BC Hydro
Power smart

Fred James
Chief Regulatory Officer
Phone: 604-623-4046
Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

May 11, 2017

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

RE: Project No. 3698869
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
F2017 to F2019 Revenue Requirements Application

BC Hydro writes as required by BCUC Order No. G-20-17 (Exhibit A-22) to submit its responses on Rebuttal Evidence information requests as follows

Exhibit B-21	Responses to BCUC (Public Version)
Exhibit B-21-1	Responses to BCUC (Confidential Version)
Exhibit B-22	Responses to Interveners
Exhibit B-22-1	Responses to Interveners (Confidential Version)

Confidential IR Responses - As provided by section 42 of the British Columbia *Administrative Tribunals Act* and section 1 of the Commission's Confidential Filings Practice Directive, BC Hydro requests confidential filing with the Commission for responses and/or attachments to responses, the reason for each request is set out in the public version of each response.

For further information, please contact Gordon Doyle at 604-623-3815 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Fred James
Chief Regulatory Officer

gd/rh

Enclosure

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.1 Does BC Hydro have any insight as to why no other jurisdiction has run "a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day)"? Please explain.

RESPONSE:

BC Hydro expects that no other jurisdiction would have run a similarly structured pilot because their system needs are different.

Please refer to BC Hydro's response to CEC IR 3.180.1 for further discussion of the differences between BC Hydro's capacity requirement and those of other jurisdictions.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.1.1 Does BC Hydro consider that the cost to its customers of "36 days of curtailment of 16-hours per day" (i.e. the value of lost load) is significantly lower in BC compared to other jurisdictions? Please explain.

RESPONSE:

No. Other jurisdiction costs are not based on 36 days curtailment of 16-hours per day, so BC Hydro cannot make a comparison.

Please refer to BC Hydro's response to BCOAPO IR 2.103.1 for an explanation of regarding the 16 hours per day and 36 days of curtailment, and BC Hydro's response to CEC IR 3.180.1 for a discussion of the differences between BC Hydro's capacity requirement and those of other jurisdictions.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.1.2 Does BC Hydro consider that its system needs are uniquely different from other utilities? Please explain.

RESPONSE:

Please refer to BC Hydro's response to CEC IR 3.180.1 for reasons why BC Hydro's capacity needs are different from other utilities.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.2 Please reproduce Table 5 of BCUC IR 183.3, replacing the two DSM $ budget columns (F2018 and F2019) with a single column showing the DSM budget for three years from F2017–F2019.

RESPONSE:

This IR also responds to BCUC IR 3.339.2.1.

The revised Table 5 of BCUC IR 1.183.3 is below.

BC Hydro is embarking on a range of different capacity-focused initiatives across all three customer sectors: residential, commercial, and industrial. In many cases these will test different technologies that will directly align with the system need of 16-hours. Other technologies will be able to provide capacity solutions but for shorter times which may then allow for aggregation to meet the 16-hour need. In some cases, specific options will deal with localized distribution system constraints and may partially contribute to meeting the system peak need (these are noted as partial in the table below).

With respect to jurisdictions that are investigating capacity-focused demand-side management options, we need to learn how to incorporate technologies and solutions into our system to deal with the 16-hour peak. While we are aware that other jurisdictions may be looking at similar types of initiatives, we also recognize that each jurisdiction is unique and therefore may need to test different technologies, customer bases and/or different peak periods. For example, a given

jurisdiction may be testing low-voltage thermostat controls to shift central cooling loads for summer peak, whereas our opportunities may be related to the ability to use line voltage thermostats to control heating load for winter peaks where a number of thermostats are within each home. In addition, customers in given markets may be more or less conditioned to the concept of shifting the timing of energy usage and as a result, could be more or less responsive to these opportunities.Therefore, the learnings from other jurisdictions' pilots may be limited and further demonstrates the need for BC Hydro to pilot these initiatives. This should be taken into account when referencing the jurisdictions shown in the table below.

Revised Table 5:

Initiative	F17-F19 Budget ($ '000s)	Contributes to 36 days of 16-hours	Jurisdictions	Other Benefits
Localized Demand-Side Management Pilot	**5,000**	**Partial**	**Rhode Island, New York State, Maine**	**Using non-wires alternatives to defer distribution system upgrades. Will have some impact on transmission system peaking issues.**
Residential Demand Response Trials	**5,190**	**Yes**	**Note 1**	**We do not expect to have a single resource to meet all our capacity needs. We are testing technologies that then can be utilized on a larger or aggregated scale to meet the system peak needs of 36 days x 16-hours or to contribute to a non-wires alternative on the distribution system.**
Commercial and Industrial Demand Response	**7,700**	**Yes**	**Note 1**	**See above: Residential Demand Response Trials.**
Connected Home	**3,700**	**Partial**	**Note 2**	**Focused on looking at technologies and partnerships with the technology providers to determine opportunities for capacity initiatives.**
Industrial Load Curtailment	**7,805**	**Yes**	**No other jurisdiction is curtailing for 16-hours a day.**	

Initiative	F17-F19 Budget ($ '000s)	Contributes to 36 days of 16-hours	Jurisdictions	Other Benefits
Demand Response Management/ Distributed Energy Resource Management System	**2,600**	**Yes**	**Many jurisdictions have a form of Distributed Energy Resource Management System (DERMS).**	**The DERMS will allow BC Hydro to have better control over managing various options in reducing peak loads.**
Adapt capacity-focused demand-side management pilots in response to potential new loads from low-carbon electrification	**6,000**	**Partial**	**We are not aware of any other jurisdiction with a similar initiative.**	**As more electrical load is brought onto the system we need to determine and respond to the impact on the system capacity and the distribution systems' capacity. Capacity-focused demand-side management is a potential lower cost option compared to upgrading facilities.**

Note 1: Examples of utilities include: Water Heaters – Great River Energy, Tennessee Valley Authority, First Electric Co-op, New Zealand, Otter Tail Power, Hawaiian Electric; Baseboard heating – New Brunswick Power, Central Electric Co-op; Electric vehicle charging – Toronto Hydro, Pacific Gas & Electric, Seattle City Light, Avista, Southern California Edison.

Note 2: Examples of utilities include: Austin Energy, Bonneville Power Administration, Consolidated Edison, DC Sustainable Energy Utility, Duke Energy, Focus on Energy – Wisconsin, Pacific Gas and Electric, Southern California Edison, Puget Sound Energy, Sacramento Municipal Utility District, San Diego Gas and Electric, Xcel Energy.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.2 Please reproduce Table 5 of BCUC IR 183.3, replacing the two DSM $ budget columns (F2018 and F2019) with a single column showing the DSM budget for three years from F2017–F2019.

3.339.2.1 For each of the DSM programs in the table, please explain (i) whether the program is designed to obtain "36 days of curtailment of 16-hours per day" and (ii) whether similar programs are offered in other jurisdictions.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.339.2.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.2 Please reproduce Table 5 of BCUC IR 183.3, replacing the two DSM $ budget columns (F2018 and F2019) with a single column showing the DSM budget for three years from F2017–F2019.

3.339.2.2 For each DSM program designed to obtain "36 days of curtailment of 16-hours per day," please quantify the incentive paid to the customer in $/MW-year. Please provide supporting documentation, and explain whether this is lower than the long-term supply side cost of generation capacity.

RESPONSE:

Many of the initiatives are not yet at the stage where we are attempting to test the pricing that would be required to solicit different levels of participation and MW savings. Pricing will be incorporated into pilot activities as we increase the scale from these initial trials. For both the Residential Demand Response Trials and the Commercial and Industrial Demand Response initiatives the key objectives included testing out specific technologies and end-uses, as well as any customer issues or impacts related to using the technologies. For these demand response activities the incentive that was offered was to garner interest in participation, rather than test a price reflecting the product they could potentially offer.

- **In the residential trial we offered customers $40/year to participate in the hot water tank trials. We had 133 customers participate over the three years of the trial. In addition, 36 customers received new hot water tanks to test out a new**

technology. The $/MW-year will be determined after evaluating the results for the three-year period that ended in March 2017. The $40/year was based on internal discussions of what would be needed to garner interest. We received enough interest at the $40/year price to run the trial.

- **In the commercial and industrial demand response trials, after internal discussions on what price to offer to garner interest for commercial and industrial customers to participate in a trial, we offered $250/MW-year which enabled us to operate the trial with 11 customers (15 sites) participating. In addition to the price per MW-year, BC Hydro provided support to participating customers to implement controls and develop a set of actions to facilitate demand response activities.**

The one area where we did incorporate pricing into the pilot activities was Industrial Load Curtailment Pilot. For this initiative, we used the cost of a single-cycle gas turbine to represent the long-term supply side cost of generation capacity. The value of the single-cycle gas turbine was $88,000/MW-year, which was the marginal resource at the time. The business case for the Load Curtailment pilot (Attachment 1 to BC Hydro's response to BCUC IR 2.318.1.1) explains how this number was discounted to reflect the need for capacity products for only the winter and shoulder seasons. The resulting incentive offer in the Industrial Load Curtailment Pilot was $75,000/MW-year for a 16-hour product for 36-days.

339.0 Response to BCSEA

Reference: CAPACITY FOCUSED DSM
Exhibit B-20, Section 1.3, pp. 9–10; Exhibit B-9, BCUC IR 183.3
Curtailment frequency and duration

BC Hydro states on pages 9 and 10 of its Rebuttal Evidence:

> BC Hydro's pilot program focuses on a product for planning purposes and potential deferment of long-term generation assets, which has been defined as 36 days of curtailment of 16-hours per day. … While capacity-only demand side management programs and pilots are common in the industry, as far as BC Hydro is aware, no other jurisdiction has run a pilot or program for the product that BC Hydro requires to meet its system needs (36 days of curtailment of 16-hours per day).

BC Hydro described its capacity DSM programs in Table 5 of BCUC IR 183.3.

3.339.3 For each of the DSM capacity programs identified in BCUC IR 183.3, does BC Hydro consider that, if the pilot program were to become permanent, (i) it would meet the definition of a rate and (ii) DSM costs would be limited to rate implementation/administration and exclude the incentive? Please explain.

RESPONSE:

BC Hydro believes that demand-side management capacity-related programs are considered DSM programs and do not meet the definition of a rate. The demand-side management costs for the capacity programs include all costs related to the program, including for example implementation, administration and any incentive costs. The demand-side management capacity focused programs do not involve a charge to customers for a service supplied by BC Hydro; rather, BC Hydro is compensating customers in exchange for reducing or shifting their demand for electricity.

340.0 Response to BCSEA

Reference: LOW-CARBON ELECTRIFICATION
Exhibit B-20, Section 1.4, p. 11
Greenhouse Gas Reduction (Clean Energy) Regulation, Order in Council No. 101

The Greenhouse Gas Reduction (Clean Energy) Regulation, Order in Council No. 101 includes as a prescribed undertaking a program to encourage the public utility's customers, or persons who may become customers of the public utility, to use electricity instead of other sources of energy that produce more greenhouse emissions (subject to certain conditions).

3.340.1 Does BC Hydro consider that there is the potential for DSM low-carbon electrification programs that would not place upward pressure on rates? Please explain.

RESPONSE:

Yes, per the cost-effective definition in Order in Council No. 101, we anticipate that expenditures for low-carbon electrification programs will not place upward pressure on rates during the 2013 10 Year Rates Plan period. We anticipate the incremental revenues gained over this period will exceed the costs of the programs.

340.0 Response to BCSEA

Reference: LOW-CARBON ELECTRIFICATION
Exhibit B-20, Section 1.4, p. 11
Greenhouse Gas Reduction (Clean Energy) Regulation, Order in Council No. 101

The Greenhouse Gas Reduction (Clean Energy) Regulation, Order in Council No. 101 includes as a prescribed undertaking a program to encourage the public utility's customers, or persons who may become customers of the public utility, to use electricity instead of other sources of energy that produce more greenhouse emissions (subject to certain conditions).

3.340.1.1 Does BC Hydro plan to file a supplemental DSM expenditure schedule in support of Order in Council No. 101? Please explain.

RESPONSE:

No, BC Hydro does not plan to file a supplemental demand-side management expenditure schedule. Please refer to BC Hydro's response to BCSEA IR 3.67.7 for additional context. However, BC Hydro will file in its future revenue requirement applications, or other application as appropriate, information describing its electrification undertakings pursuant to OIC No. 101.

341.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 24
Sensitivity of LNG

In response to AMPC IR 2.2.1 in Exhibit B-15-2, BC Hydro presents a sensitivity comparison of two forecast model results, one with and one without the assumed LNG developments and associated upstream gas production. Table A compares the base case with the "without LNG developments" sensitivity case (Case 1). Table B compares the base case with the "only LNG-related developments" sensitivity case (Case 2) (i.e., without natural gas production unrelated to LNG development).

On page 24 of Exhibit B-20, BC Hydro states that "AMPC is isolating one factor among many – i.e., gas production – that go into the economic forecast in order to draw conclusions about the nature of the British Columbia natural gas industry and its dependence on LNG. It is methodologically incorrect to apply a broad-based economic analysis in the way AMPC has done."

BC Hydro further states that:

> The similarity in the base case and Case 2 on a province-wide basis (with only slight differences for the North Region) actually shows that the Fairholm Economic Model:
>
> - Is driven by a range of economic drivers well beyond the impacts associated with natural gas production in the province; and
> - The economic impacts are relatively insensitive to the range of natural gas production values that were used in the analysis, namely the difference in production estimates between the base case and Case 2 (i.e., without natural gas production growth unrelated to LNG development).

3.341.1 Please confirm whether the results presented in Table 1 through 3 by BC Hydro in response to AMPC IR 2.2.1 can be relied on for making any inference on the effect of LNG on the economic drivers.

RESPONSE:

BC Hydro can confirm that the three scenario tables show the impact on the economic drivers that come from the Fairholm model for various different

treatments of LNG including: Table 1 No LNG considered, Table 2: Only LNG development considered and Table 3: LNG considered and Site C removed.

BC Hydro believes the Fairholm results can be used to make inference on the economic drivers for each respective case given the inputs provided for the various cases. The inference from the Fairholm model is that economic drivers are relatively insensitive to the LNG assumptions provided, when considered on a province wide basis during the test period.

341.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 24
Sensitivity of LNG

In response to AMPC IR 2.2.1 in Exhibit B-15-2, BC Hydro presents a sensitivity comparison of two forecast model results, one with and one without the assumed LNG developments and associated upstream gas production. Table A compares the base case with the "without LNG developments" sensitivity case (Case 1). Table B compares the base case with the "only LNG-related developments" sensitivity case (Case 2) (i.e., without natural gas production unrelated to LNG development).

On page 24 of Exhibit B-20, BC Hydro states that "AMPC is isolating one factor among many – i.e., gas production – that go into the economic forecast in order to draw conclusions about the nature of the British Columbia natural gas industry and its dependence on LNG. It is methodologically incorrect to apply a broad-based economic analysis in the way AMPC has done."

BC Hydro further states that:

> The similarity in the base case and Case 2 on a province-wide basis (with only slight differences for the North Region) actually shows that the Fairholm Economic Model:
>
> - Is driven by a range of economic drivers well beyond the impacts associated with natural gas production in the province; and
> - The economic impacts are relatively insensitive to the range of natural gas production values that were used in the analysis, namely the difference in production estimates between the base case and Case 2 (i.e., without natural gas production growth unrelated to LNG development).

3.341.1 Please confirm whether the results presented in Table 1 through 3 by BC Hydro in response to AMPC IR 2.2.1 can be relied on for making any inference on the effect of LNG on the economic drivers.

3.341.1.1 If yes, please explain the methodologically correct way to interpret the data presented in Table A and Table B in response to AMPC IR 2.2.1.

RESPONSE:

BC Hydro was unsure whether the question was intended to refer to "Table A and Table B" or "Table 1 and Table 2". We have provided both explanations in this response.

Table A and Table B

Table A is BC Hydro's inputs to the March 2015 Fairholm Economic model results used to develop the May 2016 Load Forecast in terms of LNG export gas production, construction investment of LNG and pipeline composite projects and B.C.-based construction employment associated with LNG and pipeline composite projects. Fairholm did not use table A to develop the economic forecast for Case 1 No LNG.

Table B is the Montney, Horn River and Laird shale gas production under the assumption there is no LNG and associated pipeline development. This was provided to Fairholm to construct the economic forecast results for Case 1 (No LNG) as provided in Table 1 attached to BC Hydro's revised response to AMPC IR 2.2.1.

To develop the economic forecast scenario for Case 1 (No LNG), the inputs from Table A were replaced with Table B.

Table 1 and Table 2

Table 1 is Fairholm Economic model's results for the base case and the Case 1 (No LNG). Table 2 is Fairholm Economic model's results for the base case and the Case 2 (Only LNG development and LNG upstream production), where the inputs to generate the economic forecast results for Case 2 are provided in Table C.

The economic forecast results for both Case 1 and Case 2 are close to the base case on a provincial level due to the fact that most of the LNG and upstream gas production impact is localized in the drivers for the North Region. For example, as shown in Table 1, the average employment growth in B.C. for the 20 years forecast is 1.2 per cent for base case, Case 1 and Case 2; while the long-term average employment growth in the North Region is 1.6 per cent in the base case compared to 1 per cent in Case 1 and 1.6 per cent in Case 2.

341.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 24
Sensitivity of LNG

In response to AMPC IR 2.2.1 in Exhibit B-15-2, BC Hydro presents a sensitivity comparison of two forecast model results, one with and one without the assumed LNG developments and associated upstream gas production. Table A compares the base case with the "without LNG developments" sensitivity case (Case 1). Table B compares the base case with the "only LNG-related developments" sensitivity case (Case 2) (i.e., without natural gas production unrelated to LNG development).

On page 24 of Exhibit B-20, BC Hydro states that "AMPC is isolating one factor among many – i.e., gas production – that go into the economic forecast in order to draw conclusions about the nature of the British Columbia natural gas industry and its dependence on LNG. It is methodologically incorrect to apply a broad-based economic analysis in the way AMPC has done."

BC Hydro further states that:

> The similarity in the base case and Case 2 on a province-wide basis (with only slight differences for the North Region) actually shows that the Fairholm Economic Model:
>
> - Is driven by a range of economic drivers well beyond the impacts associated with natural gas production in the province; and
> - The economic impacts are relatively insensitive to the range of natural gas production values that were used in the analysis, namely the difference in production estimates between the base case and Case 2 (i.e., without natural gas production growth unrelated to LNG development).

3.341.1 Please confirm whether the results presented in Table 1 through 3 by BC Hydro in response to AMPC IR 2.2.1 can be relied on for making any inference on the effect of LNG on the economic drivers.

3.341.1.2 If not, please explain the basis of BC Hydro's statements regarding the similarity in the base case and Case 2 as quoted in the preamble.

RESPONSE:

Please refer to BC Hydro's response to BCUC IRs 3.341.1 and 3.341.1.1.

341.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 24
Sensitivity of LNG

In response to AMPC IR 2.2.1 in Exhibit B-15-2, BC Hydro presents a sensitivity comparison of two forecast model results, one with and one without the assumed LNG developments and associated upstream gas production. Table A compares the base case with the "without LNG developments" sensitivity case (Case 1). Table B compares the base case with the "only LNG-related developments" sensitivity case (Case 2) (i.e., without natural gas production unrelated to LNG development).

On page 24 of Exhibit B-20, BC Hydro states that "AMPC is isolating one factor among many – i.e., gas production – that go into the economic forecast in order to draw conclusions about the nature of the British Columbia natural gas industry and its dependence on LNG. It is methodologically incorrect to apply a broad-based economic analysis in the way AMPC has done."

BC Hydro further states that:

> The similarity in the base case and Case 2 on a province-wide basis (with only slight differences for the North Region) actually shows that the Fairholm Economic Model:
>
> - Is driven by a range of economic drivers well beyond the impacts associated with natural gas production in the province; and
> - The economic impacts are relatively insensitive to the range of natural gas production values that were used in the analysis, namely the difference in production estimates between the base case and Case 2 (i.e., without natural gas production growth unrelated to LNG development).

3.341.2 Please explain how BC Hydro would interpret the difference between the economic drivers in the base case and Case 1 (without LNG) as shown in Table A in response to AMPC IR 2.2.1.

RESPONSE:

The difference in the economic drivers between base case and Case 1 (No LNG) is the result of replacing the base case inputs with Table B inputs. This in effect is removing the export LNG production and upstream gas production associated with LNG export production from the base case.

342.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 26
Sensitivity of LNG

On page 26 of Exhibit B-20, BC Hydro states that:

> For example, for sensitivity Case 1 in the response to AMPC IR 2.2.1, where employment and capital spending impacts from LNG are removed from the Fairholm economic forecast, BC Hydro's revised North Region Statistically Adjusted End Use model projections indicate that the total decline in the combined residential and commercial distribution sales relative to the May 2016 Load Forecast is 1 GWh in fiscal 2017 or 0.0 per cent, 10 GWh or 0.0 per cent in fiscal 2018, 39 GWh or -0.1 per cent in fiscal 2019

3.342.1 Please confirm, or explain otherwise, that the results referenced above are produced by replacing economic drivers in the North Area under the base case with those under Case 1 (as presented in Table A of AMPC IR 2.2.1), and re-running the load forecast model used for the residential and commercial sales forecast in the North Area.

RESPONSE:

Confirmed, with the exception that BC Hydro did not update the accounts projection for the North Region using the housing starts forecast from Case 1 (No LNG). BC Hydro provides the following explanation:

The difference in the sales forecasts mentioned above are calculated by taking the difference between:

1. **North Region SAE models projections using the economic forecast results from the base case, and**

2. **North Region SAE models projections using the economic forecast results from Case 1 (No LNG).**

The economic forecast results for the North Region for the base case and Case 1 (No LNG) are summarized in Table 1 – Case 1 No LNG Development and associated gas production.

We note that in developing the economic results for Case 1 (No LNG), the inputs shown in Table A (for the base case) were replaced with the inputs shown in Table B.

For the purpose of developing the revised North Region residential sales forecast for Case 1 (No LNG), BC Hydro did not update the accounts projection for the North Region using the housing starts forecast from Case 1 (No LNG) because there was a small difference in particular over the test years in housing starts between Case 1 (No LNG) and the base case.

342.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 26
Sensitivity of LNG

On page 26 of Exhibit B-20, BC Hydro states that:

> For example, for sensitivity Case 1 in the response to AMPC IR 2.2.1, where employment and capital spending impacts from LNG are removed from the Fairholm economic forecast, BC Hydro's revised North Region Statistically Adjusted End Use model projections indicate that the total decline in the combined residential and commercial distribution sales relative to the May 2016 Load Forecast is 1 GWh in fiscal 2017 or 0.0 per cent, 10 GWh or 0.0 per cent in fiscal 2018, 39 GWh or -0.1 per cent in fiscal 2019

3.342.2 Please clarify whether the results presented above reflects the impact to the load forecast in the North Region, or in the whole BC Hydro system.

RESPONSE:

The results are for the North Region. However, as noted in our rebuttal evidence the sensitivity analysis also included the total system impact on the light industrial sector.

342.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 26
Sensitivity of LNG

On page 26 of Exhibit B-20, BC Hydro states that:

> For example, for sensitivity Case 1 in the response to AMPC IR 2.2.1, where employment and capital spending impacts from LNG are removed from the Fairholm economic forecast, BC Hydro's revised North Region Statistically Adjusted End Use model projections indicate that the total decline in the combined residential and commercial distribution sales relative to the May 2016 Load Forecast is 1 GWh in fiscal 2017 or 0.0 per cent, 10 GWh or 0.0 per cent in fiscal 2018, 39 GWh or -0.1 per cent in fiscal 2019

3.342.2 Please clarify whether the results presented above reflects the impact to the load forecast in the North Region, or in the whole BC Hydro system.

3.342.2.1 If it is for the whole system, please explain why BC Hydro only revised the North Region Statistically Adjusted End Use model projections.

RESPONSE:

The results presented above reflect the impact to the load forecast in the North Region, as described in BC Hydro's response to BCUC IR 3.342.2. Please refer to BC Hydro's response to BCUC IR 3.342.2.2.1 for the results for the entire system.

342.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 26
Sensitivity of LNG

On page 26 of Exhibit B-20, BC Hydro states that:

> For example, for sensitivity Case 1 in the response to AMPC IR 2.2.1, where employment and capital spending impacts from LNG are removed from the Fairholm economic forecast, BC Hydro's revised North Region Statistically Adjusted End Use model projections indicate that the total decline in the combined residential and commercial distribution sales relative to the May 2016 Load Forecast is 1 GWh in fiscal 2017 or 0.0 per cent, 10 GWh or 0.0 per cent in fiscal 2018, 39 GWh or -0.1 per cent in fiscal 2019

3.342.2 Please clarify whether the results presented above reflects the impact to the load forecast in the North Region, or in the whole BC Hydro system.

3.342.2.2 If it is not for the whole system, please explain the rationale for not providing results for the whole systems.

RESPONSE:

BC Hydro did not update the entire system because the revised inputs for Case 1 No LNG were localized in the North Region. As such, we anticipated that the resulting changes in the economic forecast for Case 1 would mostly impact the residential and commercial load forecast for this region.

Please refer to BC Hydro's response to BCUC IR 3.342.2.2.1 for the results for the whole system.

342.0 Response to AMPC

Reference: LOAD AND REVENUE FORECAST
Exhibit B-15-2, AMPC IR 2.2.1; Exhibit B-20, p. 26
Sensitivity of LNG

On page 26 of Exhibit B-20, BC Hydro states that:

> For example, for sensitivity Case 1 in the response to AMPC IR 2.2.1, where employment and capital spending impacts from LNG are removed from the Fairholm economic forecast, BC Hydro's revised North Region Statistically Adjusted End Use model projections indicate that the total decline in the combined residential and commercial distribution sales relative to the May 2016 Load Forecast is 1 GWh in fiscal 2017 or 0.0 per cent, 10 GWh or 0.0 per cent in fiscal 2018, 39 GWh or -0.1 per cent in fiscal 2019

3.342.2.2.1 Please provide the results for the whole system if it can be produced within reasonable efforts. If not provided, please explain any difficulties and constraints in producing it, and comment on whether the results would differ from those presented in on page 26 of the rebuttal evidence.

RESPONSE:

The results below shows the difference between the May 2016 forecast domestic sales forecast (i.e., for the entire system) and a scenario forecast of domestic sales using the economic drivers from Case 1 (No LNG) on a billed basis after demand side management. The notes to the table below provide further commentary.

Fiscal Year	Difference[1] (GWh)	Difference[1] (%)
F2017	**(21)**	**-0.04**
F2018	**(44)**	**-0.09**
F2019	**(82)**	**-0.16**
F2036	**(276)[2]**	**-0.41**

Note:

1. **The residential forecast for the scenario forecast for Case 1 (No LNG) for all regions was developed using the same accounts forecast as the May 2016**

forecast and the revised Statistically Adjusted SAE models projections using economic drivers from Case 1 (No LNG).

In our rebuttal evidence, Exhibit B-20, we had indicated our expectation that the residential/commercial impact would largely be confined to the North Region. The analysis we subsequently completed indicates that there were additional impacts in other parts of our service territory. The result is still immaterial.

2. **As shown above, the difference between the May 2016 forecast and Case 1 (No LNG) with the total system impact long term (i.e., all regions and including total system industrial distribution) by fiscal 2036 is (276 GWh). As stated in BC Hydro's rebuttal evidence, Exhibit B-20, the difference is (284 GWh) for the North Region only and total system industrial distribution. The total system impact difference is slightly lower because in some regions there was a positive change in some of the economic drivers which put upward pressure on forecast results for Case 1 (No LNG). The fact the model had increased in economic drivers for some regions for Case 1 (No LNG) is attributed to the simultaneous model convergence for all 15 regions but is not considered to be statistically significant.**

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.1 Please explain why BC Hydro selected March 31, 2025, as the appropriate date to fully depreciate all remaining assets at Burrard.

RESPONSE:

As indicated in the response to BCUC IR 1.152.10, March 31, 2025 was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility. Given the critical nature of the generator, using the depreciation rate of the generator was a reasonable approximation for the useful life of the remaining assets at Burrard.

As discussed in BC Hydro's response to BCUC IR 3.343.4, the specific depreciation rates selected on the remaining assets at Burrard do not have a material impact on our revenue requirements.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.2 Are there any assets which are not affected by the generators' synchronous condenser operations (e.g. C82504 Loader/Backhoe)?

RESPONSE:

The generating assets which are not required for synchronous condense operation have been fully depreciated. All remaining assets currently at the facility are required to perform and support the synchronous condenser functions. The assets at the Burrard Facility that are not physically involved with the synchronous condenser function but are needed to support this function are listed as an attachment to this response.

The Loader/Backhoe referenced in the question serves the function of maintaining access roads and the yard.

Support Assets for Synchronous Condenser Function
(in thousands)

Asset Class	Asset Class Description	Asset No.	Asset Description	Net Book Value (Mar. 31, 2016)
C11501	Land Fee Simple	1007274	PTN PL23961 SEC30 TWP39 NWD	15.4
		1007294	PTN PL23961 SEC 31 TWP39 NWD	15.4
		1007317	PTN PL23961 DL234 GP1 NWD	15.4
		1007336	PTN PL23961 SEC13 TWP39 NWD	15.4
		1007358	PTN PL23961 SEC24 TWP39 NWD	15.4
C12002	Road, Paved / Gravel	1068851	Road, Paved / Gravel	70.5
		1068865	Road, Paved / Gravel	0.1
		1068878	Road, Paved / Gravel	6.3
		1068891	Road, Paved / Gravel	1.3
C12203	Bridge, Concrete	1119720	Access Road Bridge	107.8
C12401	Drainage System Yard	1068982	Drainage System, Yard	49.1
		1068995	Drainage System, Yard	0.0
		1069008	Drainage System, Yard	4.4
		1069020	Drainage System, Yard	0.9
C21901	Roofs	1002224	Roofs, various	261.0
		1004218	STN, Roof, elec. shop	11.9
C22001	Plant, Concrete or Steel	1069127	STN, Workshop, mtc, mech	373.3
C22002	Commercial, Concrete or Steel	1009823	Bldg, sandblast/pressure wash	117.8
C22005	Building, Composite Pool	1002258	STN, Bldg, C&A, HVAC	26.0
		1005678	Superstructure, turbine bldg	14,990.7
		1005764	STN, Bldg, C&A	514.4
		1005935	STN, Bldg, storage, paint	3.5
		1006248	Excavation	0.1
		1006421	STN, Water treatment plant	4.4
		1006505	STN, Pumphouse, fuel oil	1.0
		1006610	STN, System, lighting & power	42.2
		1007267	STN, Elevator, C&A Bldg	49.8
		1008630	STN, Camera, security, Store11	1.2
		1009044	STN, bldg, lighting	0.2
		1009134	STN, bldg pwr distribution	0.6
		1017205	STN, Bldg, Annex	751.3
		1018045	STN, Htg, Vent, Air Con (HVAC)	13.8
		1040224	G1, Lighting	27.5
		1055486	Building, Training Centre	7.1
C22006	Equipment Shelter	1061137	Equipment Shelter	32.3
C22009	Building-HVAC Systems & Components	1108941	"Superstructure, turbine bldg"	87.5
		1108949	"STN, Bldg, C&A"	47.5
		1109015	"STN, Pumphouse, fuel oil"	0.0
		1109028	"STN, System, lighting & power"	0.2
		1109196	"STN, bldg, lighting"	0.0
		1109200	"STN, bldg pwr distribution"	3.9
		1109882	"STN, Bldg, Annex"	1.2
		1109885	"STN, System, alarm, plant evac"	0.2
		1112625	"Building, Training Centre"	0.1

Asset Class	Asset Class Description	Asset No.	Asset Description	Net Book Value (Mar. 31, 2016)
C22101	Office Trailer/Mobile Home	1002324	STN, Warehouse & lunchroom upg	464.2
		1004546	Tent	12.0
		1012340	Bldg, office, portable	46.0
C23801	Cranes	1006198	STN, Crane, travelling, ohd	5.5
		1006225	STN, Crane, travelling, ohd	5.5
C25101	Structure Support Steel	1008979	Structure, Support, Steel	579.5
		1009003	Structure, Support, Steel	283.0
		1009026	Structure, Support, Steel	69.0
		1009048	Structure, Support, Steel	159.6
		1009069	Structure, Support, Steel	48.3
		1016149	Structure, Support, Steel	457.0
		1068707	Structure, Support, Steel	618.6
		1073333	Structure, Support, Steel	87.9
C25301	Foundations	1008906	Foundations	52.5
		1008931	Foundations	0.3
		1008956	Foundations	5.4
		1016127	Foundations	79.3
		1068640	Foundations	168.0
		1068653	Foundations	12.3
C31001	Water Intake/Discharge Structure	1011440	STN, System, hoisting platform	64.2
C61001	Fencing	1068798	Fencing	30.8
		1068810	Fencing	0.0
		1068823	Fencing	3.2
		1068837	Fencing	109.4
C62001	Fire Protection System	1009349	Fire Protection System	2.6
		1022569	Fire Protection System	85.5
C62501	Firefighting Equip	1052451	Firefighting Equipment	0.5
C68904	Telephone System Cell	1126593	VOIP & UC Implementation, Burrard Th	74.2
C70104	Instrumentation-Digital	1108833	"Tools/Work Equipment, Misc"	0.2
		1108934	"Tools/Work Equipment, Misc"	0.2
		1110655	"Tools/Work Equipment, Misc"	0.1
		1111303	"Tools/Work Equipment, Misc"	3.5
		1112340	"Tools/Work Equipment, Misc"	1.2
		1112622	"Tools/Work Equipment, Misc"	1.6
		1113043	"Tools/Work Equipment, Misc"	2.6
C82504	Loader / Backhoe	1117587	Backhoe loader	92.9

Asset Class	Asset Class Description	Asset No.	Asset Description	Net Book Value (Mar. 31, 2016)
C82550	Tools/Work Equipment - Miscellaneous	1027650	Tools/Work Equipment, Misc	1.7
		1039396	Tools/Work Equipment, Misc	62.0
		1055456	Tools/Work Equipment, Misc	16.1
		1060369	Tools/Work Equipment, Misc	33.6
		1102961	BGS - F10 Tools & Work Equipment	77.3
		1103861	BGS - F11 Tools & Work Equipment	22.7
		1107807	BGS - F12 Tools & Work Equipment	41.5
		1117588	BGS Tools & Work Equipment	16.5
		1125076	Arc Flash Suits Equipment	9.8
		1125077	Electrical Test Equipment	17.6
		1125078	Doble F6150 Auto Relay Test Set	12.2
		1125079	Sump Oil Detector	9.2
		1125080	Video Conference Equipment	24.4
		1125592	BGS Remote Racking	40.1
		1127187	Laser Shaft Alignment Tool	14.0
		1127188	Tailgate - Mounted Salt/Sand Spreader	5.8
		1127189	Doble Relay Testing Set	62.9
C82551	Tools/Work Equipment	1004196	Tools/Work Equipment, Misc	11.5
		1016578	Tools/Work Equipment, Misc	48.2
		1020914	Tools/Work Equipment, Misc	31.7
		1022956	Tools/Work Equipment, Misc	2.6
		1032675	Tools/Work Equipment, Misc	16.6
		1046241	Tools/Work Equipment, Misc	40.9
C85001	Office Furniture	1021856	Furniture & Equipment, Office	7.6
		1021919	Furniture & Equipment, Office	4.9
C85002	Office Equipment	1025271	Furniture & Equipment, Office	0.7
C88002	Lab Equipment, Miscellaneous	1022816	Lab Equipment, Misc	16.6
H00004	Held for Sale - Land	1007252	PTNS LOTS 5,12,13&14 OF S19,TP	15.4
Grand Total				21,978.4

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.2 Are there any assets which are not affected by the generators' synchronous condenser operations (e.g. C82504 Loader/Backhoe)?

3.343.2.1 If yes, please identify them and explain the rationale for these assets being fully depreciated by March 31, 2025.

RESPONSE:

Please refer to the attachment to BC Hydro's response to BCUC IR 3.343.2 for a description of the assets that support the synchronous condenser function.

Direction No. 7, Appendix B – Burrard Depreciation Rates reflects BC Hydro's assessment of the assets within the fixed asset module that were assigned to the location of Burrard Generating Station. The assets identified as being used solely for generation had their assets lives updated so that they would be fully depreciated by March 31, 2016. The remaining assets needed to perform or

support the synchronous condenser function and their assets lives were updated so that they would be fully depreciated by March 31, 2025. Please refer to BC Hydro's response to BCUC IR 3.343.1 for the rationale for the March 31, 2025 date.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.3 Does BC Hydro anticipate having synchronous condensers at Burrard post 2025?

RESPONSE:

BC Hydro has identified a number of potential alternatives to provide the voltage compensation required for the operation of the Transmission system post fiscal 2025 when the existing synchronous condensers at the Burrard Facility are expected to reach the end of their useful life. The alternatives include shunt capacitors in the Lower Mainland, increased series compensation in the Interior to Lower Mainland Transmission system, and new synchronous condenser installation at a redeveloped Burrard location. A decision on the needed capital investments is not expected until late fiscal 2018 at the earliest.

The March 31, 2025 date for depreciating the remaining assets at the Burrard Facility is based on a conservative estimate of the remaining useful life of the generators, without consideration for the future capital investments that will be needed to provide the compensation required on the Transmission system post 2025.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.3.1 Does BC Hydro expect to require compensation at that location at that time, and/or does BC Hydro expect to replace the synchronous condensers with static VAR compensators or other passive compensation equipment at Burrard or elsewhere? Was this considered in selecting March 31, 2025? Please elaborate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.3.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.4 If BC Hydro had estimated the remaining life of each individual asset (or asset class) without consideration of the generators useful life, how would this impact depreciation expense and the total revenue requirement in F2017, F2018 and F2019? Would this approach result in a materially different revenue requirement than BC Hydro's approach?

RESPONSE:

Based on the remaining net book value as at March 31, 2016, and the original in-service dates and estimated useful lives, the annual depreciation expense would decrease by $411,500, if the useful lives were not adjusted so that all assets were fully depreciated by March 31, 2025. This is an annual decrease in BC Hydro Amortization of Capital Assets of 0.05 per cent.

This would not result in a materially different revenue requirement than BC Hydro's approach.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.5 For a similar facility such as Revelstoke, does BC Hydro depreciate all assets at that facility to match a conservative estimate of the remaining useful life of the generator assets? Please elaborate and compare the methodology used at Revelstoke to the methodology proposed for Burrard.

RESPONSE:

No, BC Hydro does not depreciate all assets at the Revelstoke facility to match a conservative estimate of the remaining useful life of the generator assets as there is no intention to change the use of the Revelstoke facility. In general, the assets at the Revelstoke facility follow the estimated life for that asset class found in BC Hydro's Asset Class Catalogue. The Burrard facility has been evaluated based on the next significant investment to determine the longer term strategy. Given the critical nature of the generator to the synchronous condenser function, using the depreciation rate of the generator was a reasonable approximation for the useful life of the remaining assets at Burrard.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.6 Please confirm, otherwise explain, that the four synchronous condensers in the asset class included in Table S-3 are in reference to the four synchronous condensers at Burrard.

RESPONSE:

Not confirmed.

The Asset Health Index (AHI) methodology described in Appendix S is used for Transmission and Distribution assets only. Per BC Hydro's response to BCUC IR 2.238.3, the four synchronous condensers in the asset class included in Table S-3 are in reference to the three synchronous condensers at the Vancouver Island Terminal Substation (VIT SC2, VIT SC3 and VIT SC4), and the synchronous condenser located at the Kelly Lake Substation (KLY SC2).

The four generating units converted to synchronous condenser operation during 2016 at the Burrard Synchronous Condenser Station remain Generation assets and are not included in the Asset Health Index in Table S-3.

The Asset Health Index for the synchronous condenser asset class, as shown in Table S-3, is 38 per cent Very Good and 62 per cent Very Poor. The Asset Health Index for an asset class is the aggregation of the Asset Health Index of each individual asset within the class. For the synchronous condenser asset class, the electrical/mechanical and protection systems at the four synchronous condenser installations are individually assessed for a total of eight systems. Table S-3 is based on three of the eight systems (38 per cent of the class) having an Asset Health Index rating of Very Good and five of the eight systems (62 per cent of the class) having an Asset Health Index rating of Very Poor. Please refer to paragraph (g) of BC Hydro's response to Landale IR 3.13.1 for further details.

Please refer to BC Hydro's response to BCUC IR 2.238.3 for information on the planned investments to restore the Transmission synchronous condenser assets to good health.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.6 Please confirm, otherwise explain, that the four synchronous condensers in the asset class included in Table S-3 are in reference to the four synchronous condensers at Burrard.

3.343.6.1 If not confirmed, please confirm these are the Vancouver Island Terminal (1) and Kelly Lake (3) synchronous condensers.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.6.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.6 Please confirm, otherwise explain, that the four synchronous condensers in the asset class included in Table S-3 are in reference to the four synchronous condensers at Burrard.

3.343.6.2 If confirmed, please further confirm, otherwise explain, that Table S-3 shows that 40 percent of the synchronous condensers asset class are considered to be in very good condition and 60 percent in very poor condition.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.6.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.6.2.1 Given there are only four assets, please explain how this is possible.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.6.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.7 Please elaborate on how the Asset Health Index methodology can be used to determine an engineering estimate of the remaining useful life of each synchronous condenser generator asset (e.g. for a very poor rated generator asset, overhaul or replacement may be required within three years).

RESPONSE:

For clarification, the synchronous condensers outlined in Table S-3 are not those at the Burrard Facility, as outlined in BC Hydro's response to BCUC IR 3.343.6.

As stated in BC Hydro's response to BCUC IR 3.343.8, the condition of the assets at the Burrard Facility were assessed separately to inform decisions about remaining useful life.

The Asset Health Index methodology used for Transmission and Distribution assets and described in Appendix S of the Application has not been used for the synchronous condenser generator assets at the Burrard Facility, so it is not known how the assets would be rated based on that methodology.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.8 Please confirm, otherwise explain, that prior to conversion to synchronous condense only mode, the generator assets at Burrard were evaluated using EHR or a comparable engineering methodology.

RESPONSE:

Not confirmed. The generator assets were not evaluated using the equipment health rating (EHR) methodology. EHR is not applied to thermal assets. The condition of these assets was assessed separately to inform decisions about remaining useful life.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.8 Please confirm, otherwise explain, that prior to conversion to synchronous condense only mode, the generator assets at Burrard were evaluated using EHR or a comparable engineering methodology.

3.343.8.1 If confirmed, please provide the ratings, the estimated remaining life, the findings and the recommendations provided in these evaluations. Please comment on any changes/actions taken post conversion and how these actions may have affected the estimated remaining useful life of the generators.

RESPONSE:

Not confirmed. Please refer to BC Hydro's response to BCUC IR 3.343.8.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.9 Please elaborate on how the Equipment Health Rating or a comparable methodology was used to determine an engineering estimate of the remaining useful life of the generators (e.g. a Poor rated generator may be expected to have major capital investment or be replaced in 10 to 12 years).

RESPONSE:

As stated in BC Hydro's response to BCUC IR 3.343.8, BC Hydro did not assess these assets using the Equipment Health Rating methodology. Instead, BC Hydro retained a third-party to evaluate the condition of the assets.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.10 Please confirm, otherwise explain, that the depreciation rates applied in F2015 and F2016 for assets that were not fully depreciated by the end of F2016 were based on the assumption that all remaining assets at the Burrard facility for the synchronous condensers function would be fully depreciated for accounting purposes by March 31, 2025.

RESPONSE:

Yes, the depreciation rates directed by Direction No. 7 for fiscal 2015 and fiscal 2016 for assets that were not fully depreciated by the end of fiscal 2016 were based on the assumption that all remaining assets eligible for depreciation (land is not depreciated) would be fully depreciated by March 31, 2025.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.10 Please confirm, otherwise explain, that the depreciation rates applied in F2015 and F2016 for assets that were not fully depreciated by the end of F2016 were based on the assumption that all remaining assets at the Burrard facility for the synchronous condensers function would be fully depreciated for accounting purposes by March 31, 2025.

3.343.10.1 If not confirmed, please provide those assumptions and explain why the F2017–F2019 assumptions are different than the F2015 and F2016 assumptions.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.10.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.11 Is the Burrard Facility Asset C30102 still used and useful?

RESPONSE:

The description of the asset found in Asset Class C30102 is Station Asbestos Abatement, which was put in-service on October 14, 1993. This asset may be the result of the large asbestos abatement work that was completed under the Burrard Upgrade Project. The breakdown of the equipment, areas abated and re-insulated, is not readily available.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.11 Is the Burrard Facility Asset C30102 still used and useful?

3.343.11.1 If yes, please explain why it is needed.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.11.

343.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Appendix S, Table S-3, p. 3; Appendix R;
Exhibit B-10, BCUC IR 152.10; Exhibit B-20, p. 32
Burrard remaining useful life

On page 32 of BC Hydro's rebuttal, BC Hydro explains: "The useful lives of the individual assets were adjusted to reflect the remaining useful life as a result of the change in use of the Burrard Facility. The adjusted remaining useful life was used as the basis to determine the depreciation for the assets."

In response to BCUC IR 152.10, BC Hydro explains:

> The depreciation rates for the test period are the rates required to be applied against the net book value of the assets at the beginning of each year assuming all remaining assets at the Burrard Facility for the synchronous condenser function will be fully depreciated for accounting purposes by March 31, 2025. This date was selected based on a conservative estimate of the remaining useful life of the generators, which are the most significant component of the remaining assets at the facility.

In Appendix S, BC Hydro describes its Asset Health Index (AHI) methodology and results. In Table S-3 BC Hydro provides the AHI for four synchronous condensers. In Appendix R, BC Hydro describes its Equipment Health Rating (EHR) methodology.

3.343.11 Is the Burrard Facility Asset C30102 still used and useful?

3.343.11.2 If not, please explain why it has not yet been fully depreciated.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.343.11.

344.0 Response to Landale

Reference: OTHER REVENUE REQUIREMENT ITEMS
Exhibit B-1-1, Section 8.1, pp. 8-1 – 8-2;
Basis for Burrard depreciation rates regulatory approval request

In section 8.1 of the Application BC Hydro explains:

> In this Application, BC Hydro is seeking approval for the depreciation rates of certain property, plant and equipment at [Burrard], as the rates prescribed by Direction No. 7 only included depreciation rates for fiscal 2015 and fiscal 2016. Table 8-1 provides the detailed depreciation rates for each year of the test period for which BC Hydro is seeking British Columbia Utilities Commission approval. The depreciation rates shown in Table 8-1 for a given fiscal year would be applied against the net book value of the asset at the beginning of that fiscal year.

3.344.1 Please confirm, otherwise explain, that BC Hydro is seeking Commission approval pursuant to UCA section 56(2) for the depreciation rates of certain property, plant and equipment at Burrard.

RESPONSE:

Not confirmed. BC Hydro is seeking approval for the depreciation rates under the rate approval provisions of the *Utilities Commission Act*, being sections 59 to 61. The depreciation rates set by the Commission determine the depreciation expense that is reflected in the forecast revenue requirements for the test period. Our requested approval is the standard approach in this jurisdiction.

345.0 Response to Zone II

Reference: RESPONSE TO EVIDENCE OF ZONE II RATEPAYERS GROUP
Exhibit B-20, Section 5, pp. 44, 47
Funding levels, reporting

BC Hydro states on page 47 of its Rebuttal Evidence that it does not believe increased reporting on Zone II DSM is required.

3.345.1 Please estimate DSM spending for F2014–F2016 and requested for F2017-F2019 for BC Hydro's non-integrated areas (NIA) as a percentage of NIA revenues received, and compare this to the BC Hydro's integrated areas.

RESPONSE:

The following table provides an estimate of demand-side management expenditures as a per cent of revenues for the non-integrated areas compared to BC Hydro's integrated areas.

	Expenditures (Fiscals 2014 – 2016) ($)	Percentage of Revenues (Fiscals 2014 – 2016) (%)	Expenditures (Fiscals 2017 – 2019) ($)	Percentage of Revenues (Fiscals 2017 – 2019) (%)
Non-Integrated Areas (Zone 1B and Zone II)	**346,900** [1]	**1.0**	**1.4 million** [2]	**2.9**
Integrated Areas (Zone I)	**389.8 million**	**3.1**	**373.6 million**	**2.6**

[1] This is only the direct expenditures as noted in BC Hydro's response to Zone II IR 1.19.3. Other expenditures are not tracked separately, so there are Zone I expenditures which create benefits that also flow to Zone 1B and Zone II.

[2] Since the Demand-Side Management Plan does not forecast expenditures by zone, BC Hydro made a simplifying assumption that the program uptake in each of fiscals 2017 to 2019 will match the expenditure level from fiscal 2016 of $321,000 per Zone II IR 1.19.3. In addition to program expenditures, BC Hydro's response to Zone II IR 2.38.5 outlines additional pilot activities, of which $460,000 are being undertaken in Zone 1B and Zone II.

345.0 Response to Zone II

Reference: RESPONSE TO EVIDENCE OF ZONE II RATEPAYERS GROUP
Exhibit B-20, Section 5, pp. 44, 47
Funding levels, reporting

BC Hydro states on page 47 of its Rebuttal Evidence that it does not believe increased reporting on Zone II DSM is required.

3.345.1.1 Does BC Hydro consider that the DSM spending as a percentage of revenues in the NIA should reasonably be different than those in the integrated area (for example, as a result of differences in avoided costs/emission reduction benefits, and as NIA customers may be 'harder to reach')? Please explain.

RESPONSE:

This response also responds to NIARG IRs 3.29.1, 3.29.2 and 3.29.3.

BC Hydro agrees that it is reasonable for demand-side management spending as a per cent of revenues in Non-Integrated Areas to be different than those in integrated areas.

When estimating the level of spend for demand-side management activities, BC Hydro considers the opportunities that exist in each market for cost effective energy savings, and the barriers to realising those opportunities. As a result, any subset of customers served by BC Hydro (whether Non-Integrated or integrated) is likely to have a different level of spending as a per cent of revenues compared to other customers, due to different markets, different opportunities and different barriers.

Factors that could lead to a higher level of spend in Non-Integrated Areas relative to integrated areas include the unique geographic and market barriers to participation in demand-side management activities in these communities. For example, the costs associated with implementing pilot activities to investigate new ways of increasing program participation in Non-Integrated areas would lead to higher costs in these communities than operational programs in the integrated areas. Conversely, these factors could justify lower expenditures in the integrated areas. It is uncertain what affect the different mixes of customer classes between Non-Integrated Areas and integrated areas would cause on this metric; this would depend on the specific opportunities under consideration.

BC Hydro believes it is reasonable for spending as a per cent of revenues for Non-Integrated Areas to be higher than integrated areas, as is shown to be the

case in BC Hydro's response to BCUC IR 3.345.1. That response also illustrates that we have made substantial increases in demand-side management spending in the Non-Integrated Area. This spending metric provides value by allowing a comparison between areas, but the metric itself is limited in that it cannot provide an assessment of the appropriate comparison ratio.

345.0 Response to Zone II

Reference: RESPONSE TO EVIDENCE OF ZONE II RATEPAYERS GROUP
Exhibit B-20, Section 5, pp. 44, 47
Funding levels, reporting

BC Hydro states on page 47 of its Rebuttal Evidence that it does not believe increased reporting on Zone II DSM is required.

3.345.2 Please explain why BC Hydro does not believe that it should "report annually on the implementation of its DSM programs in the NIA communities."

RESPONSE:

This response also responds to NIARG IR 3.29.5.

BC Hydro's believes that the ongoing engagement and feedback as described in BC Hydro's response to Zone II IR 3.56.3 will address Zone II's concerns. However if the Commission would like annual visibility into these activities, BC Hydro could add a line item to BC Hydro's Annual Report on DSM Activities to reflect the Non-Integrated Areas activities that are tracked separately.

As noted in BC Hydro's response to Zone II IR 1.19.1, our demand-side management programs are developed and implemented as province-wide offerings and not all of the activity is tracked such that expenditures or savings can be disaggregated by geographical area or rate zone. Please refer to BC Hydro's response to Zone II IR 1.19.3 for the types of costs, including incentives, that are tracked separately for Non-Integrated Areas and those that are not.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

In response to BCUC IRs 35.4 and 35.5, BC Hydro stated that variances between forecast and actual costs in "Services – ABSU" (Exhibit B-1-1, Appendix A, Tab 5S, line 2) were due to Tempworks and project and initiative work which is commonly planned for in "Services – Other" (Exhibit B-1-1, Appendix A, Tab 5S, line 3).

3.346.1 For clarity, please confirm that the termination of the ABSBC contract impacts line 2 of Tab 5S in Appendix A to the Application (i.e. F2017 forecast = $49.1M, F2018 forecast = $48.4M, F2019 forecast = $49.6M). If not confirmed, please explain and provide details for the correct impacted operating expense line(s).

RESPONSE:

Confirmed. The expiry of the ABSBC contract impacts line 2 of Schedule 5S in Appendix A to the Application.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

In response to BCUC IRs 35.4 and 35.5, BC Hydro stated that variances between forecast and actual costs in "Services – ABSU" (Exhibit B-1-1, Appendix A, Tab 5S, line 2) were due to Tempworks and project and initiative work which is commonly planned for in "Services – Other" (Exhibit B-1-1, Appendix A, Tab 5S, line 3).

3.346.2 Please clarify and explain the extent to which BC Hydro will continue to use Tempworks once the outsourcing contract with ABSBC terminates and what impact, if any, there is to forecast F2017-F2019 "Services – Other" costs from the termination of the ABSBC contract.

RESPONSE:

BC Hydro will not continue to use Tempworks once the outsourcing contract with ABSBC expires. The strategy for the replacement of services previously provided by Tempworks is currently being developed.

The expiry of the ABSBC contract, with respect to services currently provided by Tempworks, will result in a reallocation of costs from the "Services – ABSU" line item to the "Labour" and "Services – Other" line items.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

On page 51 of Exhibit B-20, BC Hydro states its best estimate at this time is "the net impact on revenue requirements for the current test period will be in the range of $0-2 million."

3.346.3 Please clarify whether the $0-2 million net impact on revenue requirements for the current test period is an increase or decrease. In addition, given that the ABSBC contract expires April 30, 2018, please also confirm whether the $0-2 million impact relates to F2019 only.

RESPONSE:

The net impact of $0-2 million is an estimated savings during the test period. Financial impacts and assumptions are currently being refined and have a degree of variability. BC Hydro expects to incur repatriation costs in fiscal 2018 and realize savings in fiscal 2019 for a net impact of $0 to $2 million over the test period.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

On page 51 of Exhibit B-20, BC Hydro states its best estimate at this time is "the net impact on revenue requirements for the current test period will be in the range of $0-2 million."

3.346.4 Were there any significant costs overruns in each of the past five fiscal years with ABSBC compared to the original forecast of payments to ABSBC? If yes, please explain the magnitude of the variance and provide an explanation as to why the variance occurred.

RESPONSE:

There were not any significant cost overruns with respect to the base services provided by ABSBC as part of the Master Services Agreement with BC Hydro. As discussed below, variances between forecast and actuals over the last five years have been primarily due to a transition to other service providers for the provision of technology services and the use of ABSBC for project work which is in addition to their base services.

The base services to be repatriated, including Customer Care, Human Resources, Financial Services and Office Services, are largely fixed price with adjustments for volumes and inflation. Because of this, the fees are predictable and variances related to these base services are minimal over the past five fiscal years.

For ease of reference we have summarized below the actual and forecast ABSBC costs for the past five years reported on line 2, Schedule 5S of Appendix A in prior revenue requirements applications. As described in the bullets below, the Actuals contain project costs that were forcasted on a different line of Schedule 5S of Appendix A, in addition to costs forecasted on line 2 related to the Master Services Agreement.

Services - ABSU

$ million

	F2012	F2013	F2014	F2015	F2016
Actuals	117.8	99.3	65.1	52.2	60.7
RRA	108.9	104.6	79.1	48.5	47.7
Variance	**-8.9**	**5.3**	**14.0**	**-3.7**	**-13.0**

Variances for line 2 of Schedule 5S of Appendix A, over the past five year are primarily related to the following:

- **Beginning in fiscal 2012, technology services were transitioned from ABSBC to other vendors. Transition costs incurred in fiscal 2012 were offset by savings in fiscal 2013 and fiscal 2014 as these costs moved from "Services – ABSU" to other cost categories;**

- **Over the period referenced in the table above, ABSBC also performed work for BC Hydro to support projects. Forecast project work is shown in the Services – Other, line 3 of Appendix A, Schedule 5S. Project work can be performed by various vendors. If the project work is performed by ABSBC, the actual costs are reflected in line 2 of Schedule 5S rather than line 3 where they were initially forecasted. While this is a contributing factor to variances in all years, it is the primary driver to the variances in fiscal 2015 and fiscal 2016; and**

- **Increased volume for various services to support short-term contract work.**

These variances described above were offset in part by variances between forecast and actual project costs in line 3 of Schedule 5S, Appendix A.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

On page 51 of Exhibit B-20, BC Hydro states its best estimate at this time is "the net impact on revenue requirements for the current test period will be in the range of $0-2 million."

3.346.4 Were there any significant costs overruns in each of the past five fiscal years with ABSBC compared to the original forecast of payments to ABSBC? If yes, please explain the magnitude of the variance and provide an explanation as to why the variance occurred.

3.346.4.1 If there were significant cost overruns in the past five years, please discuss if BC Hydro expects to achieve immediate and significant cost savings from repatriating ABSBC services and if not, why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 3.346.4.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

In response to BCUC IRs 35.4 and 35.5, BC Hydro stated that variances between forecast and actual costs in "Services – ABSU" (Exhibit B-1-1, Appendix A, Tab 5S, line 2) were due to Tempworks and project and initiative work which is commonly planned for in "Services – Other" (Exhibit B-1-1, Appendix A, Tab 5S, line 3).

3.346.5 Please discuss what cost savings, if any, BC Hydro anticipates in the long term (i.e. beyond the test period) from repatriating ABSBC services.

RESPONSE:

BC Hydro is filing this response in confidence with the BCUC. As BC Hydro and ABSBC are currently in negotiations on the wind-down of the outsourcing contract, this information is commercially sensitive.

346.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES (ABSBC) CONTRACT
Exhibit B-20, Section 6, pp. 50-52; Exhibit B-1-1, Appendix A, Tab 5S; Exhibit B-9, BCUC IR 35.4, 35.5
Financial information

Furthermore, BC Hydro states on page 51 of Exhibit B-20 it is "not requesting a new regulatory account or seeking to use an existing regulatory account for the deferral of costs or savings related to the termination of the Accenture contract…"

3.346.6 In the event that significant costs or savings materialize in the current test period due to the transition of ABSBC services, is there a possibility that BC Hydro will later request the costs or savings be captured in a regulatory account for future recovery/refund to ratepayers?

RESPONSE:

BC Hydro is not requesting a new regulatory account or seeking to use an existing regulatory account for the deferral of costs or savings related to the transition of the ABSBC contract over the test period, and does not anticipate any scenarios where this would change.

347.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES CONTRACT
Exhibit B-20, Section 6, p. 48
Quality of service

BC Hydro states on page 48 of Exhibit B-20:

> In February, 2017, BC Hydro's Board of Directors approved the repatriation of services upon the expiry of the outsourcing contract. An important consideration in BC Hydro's analysis was our key corporate objective of making it easier for customers to do business with us. The outsourcing contract includes our call centre agents, who are often the first contact with our customers. It also includes critical back office functions that ultimately have customer service implications. BC Hydro has made the decision to bring these functions back in-house so that we can adapt and grow these services and align them with our future business needs.

3.347.1 Please identify and explain all anticipated improvements related to the "key corporate objective of making it easier for customers to do business with us" which BC Hydro anticipates will arise from repatriating Accenture services.

RESPONSE:

Through the repatriation of these key customer facing services, we see that having direct control over the allocation of resources will provide operational flexibility and allow us to be more agile as we adapt to new business requirements that arise.

For context, since the initial outsourcing ABSBC has provided a scope of services defined within its contract, and in accordance with a series of Service Level Agreements that establish performance levels. BC Hydro and its customers benefitted by having a fixed price for services provided, with a price that declined over time in real terms, while ABSBC had a financial incentive to continue to drive efficiencies. This model of outsourcing worked very well throughout the contract because BC Hydro's business requirements were constant, and so ABSBC was able to focus on maximizing the efficiency of meeting the Service Level Agreements.

The downside to an outsourced contract model is that operational changes can be difficult to implement. As business requirements evolve with changes in technology and customer expectations, these adjustments in work and scope

require a detailed assessment of the impact on the service provider's operations and approval of a change order to the contract, often resulting in additional costs to BC Hydro. This process can take time, and can also present challenges in piloting new processes so that the benefits and impacts can be measured before committing to a permanent change. Additionally, in an outsourced model, when resource savings can be obtained from a change, the two parties typically share in any savings rather than the full savings being realized by the owner.

Repatriating the primary customer functions (i.e., the contact centre, billing and collections) will allow us to be more flexible in making operational changes that improve customer experience or provide cost savings.

As we look ahead, we need to consider what the call centre of the future looks like and developing and implementing this future model in house allows BC Hydro to take ownership for the strategy and outcomes.

347.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES CONTRACT
Exhibit B-20, Section 6, p. 48
Quality of service

BC Hydro states on page 48 of Exhibit B-20:

> In February, 2017, BC Hydro's Board of Directors approved the repatriation of services upon the expiry of the outsourcing contract. An important consideration in BC Hydro's analysis was our key corporate objective of making it easier for customers to do business with us. The outsourcing contract includes our call centre agents, who are often the first contact with our customers. It also includes critical back office functions that ultimately have customer service implications. BC Hydro has made the decision to bring these functions back in-house so that we can adapt and grow these services and align them with our future business needs.

3.347.1.1 What other management efficiencies from repatriating services does BC Hydro anticipate going forward? Please explain.

RESPONSE:

It is too soon for BC Hydro to identify specific management efficiencies that we anticipate from repatriating services. Our focus right now is to integrate the services and maintain the stability of operations. We will be looking at potential efficiencies as we progress towards repatriation and, in the future, after operations are in-house and stabilized.

347.0 Termination of Accenture Business Services

Reference: TERMINATION OF ACCENTURE BUSINESS SERVICES CONTRACT
Exhibit B-20, Section 6, p. 48
Quality of service

BC Hydro also stated on page 48 of Exhibit B-20 that it's "partnership with ABSCBC has been successful."

3.347.2 Please provide a further explanation of the statement "BC Hydro's partnership with ABSBC has been successful." Please discuss the advantages and disadvantages of the ABSBC model and the in-house model.

RESPONSE:

The outsourcing contract between BC Hydro and ABSBC has been successful. Some key advantages of the contract include cost savings through the fixed price for services provided, insight into global trends, willingness to be innovative within the outsourcing framework and our customer contact centre being recognized as world class. We have also had an open and collaborative partnership since the initial contract was signed in 2003.

As new technologies emerge and customer expectations evolve, operational changes within the confines of an outsourced contract can be difficult to implement. Adjustments in work and scope require a detailed assessment of the impact on the service provider's operations and approval of a change order to the contract, often resulting in additional costs to BC Hydro. This process can take time, and can also present challenges in piloting new processes so that the benefits and impacts can be measured before committing to a permanent change. Additionally, in an outsourced model, when resource savings can be obtained from a change, the two parties typically share in any savings rather than the full savings being realized by the owner.

Please also refer to BC Hydro's response to BCUC IR 3.347.1.

348.0 Termination of Accenture Business Services

Reference: TERMINATION OF ABSBC CONTRACT
Exhibit B-20, Section 6, p. 50
Risk mitigation

BC Hydro stated on page 50 of Exhibit B-20:

> The outsourcing contract includes the following services: Customer Care (customer call centre, billing, learning and knowledge, credit/collections); Human Resources (payroll, recruitment services, pension administration); Finance (accounts payable); Office Services (switchboard, mail and document services, and graphic design).

3.348.1 Recognizing the extensive outsourcing that BC Hydro undertook with ABSBC, please explain what steps BC Hydro has taken or will take to ensure that repatriation goes smoothly and is on-budget. Please provide the specific nature and design of the planned controls, processes, project team(s) or resources, and governance to efficiently manage the transition.

RESPONSE:

Following the decision to repatriate the services, BC Hydro established a project governance structure which includes two Executive Sponsors, a Steering Committee, Project Management Office (PMO) and leads for each functional area being repatriated. In addition, BC Hydro has identified internal support functions (e.g., Human Resources, Finance, Legal, etc.) and assigned leads from each of these functions to support the project team. Each lead will have resources assisting them in carrying out the required repatriation activities.

The PMO will lead the transition project and provide central coordination and direction for the functional areas and support groups involved in the project. The PMO will also ensure comprehensive work plans are in place, negotiate the wind down of legal obligations under the contract, and monitor progress and budget. Additionally, the PMO will provide regular status updates to the Steering Committee and Executive Sponsors.

The Steering Committee and Executive Sponsors will review regular financial and progress reports from the PMO and will provide approval on key decisions brought forward by the PMO.