapter 3, p. 29

BC Hydro is proposing that exports from the BC Hydro control area be valued at the Mid-C index price plus the cost of transmission between Mid-C and the BC Border.

As with the information request above, with respect to the Mid-C proxy for the import price, please provide more detail on the specific Mid-C index price or prices that are being proposed as a proxy for the export price.

39.0 Reference: Volume 1, Chapter 3, p. 29

39.1 If the price for power generated from its thermal plants was above BC Hydro's threshold price, such that the capability of the thermal plants was not being used to meet domestic needs, would Powerex have the ability to request that plants generate power for it to export?

39.2 If so, would the price of the gas supplied to the plant by Powerex for that power be matched to the power sold by Powerex? If not, please explain if the lack of matching would have a material impact on the Heritage Contract Beneficiaries, or why the prices would not be matched.

40.0 Reference: Volume 1, Chapter 3, p. 29

BC Hydro states that unlike previous definitions of the contribution of trade, Trade Income includes BC Hydro point-to-point transmission costs. This allocation of fixed transmission as variable costs allocated on a per transaction basis could distort the economic optimization of BC Hydro generation for trade. Wholesale Transmission Service tariff mechanisms do exist to discount transmission below the full price to mitigate this impact.

40.1 Please describe the Wholesale Transmission Service tariff provisions that exist to discount transmission below the full price to mitigate the impact of Transmission costs on the optimization of BC Hydro generation for trade.

- 40.2 To what extent is it anticipated that such discounting will be able to mitigate the impact on Trade Income?
- 40.3 To what extent might the use of such WTS provisions give rise to concerns about discriminatory pricing of transmission services?

41.0 Reference: Volume 1, Chapter 3, p. 33

BC Hydro proposes that the Heritage Deferral Account replace the existing Revenue Stabilization Account (RSA). Please outline any significant differences between the Heritage Deferral Account and the RSA.

42.0 Reference: Volume 1, Chapter 3, p.33

Please provide the distribution around forecast cost of energy from the simulation analysis.

43.0 Reference: Volume 1, Chapter 3, p. 33-37

- 43.1 Should variances from the forecast Heritage Payment Obligation be subject to a prudence review? If not, why not?
- 43.2 BC Hydro has proposed a deferral account such that all variances from forecast energy costs would be recovered or refunded to customers. Current regulatory practices are on a prospective basis. Does the creation of a deferral account for all costs of the generation business, including market purchases of gas and power, change the business risk profile of the generation business? If so, should Special Directive 8 be reviewed so as to change the capital structure and rates of return to be aligned with the changed?

44.0 Reference: Volume 1, Chapter 3, p. 34: "Demand for Heritage Energy"

- 44.1 Please explain the impact of changes in system load factor on the cost of energy. Please explain the storage or capacity constraints of the hydroelectric generation facilities that may increase the market purchases or IPP purchases that arise from a change in system load factor. Please provide illustrations with your answers.
- 44.2 Please provide a table and a graph of the dependable capacity balance of the Heritage Resources and a high/low peak capacity forecast for the next 10 years.

- 44.3 What are the implications, if any, of the Heritage Contract on resource planning as opposed to resource planning today?
- 44.4 Does the Heritage Contract have any implications for the dispatch of the hydroelectric facilities over current dispatch parameters? Please explain.
- 44.5 Please provide the aggregate cost of energy and capacity by year for the past ten years to meet the load requirements consistent with the Heritage Benefits. Please provide the regression data for volatility for the aggregate cost above as set out under “Hydroelectric generation” at Volume 1, page 34.

45.0 Reference: Volume 1, Chapter 3, p. 35

BC Hydro states that assuming a market cost of energy of \$60 per MWh, a +/-5000 GWh per year variation in hydroelectric generation can result in a +/- \$300 million in cost of energy.

Is \$60 per MWh a reasonable assumption for the market cost of energy? Why?

46.0 Reference: Volume 1, Chapter 3, p. 35: Gas and electricity market prices:

BC Hydro states that assuming average hydroelectric generation, a +/- \$20 per MWh variation in electricity market prices or gas generation costs can cause a variance in the cost of energy of +/- 40 million.

Please show the calculation and assumptions that are the basis of this statement.

47.0 Reference: Volume 1, Chapter 3, p. 35 “Forced Outages”

Does BC Hydro believe that the frequency of Forced Outages is, at least in part, a function of the maintenance program? Do BC Hydro operations also have some impact on the timing and duration of Forced Outages? Please explain why the risk of forced outages should be borne entirely by ratepayers? If the risk was borne by BC Hydro or shared between BC Hydro and ratepayers, would it be reasonable to assume an impact on frequency, timing, and duration of Forced Outages?

48.0 Reference: Volume 1, Chapter 3, p. 35: Finance charges

To what extent are the risks associated with the impact of foreign exchange rates on finance charges offset by the impact of foreign exchange rate on revenues from export trade?

49.0 Reference: Volume 1, Chapter 3, p. 37

BC Hydro states that it would seek the Commission's approval of the appropriate methodology to allocate the incremental costs and benefits associated with these non-Heritage Resources. Potential projects that BC Hydro may choose to develop outside the Heritage Contract include Units 5 and 6 at Revelstoke and Mica Generating stations.

49.1 What criteria does BC Hydro propose for differentiating between projects that will be developed within the Heritage Contract and those that will be developed outside the Heritage Contract?

49.2 Please explain, with reference to those criteria, what specific characteristics of Units 5 and 6 at Revelstoke and Mica Generating stations make them appropriate candidates for developing outside the Heritage Contract? To what extent do these upgrades rely on Heritage assets and to what extent will they make contributions to the Heritage assets?

49.3 Does BC Hydro reject the principle that current and future customers should get all "benefits arising from" the Heritage Resources? For example, would the Keenleyside expansion project developed by CPC/CBT be considered a Heritage Resource in the future because it derives benefits from an existing Heritage Resource? What definition should be applied to the determination of Heritage Resources in the future?

50.0 Reference: Volume 1, Chapter 3, p. 37: Recognizing Deferral Account Balances in Rates

On page 37 BC Hydro states that the Heritage Deferral Account will capture variances in the cost components of the Heritage Payment Obligation. It also states that it may apply for other deferral account mechanisms in conjunction with its revenue requirement filing in March 2004.

Has BC Hydro considered a deferral mechanism that would capture differences in actual revenue from forecast? If so, what did it conclude and why?

51.0 Reference: Volume 1, Chapter 3, p. 38

What is the current balance in the RSA?

52.0 Reference: Volume 1, Appendix A: Terms of Reference, Schedule A

The terms of reference for the Heritage Contract state that the Heritage Contract will be based on the resources and obligations as set down in Schedule A.

Please describe how BC Hydro proposes to incorporate the rights and obligations of schedule A. Please describe each Obligation and Right in the list (including quantity and cost of the Obligation or Right). In particular, please describe how the Downstream Benefits from the Columbia River treaty are proposed to be treated. Does Powerex propose to include the revenues from the sale of these benefits as trade income?

Does BC Hydro or Powerex have other obligations which are not on the list (e.g. similar to the Intalco contract)? How do these obligations impact the Heritage resources?

53.0 Reference: Volume 1, Chapter 3, Appendix C

Section 6 of the Heritage Contract states that BCH Distribution may use the capacity available to it under Section 2 to either deliver energy to meet customer demand or to satisfy its ancillary service obligations.

In BC Hydro's view could Section 6 be interpreted so as to restrict the sale of surplus power to export or other non-BC Hydro customers, and thereby prevent sales which would otherwise offset the Heritage Payment Obligation? Please explain your answer.

54.0 Reference: Volume 1, Chapter 3, p. 29 and Appendices D and E

The Heritage Deferral Account is defined in Appendix D as the mechanism for capturing the difference between the Heritage Payment Obligation and the forecast Heritage Payment Obligation, and the difference between Trade Income and forecast Trade Income.

On p. 29 of its proposal, BC Hydro states that Trade Income is defined more narrowly than it has been historically. Under the proposed definition most gross profit from sales of surplus hydro energy would not accrue to Trade Income, but would be allocated instead directly against the Heritage Payment Obligation.

54.1 Please clarify how the revenues from sales of surplus energy that are allocated directly against the Heritage Payment Obligation, are distinguished from the sales of energy that go to Trade Income.

54.2 In year 3 (for example) of Appendix E, an amount is shown for Surplus Hydro Energy. There is no year in Appendix E where there is an amount shown for Trade Income. Please provide an example showing year three amended based on the assumption that there was Trade Income available as well as income from the sale of Surplus Hydro Energy or explain why it is not appropriate to include it.

55.0 Reference: Volume 1, Chapter 3, p. 29, Appendix F, Schedule A, Generation Related Transmission Assets (GRTA)

BC Hydro states that it proposes to include in the Heritage Payment Obligation \$43.3 million related to the GRTAs. The amount was determined in a manner “consistent with” the Commission’s April 1998 BC Hydro WTS Decision and is the difference between the total transmission revenue requirement and the smaller portion of the transmission revenue requirement reflected in the current WTS rates. BC Hydro states that the amount may be thought of as the “GRTA revenue requirement”

55.1 Please explain how the GRTA revenue requirement was calculated to show how the calculation is consistent with the 1998 WTS Decision.

55.2 Included in the \$1,073 million equity allocated to the Heritage Resources for 2003 is an allocation of \$592 million of retained earnings. What is the basis for the allocation of the \$592 million?

56.0 Reference: April 20, 2003 Submission, Vol. 1, pp. 25-42  
May 13, 2003 Workshop

56.1 Further to the statement at the Workshop that the Heritage Contract will be a regulatory construct in the form of an agreement between parties that are divisions of B.C. Hydro, please clarify whether the agreement will be:

- between BCH Distribution and BCH Generation, with Powerex considered to be part of BCH Generation, (if so, will there be a sub-agreement between BCH Generation and Powerex)
- among BCH Distribution, BCH Generation and Powerex, or
- among some other set of parties?

56.2 Please identify the types of transactions between Powerex and BCH Distribution that do not relate to the Heritage Contract, but which will impact the calculation of Trade Income.

57.0 Reference: April 20, 2003 Submission, Vol. 1, pp. 22, 25-42  
May 13, 2003 Workshop

- 57.1 Further to the statement on page 22 that the large reservoir storage capacity is a most valuable aspect of the hydroelectric Heritage Resources, will Heritage Beneficiaries have first call on all values that can be derived from the Heritage Resources? If B.C. Hydro considers that some aspects of the Heritage Resources, such as reservoir storage capacity, or the ability of thermal generation to produce excess power, should not be for the benefit of Heritage Beneficiaries, please explain how this is consistent with the Terms of Reference.
- 57.2 Slide 29 from the Workshop states that B.C. Hydro will sell surplus hydroelectric energy to Powerex at market prices. Please confirm that B.C. Hydro can choose to not sell surplus hydro energy to Powerex even though the power is (or is expected to be) in excess of 49,000 GWh for the year.
- 57.3 How will it be determined whether surplus energy is power that is surplus B.C. Hydro hydroelectric energy, or is a sale of third-party power bought in a prior period (presumably by Powerex), as identified on Slide 29?
- 57.4 In any period when B.C. Hydro and Powerex generate and buy more energy in total than they need for sales during the period, is it reasonable to understand that the surplus energy is stored in the reservoirs that are Heritage Resources? If not, please explain.
- 57.5 As steward of the Heritage Resources, please explain if B.C. Hydro believes that BCH Generation should not be the owner of all energy that is stored in the reservoirs.
- 57.6 Please use numerical examples to illustrate how B.C. Hydro proposes to differentiate between B.C. Hydro's surplus hydro energy, and energy that Powerex had purchased in a prior period. Then, please use numerical examples to show how the revenue from export sales in each scenario would impact the Heritage Payment Obligation and Trade Income.
- 57.8 Please explain whether the treatment of the excess energy sales has any net impact on B.C. Hydro's customers.

58.0 Reference: April 30, 2003 Submission, Vol. 1, pp. 25-42  
May 13, 2003 Workshop

- 58.1 Slide 29 from the Workshop implies that surplus energy that may be available from thermal generation such as Burrard would not be treated the same as surplus hydro energy. If this is the case, please discuss why, and explain why B.C. Hydro considers the distinction to be consistent with the Terms of Reference.
- 58.2 Further to Slide 23 from the Workshop, please clarify if the Heritage Payment Obligation would include all asset related costs and operating costs at Burrard, other than fuel to generate energy that is not purchased by BCH Distribution. Please identify any other costs related to Burrard that are excluded.
- 58.3 Assuming the energy generated is used by B.C. Hydro to meet domestic load, please explain where the cost of fuel for thermal generation of energy using Heritage Resources is included on Slide 23. How is this fuel priced when determining the cost to B.C. Hydro?
- 58.4 Are there any circumstances where energy generated in a Heritage Resource would be sold under the Heritage Contract, or otherwise, to BCH Distribution at a price that is market based, rather than cost based? If there are, please explain the circumstances and justify the proposal.
- 58.5 Please outline the arrangements for the “purchase” by BCH Distribution of power from B.C. Hydro generation resources that are not Heritage Resources, such as the Island Cogeneration Plant and the Vancouver Island Generation Project. How will the price paid by BCH Distribution be determined? Please identify all the ways that the arrangements for the purchase of this power will impact on Trade Income, using a numerical example to illustrate the transactions.
- 58.6 With reference to the foregoing question, please identify any areas where the calculation of Trade Income is materially different for energy from Heritage Resources, compared to energy from other B.C. Hydro generation resources.

## VOLUME 2: STEPPED RATES AND ACCESS PRINCIPLES

59.0 Reference: Volume 1, Chapter 1, p. 5, and Volume 2, Appendix A, p. 8

BC Hydro's proposal states:

"BC Hydro also believes that the objective of light-handed regulation, and the encouragement of independent power producers elaborated in the Energy Plan, reflect a belief that where market mechanisms can work they should be permitted to do so to as great an extent as possible."

The Energy Plan proposes time-of-use rates and stepped rates. For the following questions, please assume that the benefits of the overall policy objectives of the Energy Plan, including customer choice for transmission customers and economic development, justify the risks of stepped rates based on the cost of new supply for the Tier 2 rate.

- 59.1 Please identify the parameters of stepped rates that are relevant to the determination of the appropriate access principles. For example, the cut off point between Tier 1 and Tier 2, the magnitude of the rate difference between Tier 1 and Tier 2, or any other parameter of stepped rates that is relevant to the determination of access principles.
- 59.2 Please comment on the appropriateness of a block rate design based on load factors for meeting the objectives of the Energy Plan. For example, consider a block rate design based on the system load factor so that hourly energy taken, when the customer's demand exceeds a demand level based on system demand, attracts the second tier rate.
- 59.3 Please discuss the relative advantages and disadvantages of a time-of-use rate and stepped rates as compared to time-of-use rates and block rates for enabling the development of projects by Independent Power Producers.
- 59.4 Is a time-of-use rate together with a block rate, as described above, a preferred rate design for achieving the objectives of the Energy Plan? Are there combinations of rates other than time-of-use rates and stepped rates, that may better meet the objectives of the Energy Plan without the challenges associated with determining CBLs? If so, please describe them.
- 59.5 Please also discuss rate design options for transmission customers that are not revenue neutral. Assume a larger allocation of the benefits of the Heritage Contract to non-transmission customers so that those customers are compensated for the risks of rate design options that are not revenue neutral.

59.6 Please provide access principles that appropriately manage the risks for a combination of stepped rates and time-of-use rates, blocked rates and time-of-use rates and for any other combination of rates that are identified in the answers to the questions above.

## **Chapter 2: Principles for BC Hydro Stepped Rate Design**

60.0 Reference: Volume 2, Tab 2, p. 3 and Appendix A: Stepped Rate Design Report by E3

Please confirm that BC Hydro is recommending that the stepped rate design should be a mandatory tariff and that the Schedule 1821 would not be retained as a default tariff.

Please confirm if BC Hydro's proposal includes making the 1821 tariff available under any conditions after the introduction of a stepped rate.

61.0 Reference: Volume 2, Tab 2, p. 4

BC Hydro's proposal states that "Under incremental pricing, bill credits granted to customers for their energy savings do not exceed BC Hydro's risk-adjusted value of the saved energy, and bills sent for additional growth cover BC Hydro's incremental costs and risks of acquiring new supply."

Please explain and provide an example of how the risk-adjusted value of saved energy is determined.

62.0 Reference: Volume 2, Tab 2, p. 4

BC Hydro states that it expects that the Commission will allocate the costs of electricity in the Heritage Contract among the appropriate customer classes on a pro-rata basis as part of BC Hydro's upcoming revenue requirements process.

3.3.1 Please describe the type of pro-rata process or calculation that BC Hydro anticipates would be used in such an allocation process.

3.3.2 Is such an allocation process required in order to implement stepped rates? If not, why not?

63.0 Reference: Volume 2, Tabs 2 and 3, pp. 6-8

On page 6, BC Hydro states that a phased-in implementation starting with a relatively simple design may be the most prudent way to implement a new structure. On page 8, it states that

further stakeholder input is necessary to advance beyond high-level principles and develop specific mechanisms to determine CBL's.

- 63.1 If a relatively simple stepped rate design is implemented as the first step in a phased-in process, please confirm that a mechanism used to determine CBL's will be required.
- 63.2 Is it likely or possible that the initial stepped rate could rely on the same mechanism for determining CBL currently embedded in several BC Hydro industrial tariffs (e.g. 1848)? If not, why not?
- 63.3 Please discuss alternative forms such a "relatively simple design" might take, and if possible provide examples of such designs that could be implemented reasonably quickly as the first step of a phase-in process for more complex options.
- 63.4 Has BC Hydro considered alternative forms of a "relatively simple design" that might be initially implemented and then phased out as more complex options were developed? If so, please describe the form such rates might take and the advantages or disadvantages of each.

64.0 Reference: Volume 2, Tab 4, p. 10

BC Hydro poses the question: "Should a customer's CBL change with its load over time and how should the load of new customers be treated?" Also on page 10, BC Hydro states that it does not believe the Energy Plan contemplates vintaging access to the low embedded cost of BC Hydro's existing generating resources.

- 64.1 In BC Hydro's view, if vintaging is not intended by the Energy Plan, does that imply periodic reviews of the CBL or not? Please explain your answer.
- 64.2 In BC Hydro's view could periodic, but infrequent, reviews of the CBLs be undertaken without undermining incentives for firms to engage in efficiency or alternative supply initiatives? Please explain your answer.

65.0 Reference: Volume 2, Tab 4, p. 11

The proposal states that if the final rate design caused undesirable behaviours, the terms and conditions of ongoing access to the shopping credit could be adjusted more easily than undertaking a wholesale redesign of a two-part rate.

- 65.1 Please explain how the shopping credit is more easily adjusted in the face of potential sunk costs by customers.
- 65.2 Please also explain how the shopping credit might be adjusted in light of unwanted responses to the rate and how that adjustment might differ from simply changing the Tier 2 rate.

66.0 Reference: Volume 2, Tab 4, pp. 11-12

On page 12, the proposal states that a stepped rate without a shopping credit, “for all intents and purposes” allows direct access only for that portion of load served at the Tier 2 rate. On page 11, BC Hydro’s proposal states that the shopping credit mechanism has a number of advantages over a strict two-part rate design.

- 66.1 Has BC Hydro considered hybrid rate designs that combine elements of both a two-part rate and a shopping credit? (For instance, the sentence cited from page 12 suggests that some consideration may have been given to a two-part rate with a shopping credit.)
- 66.2 If some hybrid rate designs have been considered, how have they been structured, and how do they compare to a strict shopping credit or strict two-part rate?

67.0 Reference: Volume 2, Tab 4, pp. 12-13

On page 12, the proposal states that “...the E3 report makes clear that determining the manner in which retail industrial customers should obtain access to transmission is potentially very complex.” It goes on to say that it would be “...undesirable to adopt a stepped rate design that would necessitate immediate redesign of the Wholesale Transmission (WTS) tariff.”

- 67.1 Please confirm that the E3 report also concludes on page 60 that:  
“Prior to re-determination of WTS and the ancillary services contained within the WTS tariff, the use of the 1821 demand charge as a transmission charge proxy (under Option 1) is probably the easiest to implement. It avoids redefining ancillary services under WTS and allows BC Hydro and other suppliers to provide prices for all incremental usage that reflect specific energy and capacity requirements of any customer’s change in incremental consumption.”
- 67.2 If there are other complexities not addressed by the E3 conclusion please identify specifically what they are.

67.3 On page 13, BC Hydro states that the shopping credit mechanism may obviate the need to use WTS for the provision of direct access. Please confirm that the conclusion of the E3 report cited above is also applicable to the stepped rate design. If that is not the case please explain why.

68.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 8

On page 8, the report states that preserving the option of serving load at 1821 rates might give industrial customers who are working with wholesale marketers the ability to purchase power at a low embedded cost-based price and resell it at higher market-based prices. Please explain.

69.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.8

The report states that the stepped rate should be “revenue or bill neutral” at historical consumption levels.

Please comment on any other stepped rate designs not considered in this report that meet the “revenue-neutral” requirement, but do not meet the “bill neutral” requirement. Are there any designs that would result in this outcome but have significant other benefits or advantages relative to the designs reported in Appendix A? If so, please discuss.

70.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.10

From BC Hydro’s perspective, are there stepped rate designs that meet the objectives of the Energy Plan, but that violate the guidelines set forth by BC Hydro as the basis of the stepped rate report? If so, please discuss them.

71.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.17

The report states a requirement that the stepped rate cannot shift the costs among customers.

71.1 Are there revenue to cost ratios that do not equal 1.0 for BC Hydro customers under the current 1821 rate?

71.2 If so, please discuss whether this requirement may be too stringent as to preclude other rate designs. For example, are there other rate designs not considered in the Report that may narrow the range of revenue to cost ratios across customers who pay the 1821 rate? If so, please discuss.

72.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 19

On page 19, the report states that customers must be meaningfully able to choose retail direct access, free of the onerous requirements that have accompanied such a choice in other jurisdictions.

72.1 Please provide a summary of the other jurisdictions surveyed and the “onerous requirements” related to retail direct access imposed in each.

72.2 Please comment on the rationale of these requirements relative to the ratemaking objectives in these jurisdictions.

72.3 What have been the expected or realized advantages and disadvantages of these requirements in these jurisdictions? Why have these requirements been regarded as onerous? Please provide supporting information as appropriate.

73.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 20

Page 20 of the Stepped Rate Design Report states that a fundamental change to the 1821 tariff would require a reallocation of BC Hydro’s embedded costs among customer classes, triggering a lengthy regulatory proceeding.

If the 1821 tariff will not be available under any conditions after the introduction of a stepped rate, can one conclude that any redesign of the 1821 tariff is “out-of-bounds”?

74.0 Reference: Volume 2, Tab 4, p. 12, and Appendix A, p. 20

On page 12, BC Hydro’s proposal states that:

“The objective of transferring responsibility for the operation of BC Hydro’s transmission system to a new corporation that will have responsibility, amongst other things, to design transmission rates, makes it undesirable to adopt a stepped rate design that would necessitate immediate redesign of the Wholesale Transmission Service (WTS) tariff.”

Similarly, page 20 of the E3 Report attached as Appendix A says:

“...to avoid unnecessary regulatory process, any changes to the industrial tariffs must not require substantial changes to the WTS design.”

Please explain what changes to the WTS tariff would be required with a change to stepped rates. Please also explain which of those changes would not also be required to provide for industrial retail access. When does BC Hydro expect to provide retail access to transmission level customers?

75.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 21

The report states on page 21 that changes to BC Hydro's revenues as a result of customer choices must be exactly offset by cost changes. It goes on to say that if an industrial customer invests in self-generation, the gross revenues that BC Hydro collects from its industrial customers will be lower. However, the investment also creates surplus energy that BC Hydro can sell, or alternatively reduces the energy that BC Hydro must procure on the wholesale market.

What other actions could BC Hydro take, other than selling or procuring on the open market, to offset the impact of customer choices on its revenues?

76.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 22

Section 3.1 discusses issues related to establishing a customer baseline (CBL).

76.1 Which industrial rate schedules currently offered by BC Hydro that are available to 1821 customers require calculation of a CBL?

76.2 Is the CBL calculated in the same manner for all of the above rate schedules?

76.3 If the intent of the proposal is to keep the new stepped rate margin and revenue neutral, is the existing method of calculating CBL inappropriate, and if so, why?

76.4 Please discuss other potential approaches to setting a CBL, list the advantages and disadvantages of each, and provide an assessment, through discussion, explicit ranking or other means, of how BC Hydro prefers that CBLs would be measured.

76.5 Please discuss how new and existing customer growth could impact the measurement of CBLs and discuss alternative approaches to incorporating or mitigating these impacts.

77.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.23

The Report contemplates the issue that "if BC Hydro is going to allow new customers to take service on the stepped rate, [should it] also provide comparable adjustments in the baseline level of usage for existing customers who make new investments in their businesses?"

77.1 Please answer the above question assuming that BC Hydro does allow new customers to take service on the stepped rate.

77.2 Please discuss BC Hydro's preference to allow new customers to take service on the stepped rate.

78.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.24

The example on Page 24 depicts a Tier 1 rate result equal to an "unreasonably low" \$0.002/kW.h.

Please discuss any criteria for determining whether a Tier 1 energy rate would be regarded as "unreasonably low".

79.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 27

Section 3.2 states that a shopping credit mechanism is consistent with the Energy Plan's call for "time of use rates that encourage customers who can manage the timing of their electricity use to shift consumption to low-priced off-peak periods".

Please confirm that credits in the shopping credit mechanism are not related to the time of consumption, but rather to the level of monthly demand relative to the CBL.

80.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, pp.27-28

On pages 27 and 28, the report states that the shopping credit would allow BC Hydro's industrial customers to receive credits for self supply that reflect market value.

80.1 What is an appropriate definition of market value?

80.2 Why is market value an appropriate value for the credit as opposed to BC Hydro's long-run avoided cost?

80.3 Would the shopping credit design encourage customers to simply curtail production when the market price of electricity was high? If not, why not? If so, is that an appropriate objective of an industrial rate?

81.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 28

On page 28, the report states that the shopping credit has been extensively used in restructured markets where there is a defined transition period from bundled to unbundled rate structures.

Is the shopping credit being proposed in this instance as a transitional measure? If so, does BC Hydro expect that, following the transition, a stepped rate would be applied for?

82.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 33-35

The report gives several reasons why the shopping credit could arguably be less than the Tier 2 rate, and in figure 5 shows a stepped rate with a shopping credit of 5.4¢/kWh and a Tier 2 rate of 6.2¢/kWh. The basis for the Tier 2 rate is provided in Table 7 on page 46.

Please provide the basis for the estimate of a 5.4¢/kWh shopping credit.

83.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.34

The Report contemplates how to allocate between participating and non-participating customers the gains that result when a customer makes use of the shopping credit to reduce consumption below its CBL.

83.1 Please discuss in more detail the nature and potential magnitude of these gains under different scenarios of a customer's consumption relative to its CBL.

83.2 Assuming that a rate design includes a shopping credit, please specify BC Hydro's recommended approach to allocating such gains between participating and non-participating customers.

84.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 35

The report states that if the shape of load reductions is different from the shape assumed in calculating the Tier 2 rate, incremental and decremental load would have different values to BC Hydro.

84.1 What is the assumed load shape used as a basis for the Tier 2 rate and how was it determined?

84.2 Please explain or illustrate how a customer load shape different than the one assumed would create a different value to BC Hydro for incremental or decremental load.

85.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 36

The report states that if customers are granted full shopping credits for any load reduction regardless of cause, there may be situations in which it is more profitable for a customer to shut a facility permanently and take the shopping credit than to continue operations in British Columbia.

Please confirm that this incentive does not exist in the case of a stepped rate without the shopping credit. If not, please explain.

86.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 37

Footnote 6 on page 37 discusses the purchase of load reduction programs from aluminum smelters in 2000-01 by the Bonneville Power Administration (BPA), and the restrictions placed on the purchases by the BPA.

Were the outcomes of the BPA program successful and were the restrictions effective in generating the required load reductions and the intended power supply or efficiency gains?

87.0 Reference: Volume 2, Tab 2, p. 5 and Appendix A: Stepped Rate Design Report by E3, p. 38

BC Hydro states on page 5 that it does not believe the Energy Plan intended for Heritage Beneficiaries to be identified individually on a customer specific basis, nor did it intend for rate designs to have the effect of assigning heritage value directly to individual customers. Page 38 of the Stepped Rate Design Report, states that the rate design parameters are assumed to be fixed at a given point in time and are not updated based on the new customer behaviour.

Is it intended or expected that BC Hydro would review customers' CBLs periodically? If so, why and how often should the reviews take place? If not, why not?

88.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 42

Please confirm that if the shopping credit was 5.4¢/kWh, as shown on page 35, the total bill for the Shopping credit customer in Table 5 on page 42 would be \$151,900 rather than \$135,900.

89.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, pp. 43-44

The analysis in Table 6 on page 43 suggests that only the shopping credit approach allows a customer to realize savings from pursuing a self-generation or third-party supply option. The discussion on page 44, then discusses the public policy concerns surrounding a potential windfall for a customer that reduced its demand substantially by closing facilities.

89.1 Would adjusting the CBL to account for the new self-generation or third-party supply allow similar savings to the shopping credit approach when a customer adopted some self-generation or third party supply? If not, why not?

89.2 Would metering the amount of self-generation or third-party supply consumed by the plant be a simpler means of avoiding the public policy issue mentioned above, compared to an audit or approval process? If not, why not?

89.3 Could the public policy concerns be addressed by introducing a stepped rate that also included a shopping credit below the Tier 1 cutoff to the extent that the customer was relying on either self-generation or third party supply?

90.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 47

Please explain the statement that BC Hydro's peak to off-peak value differences are generally higher than those indicated in the market because of the ability of the hydroelectric system to provide storage.

91.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 48

91.1 The report states that the unique characteristics of BC Hydro's system make it difficult to send accurate price signals to load shifting customers.

Please expand on this statement, indicating whether it is possible to send accurate price signals to load shifting customers and if so, how.

91.2 The report further states that, while the LRIC approach could be modified to produce time-of-use rates, these rates are unlikely to meaningfully reflect the time-sensitive value of load reductions.

Should this statement in conjunction with the statement above be taken to infer that there is no acceptable method for reflecting the time-sensitive value of reductions? If not, why not? If so, on what basis should time-sensitive rates be developed?

92.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 49

The report states that an adjustment of the base index or RFP-based price would be required to reflect the load shape of the industrial customer or customers on whose behalf BC Hydro purchased Tier 2 energy.

Please describe in greater detail the nature of such an adjustment to:

- (a) a Mid-C index-based price
- (b) an RFP-based price

93.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.49

The Report discusses that, for Tier 2 rates based on short-term estimates of the cost of new supply, market prices would have to be adjusted for such factors as transmission charges (including ancillary services and real power losses), load shape, congestion, and reservoir storage.

Would it be possible to make such adjustments in a transparent and simple manner? If so, please explain how and provide an example.

94.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 50-51

94.1 On page 50, the report states that “If the stepped rate design requires BC Hydro to lock in a Tier 2 rate at a given level for a given period of time, this rate would not be margin-neutral if it did not include a markup above the new supply cost to reflect the price and volume risk.

To what extent could the price and volume risk be mitigated (for example, by locking-in the value of Tier 2 energy through long-term contracts or by creating a deferral account to manage volatility)?

94.2 On page 51, the report states that the principal choice of Tier 2 rate designs is between a longer-term, stable rate and a short-term variable rate.

Could a combination of the two, (for instance an initial Tier 2 price based on a fixed price/fixed volume contract and an additional Tier 2 step [or Tier 3] based on an index-based price) be used to mitigate the price and volume risks that BC Hydro cites?

95.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 54

The report says that as long as the rate each customer pays reflects the true costs, including opportunity costs, associated with its choice of rate parameters, each customer choice would be margin neutral and would not affect other customers.

95.1 To what extent does the inclusion of opportunity costs in the calculation of a rate make the rate a market-based rate rather than a cost-based rate? How would opportunity costs be included in a cost-based rate? Please explain your answers.

95.2 Is BC Hydro's 1821 rate margin neutral as defined in the E3 report? If not, please explain why the stepped rates need to be revenue neutral with consideration of the opportunity cost.

96.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 56-58

The report states on page 56 that Option 2 for a transmission charge "...would effectively freeze the customer's transmission contribution at the existing CBL level...."

If a customer opted to install a significant portion of self-generation would the customer's CBL change? If so, would that change the calculation shown in Table 8 on page 58? If so, please provide a revised table showing the example of such a customer with the impact of the revised CBL.

97.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 63

"It is important to note that price risk and volume risk are not endemic to the stepped rate structure alone. These already exist under the 1821 rate. However, by providing substantial incentives for customers to reduce their purchases from BC Hydro, the introduction of the stepped rate design may involve incremental risks for BC Hydro."

Assuming that the notice period for a customer to leave utility supply matches the commitment to customers for a fixed Tier 2 rate, is the risk to BC Hydro less under the stepped rate than under the 1821 rate? Please explain.

98.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 64

On page 64, the report states that non-participating customers are held harmless if the spread is zero with a shopping credit exactly equal to BC Hydro's opportunity cost.

Would non-participating customers also be held harmless if the shopping credit was equal to BC Hydro's avoided cost (such that the credit for the reduced power consumption was offset by the same amount of reduced power generation at the same price)?

99.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 65

The report states on page 65 that BC Hydro's storage means that Mid-C (index) prices understate BC Hydro's opportunity costs in the spring and overstate them in the summer.

If the shopping credit was based on BC Hydro's short-term avoided costs, does the same pattern hold as for the opportunity cost? Please explain your answer.

100.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 66

On page 66, the report notes the dynamic characteristic of the spread between BC Hydro's opportunity costs and Mid-C prices, and states that the unique characteristics of BC Hydro's system will make it difficult to develop a rate mechanism that is both simple and accurate.

In that case, is the opportunity cost the appropriate benchmark to use as a shopping credit and, if so, why?

101.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 66, Section 6.3: Risk of arbitrage between short-term and long-term rate design choices

101.1 Is there any significant risk of the customer installing self-generation and using its own supply when its cost of generation is less than either the BC Hydro rate or the market rate, but reverting to BC Hydro supply when its cost of generation or the market price exceeds the cost of BC Hydro supply?

101.2 If so, can and should that risk be mitigated? If so, how?

102.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, pp. 67-68, Section 6.4: Risk of arbitrage among rate design choices based on load factor

The report, in section 6.4 appears to use the terms load shape arbitrage and load factor arbitrage interchangeably. Please confirm that the terms are intended to be interchangeable.

103.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 68

103.1 Please show the calculation used to estimate the \$5 million loss under prices such as those that occurred in 2001.

103.2 Based on the final sentence in section 6.4 that the relatively small loss is largely due to the high load factors of Schedule 1821 customers, please confirm that in a period of less extreme prices than those which occurred in 2001 (i.e. normal prices) the potential risk would be significantly less? If not, why not?

104.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, pp. 69-70, Section 6.5.1: Mitigating market risk

Could the price risk associated with the shopping credit or Tier 2 rate be mitigated by use of a deferral account coupled with a longer-term price index or weighted-average avoided cost? If so, how might such a mechanism operate? If not, why not?

105.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p. 72

105.1 If there is a harm created due to direct access customers arbitraging between the market price and the shopping credit rate, can that harm be mitigated by appropriate shopping credit rate design? If so, how?

105.2 If the shopping credit rate can be and is designed to appropriately compensate BC Hydro and other ratepayers for the energy and the risk associated with the shopping credit, is an inequity created by direct access customers arbitraging between the market price and the shopping credit rate? Please explain your answer.

106.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3, p.71

Please describe the mechanisms for adjusting shopping credits to reflect appropriate load profiles.

Please comment on the relative transparency, simplicity and complexity of such adjustments from a BC Hydro and customer perspective. Please provide an example or examples of how this could be done.

107.0 Reference: Volume 2, Appendix A: Stepped Rate Design Report by E3

The report contemplates a process by which a customer can request a particular rate form and a methodology for determining a margin-neutral rate.

Please discuss potential mechanisms or frameworks for such a process/methodology, their advantages and disadvantages, and BC Hydro's proposed approach in this regard.

108.0 Reference: Volume 2, Appendix D: Tabs vi and vii

How will the Heritage Contract recognize and accommodate wholesale customers such as Aquila and New Westminster?

109.0 Reference: Energy Plan, p. 33, Policy Action #21

Policy Action #21 states: New rate structures will provide better price signals to large electricity consumers for conservation and energy efficiency.

109.1 Please provide a forecast of penetration rates, on a number of customers and total load basis, for retail service by alternative suppliers under each of the following alternative rate designs.

- a) existing tariffs;
- b) stepped rates with a cut-off of 90% of a customers CBL, with a Tier 2 rate based on each of the short run marginal cost, long run marginal cost, and the long run avoided cost;
- c) stepped rates with a cut-off of 80% of a customers CBL, with a Tier 2 rate based on each of the short run marginal cost, long run marginal cost, and the long run avoided cost;

- d) stepped rates with a shopping credit as identified in the E3 report;
- e) a block rate based on the customers' demand relative to the system load factor such that, when a customers' demand exceeded a demand based on the system load factor, it would attract a Tier 2 rate; and
- f) any other rate design option identified as desirable by BC Hydro.

Please explain all assumptions used to prepare the calculation and assume all rate design alternatives include WTS revisions permitting retail access. If the penetration rates cannot be forecast, then forecast them on a relative basis.

109.2 Please assess each of the alternative rate design options in the proceeding question against the following policy objectives:

- a) Conservation;
- b) Energy efficiency;
- c) Energy development by IPPs
- d) Equity and fairness amongst customer classes
- e) Regulatory streamlining
- f) Economic development