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January 15, 2019

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Supply Chain Applications Project Phase Two Verification Report
Information Responses Round 1 to BCUC and Intervener

BC Hydro writes in compliance with Commission Order No. G-229-18 to provide its responses to Round 1 information requests as follows:

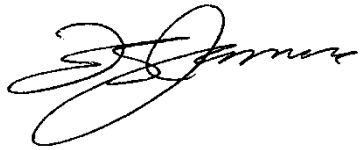
Exhibit B-3	Responses to Commission IRs (Public Version)
Exhibit B-3-1	Responses to Commission IRs (Confidential Version)
Exhibit B-4	Responses to Interveners IRs (Public Version)
Exhibit B-4-1	Responses to Interveners IRs (Confidential Version)
Exhibit B-5	Responses to Commission Confidential IRs

BC Hydro is filing a number of IR responses and/or attachments to responses confidentially with the Commission. BC Hydro provides an explanation for its request for confidential treatment in the public version of each IR response. BC Hydro seeks this confidential treatment pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

BC Hydro requests that any concerns regarding the adequacy of the IR responses, confidentially concerns, or other issues, be addressed to Christopher R. Bystrom at cbystrom@fasken.com.

For further information, please contact Geoff Higgins at 604-623-4121 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

cu/tl

Enclosure

1.0 A. INTRODUCTION AND REGULATORY REVIEW

Reference: INTRODUCTION AND REGULATORY REVIEW
Exhibit B-1 (Application), Section 1.5.3, pp. 1-13 to 1-14; Section 3.3, p. 3-18
Supply Chain Applications project reporting

On pages 1-13 to 1-14 of the Application, BC Hydro states:

BC Hydro proposes to file the Project's final completion report three months after receiving Board of Director's approval of the SCA Project's [Supply Chain Applications Project] final completion report. The final completion report will include a breakdown of the final costs of the SCA Project, updated benefit tracking information, and provide a detailed explanation and justification of any material cost, benefit, scope, and schedule variances.

In addition, on page 3-18 of the Application, BC Hydro states:

As part of its project-specific progress reporting, BC Hydro will provide updates on the benefits realization monitoring plan, which will include updates on planned baselines, metrics, and measures for tracking the realization of benefits.

1.1.1 Please provide the expected amount of time (i.e. length of time) between the in-service date of the project and the receipt of the Board of Director's approval.

RESPONSE:

It is expected the Board of Directors' approval will occur between 15 and 18 months after the in-service date of the project. The SCA Project's final completion report will not be prepared until the one-year stabilization and onboarding stages are complete. Once completed, the report will be presented to the Board of Directors.

BC Hydro expects to file the SCA Project's final completion report with the BCUC three to six months after the Project Completion date. BC Hydro will continue to file project-specific progress reports at the BCUC established frequency up until the final completion report is filed.

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1.1.1 Please provide the expected amount of time (i.e. length of time) between the in-service date of the project and the receipt of the Board of Director's approval.

1.1.1.1 If the expected amount of time is greater than three months, please discuss whether BC Hydro would be amenable to filing the SCA Project's final completion report with the BCUC three months after the in-service date of the project (i.e. absent Board of Director's approval). If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.1.

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As part of its project-specific progress reporting, BC Hydro will provide updates on the benefits realization monitoring plan, which will include updates on planned baselines, metrics, and measures for tracking the realization of benefits.

1.1.2 Please clarify whether or not BC Hydro intends to report on the realization of the SCA Project benefits beyond the final completion of the project in March 2021 (i.e. benefits tracking results).

RESPONSE:

BC Hydro intends to report on SCA Project benefits in future revenue requirements applications until the benefits have been fully realized, which is beyond the Project Completion date.

Please also refer to BC Hydro's response to BCUC IR 1.14.5.

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1.1.2 Please clarify whether or not BC Hydro intends to report on the realization of the SCA Project benefits beyond the final completion of the project in March 2021 (i.e. benefits tracking results).

1.1.2.1 If no, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.1.2.

1.0 A. INTRODUCTION AND REGULATORY REVIEW

Reference: INTRODUCTION AND REGULATORY REVIEW
Exhibit B-1 (Application), Section 1.5.3, pp. 1-13 to 1-14; Section 3.3, p. 3-18
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1.1.2 Please clarify whether or not BC Hydro intends to report on the realization of the SCA Project benefits beyond the final completion of the project in March 2021 (i.e. benefits tracking results).

1.1.2.2 If yes, please discuss the expected timing, content and proposed review process for this reporting.

RESPONSE:

BC Hydro will internally track and monitor the realization of the SCA Project benefits on an annual basis at least until benefits are fully realized. BC Hydro will report to the Commission on the realization of the SCA Project benefits in the Project Closure and Evaluation Report (PCER) as well as future revenue requirement applications until the benefits have been fully realized. The content of the reporting will be based on the benefit tracking sheets described on page 3-17 and included in Appendix I of the Verification Report.

2.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.1, pp. 2-1 to 2-2; Section 2.3.1.3, pp. 2-11 to 2-12; BC Hydro Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, Section 2.4.3, p. 2-18
Revised project cost range

On page 2-1 of the Application, BC Hydro states:

Based on the results of the Definition Phase activities, the revised estimated cost range for the SCA Project is $71.3 million to $79.3 million (Revised Project Cost Range). The lower end of the Revised Project Cost Range is the Expected Cost estimate (Expected Cost), while the upper end of the Revised Project Cost Range is the Authorized Cost estimate (Authorized Cost)….

On pages 2-11 to 2-12 of the Application, BC Hydro states that the Expected Cost has been assigned an estimating accuracy range of +15 percent / -10 percent similar to that in the Phase One Application. BC Hydro explains, "[w]hile the SCA Project has advanced considerably since the Phase One Application, an AACEI Class 3 estimating accuracy range is still appropriate given the size and complexity of the SCA Project."

On page 2-18 of the Phase One Application, BC Hydro stated that "[t]he low end of the Project Cost Range is known as the Lower Bound cost estimate. The Lower Bound cost estimate is calculated by discounting the sum of the future direct costs plus the 20 percent contingency by the lower end of the estimating accuracy range (-10 percent) as described in section 2.4.1."

1.2.1 Please discuss whether BC Hydro would consider it appropriate to establish a lower bound cost estimate of the SCA Project and of the Implementation Phase capital expenditures which is calculated in a manner consistent with the Lower Bound cost estimate calculation described in the Phase One Application.

RESPONSE:

BC Hydro references the Expected and Authorized amounts for the SCA Project given the level of project definition. However, the lower bound estimate can be inferred from the accuracy range on future estimated costs. Please refer to BC Hydro's response to BCUC IR 1.2.1.2 for the calculation of a lower bound cost estimate consistent with the Phase One Application.

2.0 B. PROJECT COST

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Exhibit B-1, Section 2.1, pp. 2-1 to 2-2; Section 2.3.1.3, pp. 2-11 to 2-12; BC Hydro Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, Section 2.4.3, p. 2-18
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1.2.1 Please discuss whether BC Hydro would consider it appropriate to establish a lower bound cost estimate of the SCA Project and of the Implementation Phase capital expenditures which is calculated in a manner consistent with the Lower Bound cost estimate calculation described in the Phase One Application.

2.1.1 If no, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.1.2.

2.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.1, pp. 2-1 to 2-2; Section 2.3.1.3, pp. 2-11 to 2-12; BC Hydro Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, Section 2.4.3, p. 2-18
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1.2.1 Please discuss whether BC Hydro would consider it appropriate to establish a lower bound cost estimate of the SCA Project and of the Implementation Phase capital expenditures which is calculated in a manner consistent with the Lower Bound cost estimate calculation described in the Phase One Application.

1.2.1.2 If yes, please provide the calculations for a lower bound cost estimate of the items above which includes a breakdown between capital and operating costs that is similar to Table 2-5 in the Phase One Application.

RESPONSE:

Below is an updated version of Table 2-5 from the Phase One Application providing the requested information. As shown in the table below, the lower bound estimate (row AB) is $66.7 million, which is $6.2 million higher than the lower bound estimate in the Phase One Application.

Revised Table 2-5: Lower Bound Amount ($ million)

Ref	Cost Components	Capital Cost	Operating Costs	Total Cost
X	Mid-Range Cost Estimate (row AF from Table 2-7 in the Verification Report)	61.1	10.2	71.3
Y	Lower Bound adjustment (-10% of rows AB, AC and AD from Table 2-7)	(3.6)	(0.7)	(4.4)
Z	Lower Bound Interest During Construction adjustment	(0.2)		(0.2)
AA	Lower Bound Total adjustment (Y + Z)	(3.8)	(0.7)	(4.6)
AB	Lower Bound Amount (X + AA)	57.3	9.5	66.7

Minor differences are due to rounding.

2.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.1, pp. 2-1 to 2-2; Section 2.3.1.3, pp. 2-11 to 2-12; BC Hydro Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, Section 2.4.3, p. 2-18
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On page 2-18 of the Phase One Application, BC Hydro stated that "[t]he low end of the Project Cost Range is known as the Lower Bound cost estimate. The Lower Bound cost estimate is calculated by discounting the sum of the future direct costs plus the 20 percent contingency by the lower end of the estimating accuracy range (-10 percent) as described in section 2.4.1."

1.2.2 Please elaborate on why BC Hydro considers that the estimating accuracy range of the Expected Cost should continue to be +15 percent / -10 percent given the current stage of the SCA Project.

RESPONSE:

It is BC Hydro's standard practice to develop an estimate with a +15 per cent / -10 per cent accuracy range at the completion of the Definition Phase. As the estimating accuracy range only applies to future estimated cost, and given the actual life-to-date costs make up roughly one-third of the Expected Cost, the accuracy range applies to a smaller portion of the SCA Project's costs than in the Phase One Application. In the Phase One Application, the reserve amount for unknown risks (the portion of the estimate determined based on the

+ 15 per cent accuracy range) was $7.7 million. This amount has been reduced to $6.5 million as shown in row AH in Table 2-7 in the Verification Report.

Please also refer to BC Hydro's response to BCUC IR 1.2.2.1 for further discussion.

2.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.1, pp. 2-1 to 2-2; Section 2.3.1.3, pp. 2-11 to 2-12; BC Hydro Supply Chain Applications Project Application (Phase One Application), Exhibit B-1, Section 2.4.3, p. 2-18
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1.2.2.1 Please discuss whether BC Hydro would consider it appropriate to assign a narrower cost estimating accuracy range to the Expected Cost. Why or why not?

RESPONSE:

BC Hydro does not consider it appropriate to assign a narrower cost estimating accuracy range to the Expected Cost as it applies to future estimated cost. The cost estimating accuracy range is in alignment with BC Hydro's standard practice and is based on the degree of design completed at the end of Definition Phase.

The cost estimating accuracy range of + 15 per cent / - 10 per cent used in the Phase One Application was a narrower range than would normally be assigned due to the additional information available at that time that would not normally be

available, such as the Supply Chain Transformation work and the procurement work undertaken to identify a System Integrator. Please see section 2.4.1 of the Phase One Application for further discussion.

3.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 1.3.4, p. 18; Section 2.2.1, p. 2-4; Table 2-2, p. 2-7
Expected cost to the end of the Definition Phase

On page 1-8 of the Application, BC Hydro states that on September 27, 2018, BC Hydro's Board of Directors authorized the SCA Project to proceed with Implementation Phase activities up to the incremental increased value of $15 million in advance of a BCUC Decision.

On page 2-4 and in Table 2-2 of the Application, BC Hydro states that as of August 31, 2017 the Expected Cost to the end of the Definition Phase for the SCA Project is $25.4 million and the actual recorded cost (including interest during construction) is $24.0 million. BC Hydro estimates that the future project cost through to the end of the Definition Phase is $1.4 million.

1.3.1 Please confirm, or explain otherwise, that the Definition Phase is now complete.

RESPONSE:

The only outstanding Definition Phase activity is the completion of this regulatory review and approval process. Please also refer to section 4.3.2 of the Verification Report.

3.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 1.3.4, p. 18; Section 2.2.1, p. 2-4; Table 2-2, p. 2-7
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1.3.1 Please confirm, or explain otherwise, that the Definition Phase is now complete.

1.3.1.1 If confirmed, please provide an update to Table 2-2 through to the end of the Definition Phase with the actual recorded costs of the SCA Project. Please include explanations for any variances.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.3.1.2.

3.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 1.3.4, p. 18; Section 2.2.1, p. 2-4; Table 2-2, p. 2-7
Expected cost to the end of the Definition Phase

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1.3.1 Please confirm, or explain otherwise, that the Definition Phase is now complete.

1.3.1.2 If not confirmed, please provide BC Hydro's current estimate of the future project costs (capital and operating) for the remaining Definition Phase activities, including the amount out of the $1.4 million which has been spent since the filing of the Application.

RESPONSE:

BC Hydro's current estimate of the remaining future Definition Phase costs is $0.3 million (all capital).

Since the filing of the Application, an estimated $1.1 million of the $1.4 million that was forecast for the remaining Definition Phase activities has been expended through the end of December 2018. The $1.1 million consists of $0.1 million in operating costs and $1 million in capital costs.

Please refer to the table below for a summary of the activities the estimated costs have been expended on.

	Cost category	Capital / Operating Allocation	Amount
A	**Change Management**	**Operating**	**92,000**
B	**Data Conversion**	**Operating**	**11,900**
C	**Expenses**	**Operating**	**10,000**
D	**System Integrator costs**	**Operating**	**(4,700)**
E	**Total Operating**	**Operating**	**109,200**
F	**Facilities**	**Capital**	**31,900**
G	**Project Management**	**Capital**	**293,000**
H	**Regulatory**	**Capital**	**33,400**
I	**Procurement**	**Capital**	**6,900**
J	**Technical**	**Capital**	**73,400**
K	**Solutions team**	**Capital**	**124,000**
L	**System Integrator costs**	**Capital**	**462,500**
M	**Total Capital**	**Capital**	**1,025,100**
	Total		**1,134,300**

The System Integrator costs (row L) reflects work completed prior to the filing of the Verification Report and are included in the $0.8 million contingency draw for increases in the System Integrator's Definition Phase cost as discussed on page 2-5 of the Verification Report. Please also refer to BC Hydro's response to BCUC IR 1.4.4 for a breakdown of the $0.8 million variance.

4.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.2.1.1, p. 2-5; Table 2-2, p. 2-7; Phase One Application, Exhibit B-1, pp. 1-7 and 1-9
Definition Phase draws on contingency

On page 2-5 of the Application, BC Hydro states that at the end of the Definition Phase, the SCA Project drew on contingency of $1.5 million of the forecasted $2.3 million in the Phase One Application. Of the $1.5 million, $0.8 million was to "cover increases in the System Integrator's Definition Phase Costs" and $0.7 million was to cover "additional BC Hydro internal cost due to the additional time required to complete Design Stage activities and transition to the Implementation Phase."

On page 1-7 of the Phase One Application, BC Hydro stated "[w]hile BC Hydro has not executed the Master Services Agreement with the System Integrator, it has received firm pricing from its preferred proponent…."

On page 1-9 of the Phase One Application, BC Hydro stated it:

[o]nce BC Hydro receives an Order accepting the capital costs to the end of the Definition Phase, BC Hydro would execute the Master Services Agreement and the initial statements of work with the System Integrator to undertake the preliminary design and the balance of the Definition Phase activities."

1.4.1 Please explain why the System Integrator's Definition Phase Costs increased given that BC Hydro received firm pricing from its preferred proponent in the Phase One Application.

RESPONSE:

The original firm pricing was for a defined scope of work. The System Integrator's Definition Phase Costs increased due to an increase in the scope of the activities the System Integrator completed in the Definition Phase. These activities included: the benefits assessment work described in Chapter 3 of the Verification Report; additional project management tasks originally planned to be performed by BC Hydro's resources; and work to design additional business processes not included in their original scope of work (and to execute additional design workshops associated with these additional business processes). Please also refer to BC Hydro's response to BCUC IR 1.4.4 for further explanation of these activities.

4.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.2.1.1, p. 2-5; Table 2-2, p. 2-7; Phase One Application, Exhibit B-1, pp. 1-7 and 1-9
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1.4.2 Please provide a breakdown of the $0.8 million used to cover increases in the System Integrator's costs into operating costs and capital costs.

RESPONSE:

All of the $0.8 million used to cover the increase in the System Integrator's costs is capital.

4.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.2.1.1, p. 2-5; Table 2-2, p. 2-7; Phase One Application, Exhibit B-1, pp. 1-7 and 1-9
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1.4.3 Please provide a breakdown of the $0.7 million in additional BC Hydro internal cost into operating costs and capital costs.

RESPONSE:

The $0.7 million in additional BC Hydro internal costs is made up of $0.16 million in operating costs and $0.58 million in capital costs.

4.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.2.1.1, p. 2-5; Table 2-2, p. 2-7; Phase One Application, Exhibit B-1, pp. 1-7 and 1-9
Definition Phase draws on contingency

On page 2-5 of the Application, BC Hydro states that at the end of the Definition Phase, the SCA Project drew on contingency of $1.5 million of the forecasted $2.3 million in the Phase One Application. Of the $1.5 million, $0.8 million was to "cover increases in the System Integrator's Definition Phase Costs" and $0.7 million was to cover "additional BC Hydro internal cost due to the additional time required to complete Design Stage activities and transition to the Implementation Phase."

On page 1-7 of the Phase One Application, BC Hydro stated "[w]hile BC Hydro has not executed the Master Services Agreement with the System Integrator, it has received firm pricing from its preferred proponent…."

On page 1-9 of the Phase One Application, BC Hydro stated it:

[o]nce BC Hydro receives an Order accepting the capital costs to the end of the Definition Phase, BC Hydro would execute the Master Services Agreement and the initial statements of work with the System Integrator to undertake the preliminary design and the balance of the Definition Phase activities."

1.4.4 Please include a detailed explanation of the work completed by the System Integrator and BC Hydro, and why it was needed.

RESPONSE:

The additional System Integrator work totalling $0.8 million falls into three categories:

- **Benefits Analysis Work: A description of the work completed is provided in Chapter 3 of the Application. The work was needed to help BC Hydro be responsive to BCUC Order G-158-17 and provide the Benefits Update Report filed with the Phase Two Verification Report. BC Hydro required extra resources and expertise to complete the Benefits Update Report in time to file the Phase Two Verification Report;**

- **Additional Project Management Tasks: BC Hydro's responsibilities during the Mobilization Stage of the project included providing a technology Project Manager and a Project Administrator to work with the System Integrator to**

develop the project management procedures, to establish the project working environment, and to on-board the project team members. Some of the tasks originally planned to be completed by the BC Hydro resources were instead completed by the System Integrator's Project Manager and Project Coordinator, who worked additional overtime hours in order to do so; and

- **Additional Process Design and Workshop Activities: Work to design additional business processes not included in the System Integrator's original scope of work including: the development of additional process flow designs and documentation and the need to complete additional workshops in support of the additional process design (e.g., preparation activities, workshop time, follow-up sessions and documentation). The additional complexity was primarily the result of three factors:**

  a. **Increased solution complexity required to meet the current business requirements resulted in a greater volume of design and solution sessions including SAP configuration design and custom development design reviews;**

  b. **Depth of SCA Blueprint documentation contained in the RFP did not address subsequent changes to business operations, requirements, and / or technology solutions with which the supply chain applications solution needs to integrate; and**

  c. **Additional Business Processes or Process Variations which multiplied the volume of working sessions, workshops, requirements, and process flows or process flow variations.**

The additional BC Hydro work totalling $0.7 million falls into two categories:

- **BC Hydro resources required to support the additional process design and workshop activities described in the third bullet above; and**

- **Extended completion of Design and Implementation Planning Stage Activities: As discussed in Chapter 6 of the Verification Report, the project team required an additional two months to complete the design deliverables to the required level of quality. While the System Integrator's costs for this additional time are covered within their fixed price contract, BC Hydro incurred additional cost for its internal resources during this period. The work completed during this time included finalization, review, and approval of the design deliverables, as well as finalization of detailed Implementation Phase plans.**

5.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.1, pp. 2-8 to 2-10; Table 2-3, p. 2-9
Direct future SCA Project cost for the Implementation Phase

On page 2-8 of the Application, BC Hydro states:

Similar to the approach used when preparing the cost estimate in the Phase One Application, the Implementation Phase forecast costs have been developed using a bottom up approach based on the fixed-price contract between BC Hydro and the System Integrator; the contract between BC Hydro and the Quality Assurance Advisor; and an estimate for the cost of BC Hydro's resources.

On page 2-9 the Application, BC Hydro states:

The forecast direct cost for the Implementation Phase is $37.9 million ($31.5 million capital cost and $6.4 million operating cost). This is $6.6 million higher than the forecast direct cost of $31.3 million ($27.9 million capital cost and $3.4 million operating cost) for the Implementation Phase included in the Phase One Application. As detailed in Table 2-3 below, the $6.6 million variance is due to an increase in the contract between BC Hydro and the System Integrator and in BC Hydro's internal costs, due to changes in the SCA Project's schedule and a need for additional resources dedicated to the SCA Project.

The following table is shown on page 2-9 of the Application:

Table 2-3 Future Direct Cost Variance Breakdown ($ million)

Variance Explanation	Cost Variance ($ million)
Change in System Integrator Contract	3.4
Change in BC Hydro's Internal Cost	3.2

1.5.1 Please clarify why there is a change in the System Integrator Contract for direct future Implementation Phase costs given that it was a fixed-price contract for the project.

RESPONSE:

As discussed in rows 4 to 14 on page 4-20 of the Phase One Application, the PwC services are divided into five work packages (two of which are now complete - Mobilization Stage and Design and Implementation Planning Stage). At

the time of the Phase One Application, a firm fixed price was provided for the first work package (Mobilization Stage) while the final pricing for the other four work packages were to be confirmed prior to the signing each work package's Statement of Work. While under the agreement, PwC was not allowed to change key elements of their pricing (such as their labour rates), the agreement did allow them to update their pricing based on the more detailed understanding of the solution to be developed and the resulting updated implementation plans.

As discussed from row 22 on page 2-9 to row 6 on page 2-10 of the Verification Report, the current fixed-price agreement with PwC covers all three of the remaining work packages to be completed.

5.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.1, pp. 2-8 to 2-10; Table 2-3, p. 2-9
Direct future SCA Project cost for the Implementation Phase

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The following table is shown on page 2-9 of the Application:

Table 2-3 Future Direct Cost Variance Breakdown ($ million)

Variance Explanation	Cost Variance ($ million)
Change in System Integrator Contract	3.4
Change in BC Hydro's Internal Cost	3.2

1.5.1.1 Please provide a detailed breakdown of the $3.4 million variance including: a description of the change, rationale for the change, and the dollar impact (e.g. operating cost, capital cost) of the change.

RESPONSE:

The $3.4 million variance is comprised of $2.2 million in operating costs and $1.2 million in capital costs.

An additional breakdown of the $3.4 million variance by workstream is provided in the following table.

	Workstream	Capital / Operating	Cost variance ($)
A	Data conversion[1]	Operating	1.1
B	Training material development	Operating	1.1
C	Total Operating Variance	Operating	2.2
D	Data conversion[1]	Capital	(1.1)
E	Technical and development	Capital	1.4
F	Detailed design, configuration and testing	Capital	0.9
G	Project Management	Capital	0.4
H	Reporting	Capital	0.5
I	Security	Capital	(0.2)
J	Training development	Capital	(0.8)
K	Quality assurance	Capital	0.1
L	Total Capital Variance	Capital	1.2
M	Total Variance	-	3.4

[1]The System Integrator's costs for data conversion activities was incorrectly classified as capital in the Phase One Application resulting in the offsetting variances in rows A and D.

The above breakdown indicates areas where the costs have increased as a result of increases in complexity. For example:

- **The positive variance of $1.4 million in row E reflects increased customization work required to meet BC Hydro's business requirements;**
- **The positive variance of $0.9 million in row F reflects additional configuration and testing work;**
- **The $0.5 million positive variance in row H reflects an increase in the expected reporting requirements; and**
- **The net positive variance of $0.3 million in the combination of rows B and J reflect the increase in the work effort to develop training materials for the solution.**

The positive variance of $0.4 million for Project Management (row G) relates primarily to the extension of the Implementation Phase schedule by two and a half months.

5.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.1, pp. 2-8 to 2-10; Table 2-3, p. 2-9
Direct future SCA Project cost for the Implementation Phase

On page 2-8 of the Application, BC Hydro states:

Similar to the approach used when preparing the cost estimate in the Phase One Application, the Implementation Phase forecast costs have been developed using a bottom up approach based on the fixed-price contract between BC Hydro and the System Integrator; the contract between BC Hydro and the Quality Assurance Advisor; and an estimate for the cost of BC Hydro's resources.

On page 2-9 the Application, BC Hydro states:

The forecast direct cost for the Implementation Phase is $37.9 million ($31.5 million capital cost and $6.4 million operating cost). This is $6.6 million higher than the forecast direct cost of $31.3 million ($27.9 million capital cost and $3.4 million operating cost) for the Implementation Phase included in the Phase One Application. As detailed in Table 2-3 below, the $6.6 million variance is due to an increase in the contract between BC Hydro and the System Integrator and in BC Hydro's internal costs, due to changes in the SCA Project's schedule and a need for additional resources dedicated to the SCA Project.

The following table is shown on page 2-9 of the Application:

Table 2-3 Future Direct Cost Variance Breakdown ($ million)

Variance Explanation	Cost Variance ($ million)
Change in System Integrator Contract	3.4
Change in BC Hydro's Internal Cost	3.2

1.5.2 Please provide a detailed breakdown and explanation of the $3.2 million change in BC Hydro's Internal Costs. Please indicate the changes which are operating costs versus capital costs.

RESPONSE:

The $3.2 million variance is comprised of $0.8 million in operating costs and $2.5 million in capital costs.

An additional breakdown of the $3.2 million variance by workstream is provided in the following table.

	Workstream	Capital / Operating	Cost variance ($)
A	**Data conversion**	**Operating**	**-**
B	**Training material development**	**Operating**	**0.2**
C	**Change Management**	**Operating**	**0.5**
D	**Expenses**	**Operating**	**-**
E	**Total Operating Variance**	**Operating**	**0.8**
F	**Data conversion**	**Capital**	**0.2**
G	**Technical and development**	**Capital**	**0.7**
H	**Detailed design, configuration and testing**	**Capital**	**1.1**
I	**Project Management**	**Capital**	**0.4**
J	**Reporting**	**Capital**	**0.1**
K	**Security**	**Capital**	**-**
L	**Training development**	**Capital**	**(0.2)**
M	**Quality assurance**	**Capital**	**(0.1)**
N	**Project Facilities**	**Capital**	**0.1**
O	**Software Licenses**	**Capital**	**0.2**
P	**Total Capital Variance**	**Capital**	**2.5**
Q	**Total Variance**	**-**	**3.2**

The above breakdown indicates the areas where the costs have increased as a result of increases in complexity. For example:

- **The positive variance of $0.7 million in row G reflects increased customization work required to meet BC Hydro's business requirements; and**

- **The positive variance of $1.1 million in row H reflects additional configuration and testing work.**

The positive variances for Change Management (row C), Project Management (row I), and Project Facilities (row N) relate primarily to the extension of the Implementation Phase schedule by two and a half months.

5.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.1, pp. 2-8 to 2-10; Table 2-3, p. 2-9
Direct future SCA Project cost for the Implementation Phase

Further on page 2-9 of the Application, BC Hydro states:

The underlying driver for the increase in the Implementation Phase direct costs is an overall increase in the complexity and understanding of the solution, which has led to an increase in the project schedule and estimated resource levels that will be required to complete it… and the changes to the project schedule, respectively.

1.5.3 Please elaborate on what is meant by the "overall increase in the complexity and understanding of the solution" (e.g. details of the specific aspects of the SCA Project which are more complex or which BC Hydro obtained a greater understanding of during the Design Phase).

RESPONSE:

The Implementation Phase project schedule and cost estimates included in the Phase One Application were developed based on information provided by the Systems Integrator through the Request for Proposal (RFP) process, which were in turn based on the conceptual level information provided to them through the procurement process (such as the Conceptual Design Report and the 153 Supply Chain Business Requirements). The System Integrator combined this information with their experiences implementing SAP at other clients to estimate the amount of configuration and customization that would be required, which in turn drove the estimated project timeline and resource requirements (both their own, and BC Hydro's).

As is the case with technology projects, it was not until the System Integrator interacted directly with the more than 200 BC Hydro business specialists in the Design Stage workshops that they understood the full range of the detailed requirements to be met by the solution. For example, through the design process, the initial 153 Supply Chain Business Requirements have been detailed into roughly 1,000 specific requirements that the solution needs to enable.

Some examples of specific aspects of the solution of which the System Integrator and BC Hydro have obtained a greater understanding and that are more complex, include:

- **Approvals and financial controls was a topic where the requirements were discovered to be more complex than anticipated, requiring an additional seven design sessions to fully understand the requirements and develop a solution. Some examples of complexity within this topic include:**

  - **Business scenario variations in approval workflows due to differing business requirements for projects and work orders; and**

  - **Variations in business requirements such as: capital projects versus recurring capital programs, projects with and without contingency, work managed using Ariba versus using the contractor work management portal, etc.;**

- **Procurement of services was another topic where the high number of use cases in the business resulted in additional complexity in the solution, such as: the use of multiple purchase order types to support different scenarios (e.g., standard purchase orders, flexible purchase orders, unplanned purchase orders, outline agreements, and pricing conditions);**

- **The interactions between BC Hydro's various business groups (e.g., distribution lines, generating stations, transmission lines and stations, vegetation management, capital projects, capital program management) and the supply chain drove numerous specific requirements, and also contributed to the solution complexity. PwC originally estimated that these interactions could be defined with 18 process designs (BC Hydro had provided four general scenarios in the Conceptual Design Report). However, a total of 68 processes were required to capture the various interactions between supply chain and operations / capital project management;**

- **The management of materials procured for use on a specific project (i.e., project stock) was found to be more complex than was originally assumed;**

- **The interactions between SAP ECC, Ariba and supply chain workspace were determined to be more complex than was originally estimated. PwC originally estimated that there would be five interfaces required between the three systems, while 19 discreet interactions were identified through the design process; and**

- **BC Hydro identified more user interface modifications than were originally estimated as a result of gaining a better understanding of the standard SAP solution. The Systems Integrator originally estimated that a limited number of user interface modifications would be required. Through the design process, 26 individual user interface modifications were identified.**

5.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.1, pp. 2-8 to 2-10; Table 2-3, p. 2-9
Direct future SCA Project cost for the Implementation Phase

Further on page 2-9 of the Application, BC Hydro states:

The underlying driver for the increase in the Implementation Phase direct costs is an overall increase in the complexity and understanding of the solution, which has led to an increase in the project schedule and estimated resource levels that will be required to complete it… and the changes to the project schedule, respectively.

1.5.4 Since initiating the Implementation Phase, please identify if there has there been or there is anticipated to be any additional changes with respect to the complexity or understanding of the solution that would impact the cost of the project.

RESPONSE:

Since initiating the Implementation Phase, a number of items have been identified that may increase (or decrease) the solution complexity and could impact cost. While each of the items individually would have a relatively minor impact to cost, a rigorous change control process is followed to ensure that only items that can be accommodated within the project schedule and budget, and meet a business need, are approved for inclusion in the solution. This is a standard control employed on BC Hydro technology projects to manage new requirements and changes that invariably arise during the Implementation Phase. If a change requires a draw on project contingency, Steering Committee approval would be required.

Items identified to date:

1. **Leverage the Accessible Direct Ship (ADS) materials design to provide an enhanced solution for Maintenance, Repair, and Operating (MRO) materials;**

2. **The potential need to mask the use of personnel ID number in standard SAP screens;**

3. **Enhanced capability in selecting orders and operations for printing;**

4. **Enhanced capability to enable processing of service entry sheets for Electric Service Orders;**

5. **Activate SAP's GS01 function to simplify category hierarchy reporting;**

6. **Consolidate status update functions; and**

7. **Include change reason coding at line item level in requisitions (instead of at header level).**

Items 5 and 6 represent potential reductions in the solution complexity.

6.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.2, p. 2-11; Table 2-4, p. 2-11
Interest During Construction (IDC)

On page 2-11 of the Application, BC Hydro states:

IDC on the Implementation Phase cost is currently estimated at $2.3 million with the interest rates in Table 2-4 (column C) applied to the direct cost accumulated in each fiscal year to Fiscal 2022.

BC Hydro provides Table 2-4 as follows:

Table 2-4 IDC Rates from Fiscal 2016 to Fiscal 2022

A	B	C
Fiscal Year	**Phase One Interest Rates (%)**	**Verification Report Interest Rates (%)**
2016	4.1	4.05
2017	4.05	4.05
2018	4.12	4.05
2019	4.23	4
2020	4.41	3.86
2021		3.83
2022		3.61

1.6.1 Please provide an explanation for the changes in interest rates in Table 2-4 for fiscal years 2016, 2018, 2019 and 2020 between the Phase One Application and the current Application.

RESPONSE:

Interest During Construction (IDC) is charged to projects at BC Hydro's weighted average cost of debt (WACD). The Phase One Application rates in Table 2-4 are BC Hydro's forecast weighted average cost of debt for fiscal 2016 to fiscal 2020 at the time of preparing the analysis in Phase One. The Verification Report rates are:

(i) The actual weighted average cost of debt rates for fiscal 2016 to fiscal 2018; and

(ii) The forecast weighted average cost of debt rates for fiscal 2019 to fiscal 2022 at the time of preparing the analysis for the Verification Report.

The change in IDC rates for fiscal 2016 and fiscal 2018 between the Phase One Application and the current Verification Report is a result of the difference between BC Hydro's forecast weighted average cost of debt for fiscal 2016 and fiscal 2018 at the time of preparing the analysis in the Phase One Application, and BC Hydro's actual weighted average cost of debt for those years. There may be changes between forecast and actual weighted average cost of debt as a result of changes between forecast and actual debt volumes and between forecast and actual interest rates.

The change in forecast IDC rates for fiscal 2019 and fiscal 2020 between the Phase One Application and the current Verification Report is a result of the difference between BC Hydro's forecast weighted average cost of debt for fiscal 2019 and fiscal 2020 at the time of preparing the analysis in the Phase One Application, and BC Hydro's forecast weighted average cost of debt for those same fiscal years at the time of preparing the analysis in the current Verification Report. The reduction in forecast weighted average cost of debt is partly due to lower forecast short-term and long-term interest rates (as provided by the Ministry of Finance), as shown in the table below.

Forecast Interest Rates (Ministry of Finance)	F2019 (%)	F2020 (%)
Short Term Interest Rates – Phase One Application WACD	1.98	3.10
Short Term Interest Rates – Current Verification Report WACD	1.72	2.04
Long Term Interest Rates – Phase One Application WACD	4.55	5.55
Long Term Interest Rates – Current Verification Report WACD	3.36	3.76

Additionally, BC Hydro's forecast weighted average cost of debt for fiscal 2019 and fiscal 2020 for the Verification Report includes the impact of debt hedges related to BC Hydro's current debt management strategy, which helps lock in low interest rates. This was not included in BC Hydro's forecast weighted average cost of debt at the time of preparing the analysis in the Phase One Application, since the impact of debt hedges was not finalized at the time of filing the Phase One Application.

6.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.1.2, p. 2-11; Table 2-4, p. 2-11
Interest During Construction (IDC)

On page 2-11 of the Application, BC Hydro states:

IDC on the Implementation Phase cost is currently estimated at $2.3 million with the interest rates in Table 2-4 (column C) applied to the direct cost accumulated in each fiscal year to Fiscal 2022.

BC Hydro provides Table 2-4 as follows:

Table 2-4 IDC Rates from Fiscal 2016 to Fiscal 2022

A	B	C
Fiscal Year	**Phase One Interest Rates (%)**	**Verification Report Interest Rates (%)**
2016	4.1	4.05
2017	4.05	4.05
2018	4.12	4.05
2019	4.23	4
2020	4.41	3.86
2021		3.83
2022		3.61

1.6.1.1 Please quantify the impact that the interest rate changes above had on the estimated $2.3 million interest accumulated over the life of the SCA Project.

RESPONSE:

The impact that the interest rate changes above had on the estimated $2.3 million interest accumulated over the life of the SCA Project is $0.3 million ($2.6 million vs $2.3 million).

7.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2, p. 2-12; Appendix E, p. 8
Authorized Cost

On page 2-12 of the Application, BC Hydro states that the Authorized Cost of the SCA Project is $79.3 million.

On page 8 of the September 2018 Board Briefing Memo and Certified Resolution (Appendix E), Board resolution 4 states "The Capital Projects Committee be and is hereby authorized to approve expenditures in excess of the Expected Cost up to the Authorized Amount."

1.7.1 Please explain the role, responsibility and composition of the Capital Projects Committee.

RESPONSE:

The Capital Projects Committee is one of the standing committees of BC Hydro's Board of Directors and currently includes John C. W. Ritchie (Chair), James P. Hatton and John Nunn. The Capital Projects Committee assists the Board of Directors in fulfilling its obligations and oversight responsibilities related to the delivery of capital projects. Specifically, this includes, but is not limited to, dam safety, the execution of long-term capital plans and budgets, project oversight and relationships with First Nations. For capital projects with a forecast cost greater than $50 million, the Committee reviews the status of capital projects during the Identification or Definition phases, reviews and recommends the preferred alternative for approval by the Board of Directors, following the completion of the Identification Phase, and reviews and recommends financial approval by the Board of Directors, before the start of the Implementation Phase. The Capital Projects Committee meets quarterly in conjunction with the Board of Directors Meeting.

Information on BC Hydro's Board of Directors, including its committees and members, is available online: https://www.bchydro.com/toolbar/about/who_we_are/committees.html.

8.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Table 2-7, p. 2-15; Appendix F, Tab B1
Table 2-7

In Table 2-7 on page 2-15 of the Application, BC Hydro states in row AI that total Incremental Interest During Construction on the project reserves is $1.3 million (column F).

In Table 2-7 in Appendix F, Tab B1 of the Application, BC Hydro states that total Incremental Interest During Construction on the project reserves is $0.2 million (column F).

1.8.1 Please clarify whether Table 2-7 provided on page 2-15 of the Application or Table 2-7 provided in Appendix F, Tab B1 of the Application is correct with respect to row AI. Please provide either a corrected Table 2-7 for page 2-15 of the Application or for Appendix F, Tab B1 of the Application, as appropriate.

RESPONSE:

BC Hydro clarifies Table 2-7 provided in Appendix F, Tab B1 is correct with respect to row AI. The Table 2-7 provided in Appendix F, Tab B1 was copied to the Verification Report incorrectly. BC Hydro filed a corrected Table 2-7 for page 2-13 of the Verification Report under separate cover (Exhibit B-1-2).

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

In addition to the costs described above, the SCA Project is anticipated to incur incremental annual operating and capital costs of between $2.3 million and $3.4 million to provide ongoing business support and sustainment. This amount includes costs not reflected in the Phase One Application, such as ongoing Supply Chain business unit support and sustainment costs, including headcount reduction costs. The Phase One Application had ongoing IT-only support and sustainment costs of between $1.8 million to $2.9 million.

In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

BCUC staff copied the following table from Appendix F, Tab E2:

	Input	Value	Override
A	In-service fiscal year:	F20	
B	In-service quarter:	Q4	
C	Sustainment Team Hand-Off	2020-07-01	
D	Asset life:	10	
E	Benefits until:	2029-11-15	
	F21 Total Resource Cost	$ 109,571	
	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.1 Please explain what is meant by “ongoing Supply Chain Business Unit Support and Sustainment Costs, including headcount reduction costs” (e.g. nature of the costs, including why they are not included in the costs provided in Table 2-7 - Total SCA Project).

RESPONSE:

Ongoing Supply Chain business unit support and sustainment costs are costs related to maintaining and sustaining the Supply Chain applications and business processes after the SCA Project is completed. The Supply Chain sustainment team will provide support for the supply chain applications and will act as liaisons between Supply Chain, business users, and the IT team to manage things like trouble shooting user issues, providing additional training if required, validating and prioritizing enhancement requests, monitoring and enforcing compliance with business processes and overseeing the tracking and reporting of Supply Chain applications benefits.

Headcount reduction costs are costs relating to employee termination where their position has been eliminated as a result of the SCA project and updated business processes. BC Hydro will be required to pay severance to impacted employees where the reductions cannot be managed through attrition or transfer to other vacant positions.

Consistent with Technology Ongoing Costs, ongoing Supply Chain business unit support and sustainment costs and headcount reduction costs are not included in the SCA Project costs provided in Table 2-7 because they are either ongoing annual, or one-time operating costs that will be incurred after the Supply Chain applications solution is placed in service and the project has been completed. Supply Chain business unit support and sustainment costs will be incurred annually, on an ongoing basis. Headcount reduction costs will be incurred one-time only, but will likely not occur until two years after the project has been completed.

As with other ongoing costs, these costs have been incorporated into the net present value of discounted cash flow and revenue requirements presented in the Verification Report.

Please also refer to BC Hydro's response to BCUC IR 1.9.4.

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

In addition to the costs described above, the SCA Project is anticipated to incur incremental annual operating and capital costs of between $2.3 million and $3.4 million to provide ongoing business support and sustainment. This amount includes costs not reflected in the Phase One Application, such as ongoing Supply Chain business unit support and sustainment costs, including headcount reduction costs. The Phase One Application had ongoing IT-only support and sustainment costs of between $1.8 million to $2.9 million.

In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

BCUC staff copied the following table from Appendix F, Tab E2:

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C	Sustainment Team Hand-Off	2020-07-01	
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E	Benefits until:	2029-11-15	
	F21 Total Resource Cost	$ 109,571	
	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.1.1 Please explain how these costs were estimated, and the information used to support these estimates.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.3 for an explanation of how the ongoing Supply Chain business unit support and sustainment costs were estimated.

Please refer to BC Hydro's response to BCUC IR 1.9.4 for an explanation of how the headcount reduction costs were estimated.

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

In addition to the costs described above, the SCA Project is anticipated to incur incremental annual operating and capital costs of between $2.3 million and $3.4 million to provide ongoing business support and sustainment. This amount includes costs not reflected in the Phase One Application, such as ongoing Supply Chain business unit support and sustainment costs, including headcount reduction costs. The Phase One Application had ongoing IT-only support and sustainment costs of between $1.8 million to $2.9 million.

In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

BCUC staff copied the following table from Appendix F, Tab E2:

	Input	Value	Override
A	In-service fiscal year:	F20	
B	In-service quarter:	Q4	
C	Sustainment Team Hand-Off	2020-07-01	
D	Asset life:	10	
E	Benefits until:	2029-11-15	
	F21 Total Resource Cost	$ 109,571	
	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.1.2 Please explain why certain costs “such as ongoing Supply Chain business unit support and sustainment costs” in the $2.3 million to $3.4 million were not included in the Phase One Application.

RESPONSE:

The Phase One Application (page 2-24, lines 2 to 8) identified that the SCA Project would result in incremental annual operating and capital costs of $1.8 million to $2.9 million to provide ongoing IT support and sustainment.

The increase in the range of annual ongoing costs between the Phase One Application ($1.8 million to $2.9 million) and the Verification Report ($2.3 million to $3.4 million) is due to the refinement of the estimated ongoing IT support and sustainment costs, and the addition of ongoing Supply Chain business unit support and sustainment costs including headcount reduction costs.

Appendix F, Tab G1 provides the ongoing costs by fiscal year, with the highest annual cost ($3.4 million) expected to be incurred in fiscal 2022 (Cells K23 plus K28) and the lowest annual cost ($2.3 million) expected to be incurred in fiscal 2025 (Cells N23 plus N28).

Incremental Supply Chain business unit support and sustainment costs were not included in the Phase One Application because BC Hydro had assumed that the existing sustainment team within the Supply Chain business unit would also be able to sustain the Supply Chain applications solution. However, as details of the Supply Chain applications solution became available, BC Hydro recognized that additional resources will be required to sustain the Supply Chain applications and business processes.

Headcount reduction costs were not included in the Phase One Application because BC Hydro had assumed that any headcount reductions arising would be realized through attrition or transfers to vacant positions. While this is still BC Hydro's preferred strategy, we also recognize that it may not be possible in all cases, and therefore some severance costs may be incurred.

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

In addition to the costs described above, the SCA Project is anticipated to incur incremental annual operating and capital costs of between $2.3 million and $3.4 million to provide ongoing business support and sustainment. This amount includes costs not reflected in the Phase One Application, such as ongoing Supply Chain business unit support and sustainment costs, including headcount reduction costs. The Phase One Application had ongoing IT-only support and sustainment costs of between $1.8 million to $2.9 million.

In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

BCUC staff copied the following table from Appendix F, Tab E2:

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	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.2 Please reconcile the incremental annual operating costs and capital costs of between $2.3 million and $3.4 million to the amounts provided in Appendix F (Tab E1 and E2).

RESPONSE:

The amounts provided in the Input areas of Appendix F, Tab E1 (Cells B4 to E23) and Tab E2 (B4 to E13) need to be adjusted for inflation and prorated into fiscal

years based on the SCA Project go-live date in order to calculate the incremental annual operating and capital costs for each fiscal year. This analysis is presented in Tab E1 (Rows 26 to 57) and Tab E2 (Rows 16 to 33) of Appendix F.

The incremental annual operating and capital cost range of $2.3 million to $3.4 million is obtained from Appendix F, Tab G1, which copies the inflation adjusted and prorated amounts from Tabs E1 and E2 and presents them in an annual cash flow format by fiscal year. The highest annual operating and capital costs ($3.4 million) are expected to be incurred in fiscal year 2022 (Tab G1, Cells K23 plus K28) and the lowest annual operating and capital costs ($2.3 million) are expected to be incurred in fiscal year 2025 (Tab G1, Cells N23 plus N28).

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
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In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

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	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.3 Please provide an explanation for how BC Hydro determined the F21, F22 and F23 Onwards Total Resource Costs which are outlined in red in the table above. Please include an explanation for the variability in the expected annual Total Resource Costs between F21 and F23, and why the costs are expected to remain constant from F23 onwards.

RESPONSE:

BC Hydro will use the existing sustainment team within the Supply Chain business unit to sustain the Supply Chain applications and business processes. However, it was recognized that this team is not adequately resourced to sustain the Supply Chain applications solution on its own. BC Hydro estimates that initially three additional full-time equivalent (FTE) positions will be required to help stabilize the new tools and processes and provide comprehensive support to the user base.

During fiscal 2021, the SCA project team will provide stabilization and sustainment support, and gradually transition this function to the Supply Chain business unit sustainment team before the SCA Project is completed. Therefore only a portion of the costs relating to the three additional FTEs (i.e. post SCA Project completion) has been included as ongoing cost for fiscal 2021.

During fiscal 2022, BC Hydro expects that support requirements will remain high while users get better acquainted with the new tools and processes, and therefore the three additional FTEs will still be required.

By fiscal 2023, the system will have been live for over two years, and BC Hydro expects that the software and user base will be fully stabilized, and that support requirements going forward will be lower than during the initial stabilization period. The additional sustainment resources can be reduced from three FTEs to one. The total resource cost for fiscal 2023 onwards represents the cost of one FTE, but as shown in Appendix F (Tab E2, Row 33, and Tab G1, Row 27), this annual cost is adjusted for inflation each year.

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

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In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

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E	Benefits until:	2029-11-15	
	F21 Total Resource Cost	$ 109,571	
	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.4 Please provide an explanation for how BC Hydro determined the Estimated Headcount Reduction Costs which are outlined in green in the table above.

RESPONSE:

BC Hydro estimates that of the 20 full-time equivalents expected to be eliminated as a result of the SCA project, the majority, if not all, will be achieved through attrition, non-renewal of temporary employees, or reduction in usage of contractors.

For modeling purposes, BC Hydro assumed that up to 10 employees may need to be terminated. Based on previous experience with headcount reductions, BC Hydro assumed that eight of these individuals will likely apply for other vacant positions or exercise their collective agreement rights to bid into other positions, thereby forcing the incumbents to apply for other positions. To be conservative, BC Hydro assumed that once this process has completed, severance may be paid to two individuals.

9.0 B. PROJECT COST

Reference: PROJECT COST
Exhibit B-1, Section 2.3.2.2, pp. 2-13 to 2-14; Table 2-7, p. 2-15; Section 2.4, p. 2-17; Appendix F, Tab E1 and E2
Other SCA Project costs

On page 2-17 of the Application, BC Hydro states:

In addition to the costs described above, the SCA Project is anticipated to incur incremental annual operating and capital costs of between $2.3 million and $3.4 million to provide ongoing business support and sustainment. This amount includes costs not reflected in the Phase One Application, such as ongoing Supply Chain business unit support and sustainment costs, including headcount reduction costs. The Phase One Application had ongoing IT-only support and sustainment costs of between $1.8 million to $2.9 million.

In addition, BC Hydro presented in Appendix F, Tab E1 and Tab E2 the Technology Ongoing Costs and Ongoing Business Costs, respectively related to the SCA Project.

BCUC staff copied the following table from Appendix F, Tab E2:

	Input	Value	Override
A	In-service fiscal year:	F20	
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E	Benefits until:	2029-11-15	
	F21 Total Resource Cost	$ 109,571	
	F22 Total Resource Cost	$ 508,589	
	F23 Onwards Total Resource Cost	$ 219,143	
	Estimated Headcount Reduction Costs	$ 195,079	

1.9.5 Please explain why Estimated Headcount Reduction Costs are added to the Non-Inflated Annual Operating Costs (row M) for F22 and for F22 only.

RESPONSE:

Estimated Headcount Reduction Costs are only included for fiscal 2022 because these severance costs are expected to be one-time costs only, and are expected to be incurred approximately two years after go-live. The costs included in fiscal 2022 have been adjusted for inflation.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
Validation and review approach

On page 3-4 and 3-5 of the Application, BC Hydro states the following:

As summarized in the Benefits Report [Appendix G], the following approach was used to complete the review and update the benefits of the SCA Project:

- **Step 1:** Document Review and Analysis - Reviewed existing documentation and validated capability gap assessments against design stage outputs to assess benefits for completeness, reasonableness to measure, and likelihood of realization;
- **Step 2a:** Stakeholder Validation - Conducted interviews with SCA Project stakeholders to confirm assumptions and inputs for forecasted quantitative and qualitative benefits and measurement;
- **Step 2b:** Industry Peer and Benchmark Comparison – Compared forecasted benefits to the measurement of benefits realized by industry peers for key benefits to assess realization timeframe and ratio and identify any changes to the benefits that might be necessary; and
- **Step 3:** Tested benefits with BC Hydro stakeholders to confirm reasonableness of findings and developed a detailed report to summarize confirmed benefits, key performance indicators, assumptions, gaps, risks, and any other additional considerations.

On page 64 of Appendix H of the Application, PricewaterhouseCoopers (PwC) and BC Hydro note that the following stakeholders were consulted:

Stakeholders Consulted

Procurement
- Phillip Li
- Irene Liang
- Sven Rowaert
- Kiernan Dixon
- Leonardo Luna
- Mayukh Debnath
- Haroon Raza
- Randie Levetsovitis
- Allan Chu

Work Management
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Data and Reporting
- Tim Kikkert
- Diego Mendez
- Tania Cernezel
- Mirjana Petrovic

Other
- Tania Dashko
- Joseph Sathianathan
- Michael O'Grady
- Wayne Nichiporik

1.10.1 Please explain what criteria (e.g. department, role, years of experience in role, user frequency with supply chain, etc.) PwC and BC Hydro used to select the stakeholders listed on page 64 of Appendix H of the Application.

RESPONSE:

The stakeholders listed on page 64 of Appendix H of the Verification Report are SCA Project team members from BC Hydro and PwC. These individuals have the most detailed knowledge of the Supply Chain applications design and how it will enable the realization of the targeted benefits.

The BC Hydro individuals listed on page 64 of Appendix H were selected to be part of the SCA Project team specifically because of their operational experience and knowledge of BC Hydro's business processes and capability gaps in their respective functional areas.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
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- Wayne Nichiporik

1.10.1.1 Please confirm, or explain otherwise, that the stakeholders listed on page 64 of Appendix H of the Application were consulted in both Step 2a and Step 3 of the approach used to review/update the SCA Project benefits.

RESPONSE:

Confirmed.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
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- Wayne Nichiporik

1.10.1.2 Please discuss whether there were any stakeholders that BC Hydro intended to consult but was unable to consult.

RESPONSE:

BC Hydro was able to consult all stakeholders that we intended to consult. Where the SCA project team members (listed on page 64 of Appendix H of the Verification Report) needed to confirm certain details or obtain additional subject matter expertise, they were able to reach out to the relevant individuals in the business to obtain the information required.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
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1.10.1.2 Please discuss whether there were any stakeholders that BC Hydro intended to consult but was unable to consult.

1.10.1.2.1 If yes, please discuss the work that was performed to address the missing stakeholders' point of view.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.10.1.2.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
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1.10.2 Please provide details on the criteria used for identifying and selecting industry peers with respect to Step 2b of the approach used to complete the review/update the SCA Project benefits. Please provide the name(s) the industry peers selected.

RESPONSE:

Please find below PwC's response to this information request.

Selection criteria for industry peers began with industry comparables from previous projects where PwC has consulted, such as: Enmax, Sask Power, Wisconsin Power, Epcor, Hydro One, Fortis Alberta, Hydro Ottawa, Hydro Quebec and Pacific Gas & Electric.

In specific areas, such as infrastructure capital projects, PwC utilized companies from large capital intensive industries as well for the comparables.

Criteria used for identifying and selecting industry peers included total spend, categories of spend, comparable operations including distribution, and systems in use.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
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1.10.3 Please discuss, with rationale, which “key benefits” were used for benchmark comparison (i.e. Benefit No. or Benefit ID) in Step 2b of the approach used to complete the review and update of the SCA Project.

RESPONSE:

Please find below PwC’s response to this information request.

All of the identified benefits were reviewed during our benchmark comparison to test the reasonability of realization timeframe and ratios. The effort level expended was significantly higher on the key benefits, which were those identified as having a possible quantifiable value.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
Validation and review approach

On page 3-4 and 3-5 of the Application, BC Hydro states the following:

As summarized in the Benefits Report [Appendix G], the following approach was used to complete the review and update the benefits of the SCA Project:

- **Step 1:** Document Review and Analysis - Reviewed existing documentation and validated capability gap assessments against design stage outputs to assess benefits for completeness, reasonableness to measure, and likelihood of realization;
- **Step 2a:** Stakeholder Validation - Conducted interviews with SCA Project stakeholders to confirm assumptions and inputs for forecasted quantitative and qualitative benefits and measurement;
- **Step 2b:** Industry Peer and Benchmark Comparison – Compared forecasted benefits to the measurement of benefits realized by industry peers for key benefits to assess realization timeframe and ratio and identify any changes to the benefits that might be necessary; and
- **Step 3:** Tested benefits with BC Hydro stakeholders to confirm reasonableness of findings and developed a detailed report to summarize confirmed benefits, key performance indicators, assumptions, gaps, risks, and any other additional considerations.

On page 64 of Appendix H of the Application, PricewaterhouseCoopers (PwC) and BC Hydro note that the following stakeholders were consulted:

Stakeholders Consulted

Procurement
- Phillip Li
- Irene Liang
- Sven Rowaert
- Kiernan Dixon
- Leonardo Luna
- Mayukh Debnath
- Haroon Raza
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- Diego Mendez
- Tania Cernezel
- Mirjana Petrovic

Other
- Tania Dashko
- Joseph Sathianathan
- Michael O'Grady
- Wayne Nichiporik

1.10.3.1 Please provide the key findings from the industry peers and benchmark comparison, and discuss how the findings impacted the benefits and/or expected quantified benefits (if applicable).

RESPONSE:

Please find below PwC's response to this information request.

The key findings from the industry peer group and benchmark comparison was validation on a commensurate level of detail of the analysis and clarification of what benefits can be monetized vs. non-monetized and highlight additional qualitative benefits to consider. The comparison was also used to validate realization timelines, and was used to challenge the assumptions and analysis for further clarification and accuracy.

During the benefit analysis PwC and BC Hydro spent time reviewing the reasonability of realization timeframes and ratios. The basis of these reviews was founded on benchmark comparisons, PwC experience on other system implementation projects, and business logic based on volume, frequency of transaction and other like inputs.

The benefit testing process was applied in three key areas to all benefits which had an expected quantified benefit of greater than zero:

- **Timeframe to Achieve Benefit - Each benefit was assessed to determine a reasonable duration to 'ramp up' to achieving 100 per cent of the expected annual benefit. This was based on benchmarks and PwC's experience;**

- **Realization Ratio - The realization ratio is a factor to offset the impact of any known potential information deficit that may affect the realization of the quantified benefit. The realization ratio was adjusted up or down, based on the level of confidence from the Phase One Application. This resulted in some instances, such as Benefit ID No. 2, where the ratio went from 50 per cent to 70 per cent based on greater availability of data and a bigger sample size to analyze, which increased the level of confidence; and**

- **Expected Quantified Benefit Calculation - Each expected quantified benefit was calculated during Design stage, based on BC Hydro historical volume data with modifications for future demand forecasts as change to future state operations occurs. This was tested against benchmarks and PwC experience.**

An example of how the comparative benchmark data was used that led to a refined realization timeframe was on the calculation and estimation of achieving the inventory turns in Benefit ID No. 14 and reduced inventory in Benefit ID No. 102. Estimations developed by the joint project team had projected a longer realization timeframe. Comparative data based on previous project experience illustrated that other corporations achieved similar benefit in a reduced timeframe. Therefore, after further review and evaluation, the realization timeframe was reduced.

When evaluating benefits against benchmark data no general trend of any form of estimation bias was identified. Several benefits were reduced in duration while others were increased.

As a result of this comprehensive review, the benefits were refined with higher level of confidence within the range of benefits submitted in the Phase One Application (low, mid, and high scenarios) and better estimated into Expected Quantified Benefit and Expected Monetized Benefit for the purpose of validating the business case for the SCA Project.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
Validation and review approach

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As summarized in the Benefits Report [Appendix G], the following approach was used to complete the review and update the benefits of the SCA Project:

- **Step 1:** Document Review and Analysis - Reviewed existing documentation and validated capability gap assessments against design stage outputs to assess benefits for completeness, reasonableness to measure, and likelihood of realization;
- **Step 2a:** Stakeholder Validation - Conducted interviews with SCA Project stakeholders to confirm assumptions and inputs for forecasted quantitative and qualitative benefits and measurement;
- **Step 2b:** Industry Peer and Benchmark Comparison – Compared forecasted benefits to the measurement of benefits realized by industry peers for key benefits to assess realization timeframe and ratio and identify any changes to the benefits that might be necessary; and
- **Step 3:** Tested benefits with BC Hydro stakeholders to confirm reasonableness of findings and developed a detailed report to summarize confirmed benefits, key performance indicators, assumptions, gaps, risks, and any other additional considerations.

On page 64 of Appendix H of the Application, PricewaterhouseCoopers (PwC) and BC Hydro note that the following stakeholders were consulted:

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- Wayne Nichiporik

1.10.4 Please explain the benefits testing process that was applied in Step 3 of the approach used to review/update the SCA Project benefits and clarify whether this testing was completed for all benefits or for a selection of benefits.

RESPONSE:

Please find below PwC's response to this information request.

This benefit testing process step applied the expertise of BC Hydro stakeholders to confirm the reasonableness of the benefit findings. In this step, BC Hydro employees considered each benefit and applied some or all of the following considerations based on the applicability to each individual benefit:

1. **Evaluated existing processes to estimate or measure volumes, frequencies and durations of transactions which could be impacted by the new SCA Design;**

2. **Assessed or examined whether the benefits which had been identified would be considered reasonable and that the application of the system and processes could produce the intended result;**

3. **Considered which key performance indicators would be required to evaluate or manage the performance of the future state process;**

4. **Challenged the assumptions made by the design and benefits team in assessing the potential benefits; and**

5. **Considered the gaps and risks associated with the future state design and how they may impact the achievement of the projected benefit.**

Consideration was given to all identified benefits during this process, however the level of scrutiny and effort was weighted to those benefits which produced the greatest value.

10.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.1, pp. 3-4 to 3-5; Appendix H, p. 64
Validation and review approach

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As summarized in the Benefits Report [Appendix G], the following approach was used to complete the review and update the benefits of the SCA Project:

- **Step 1:** Document Review and Analysis - Reviewed existing documentation and validated capability gap assessments against design stage outputs to assess benefits for completeness, reasonableness to measure, and likelihood of realization;
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- **Step 2b:** Industry Peer and Benchmark Comparison – Compared forecasted benefits to the measurement of benefits realized by industry peers for key benefits to assess realization timeframe and ratio and identify any changes to the benefits that might be necessary; and
- **Step 3:** Tested benefits with BC Hydro stakeholders to confirm reasonableness of findings and developed a detailed report to summarize confirmed benefits, key performance indicators, assumptions, gaps, risks, and any other additional considerations.

On page 64 of Appendix H of the Application, PricewaterhouseCoopers (PwC) and BC Hydro note that the following stakeholders were consulted:

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- Wayne Nichiporik

1.10.4.1 Please provide the key findings from the benefits testing process, and discuss how the findings impacted the benefits and/or expected quantified benefits (if applicable).

RESPONSE:

Please find below PwC's response to this information request.

The key findings from the benefits testing process with BC Hydro stakeholders was a logical validation of the work done by the benefit team. This step was necessary to assure that assumptions made about BC Hydro specific systems, processes, regulations and people would be confirmed by personnel who are experienced in performing the processes on a daily basis and the project team implementing the system.

This review considered a few key areas which had evolved since the Phase One Application:

1. **Transaction volumes, frequencies, and associated costs based on current business conditions;**

2. **Assumptions which were made about process durations, resource time expenditures and personnel interactions; and**

3. Project and process risks which were identified during the design phase of the project.

The impact of these changes affected a significant number of benefit calculations but the magnitude of the effect was generally inconsequential. A few specific benefits had a more significant impact.

11.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.2, Table 3-2, p. 3-7
Changes to identified benefits

On page 3-7 of the Application BC Hydro provides Table 3-2:

Table 3-2 Changes to Identified Benefits

Benefit ID	Benefit Name	Change	Category (Cost/ Effort/ Risk)
92	Reduced spend due to systematic communication of change in the demand	New	Cost
102	Improved visibility of excess project material	New	Cost
103	Improved reel return management	New	Cost
104	Reduction in inventory obsolescence write-offs	New	Cost
60	Reduction of expedited purchasing on non-stock material	Removed	Cost
66	Reduced cost to compile spend reports	Removed	Effort
93	Inventory process effort reduction	New	Effort
94	Reduction of efforts to process manual POs	New	Effort
96	Reduction of effort to process manual change requests	New	Effort
97	Reduced effort for scheduler via improved material visibility	New	Effort
100	Reduced effort with system blocks on closing charge codes with open orders	New	Effort
105	Reduction in project forecasting effort	New	Effort
13	Reduced effort by streamlining demand management on long-lead time items	Removed	Effort
15	Effort reduction through automated inventory level management	Removed	Effort
23	Reduced effort via evaluated receipt settlement (ERS)	Removed	Effort
35	Reduced effort via centralized kitting	Removed	Effort
44	Reduced effort to execute material return from projects	Removed	Effort
56	Eliminate maintenance of duplicate work orders in PassPort	Removed	Effort
98	Reduced risk of receiving and paying for non-compliant material	New	Risk

1.11.1 Please discuss how the changes to the identified benefits listed in Table 3-2 of the Application impacted BC Hydro's assessment that the SCA Project will close the 13 identified capability gaps in

BC Hydro's current supply chain system and processes. If there was no impact, please explain why not.

RESPONSE:

The changes to the identified benefits listed in Table 3-2 of the Verification Report did not impact BC Hydro's assessment that the SCA Project will close the 13 identified capability gaps in BC Hydro's current supply chain system and processes.

As explained in the Phase One Application, the 13 capability gaps were derived from the 153 business requirements outlined in BC Hydro's Supply Chain Business Model. The Supply Chain applications design addresses each of BC Hydro's Supply Chain business requirements, thereby enabling the 13 capability gaps to be closed.

Closure of capability gaps is expected to result in reductions in cost, effort or risk at BC Hydro. However, there is no "minimum benefit threshold" that determines whether or not a capability gap has been closed.

For instance, there are two capability gaps with no associated quantified or non-quantified benefits. As explained below, the SCA Project will close these capability gaps even though there are no quantified or non-quantified benefits:

1. **Capability gap #8 – Inability to pre-assemble materials for field crews (centralized kitting): As indicated in Appendix F, Tab F1, Row 28, while the SCA Project will deliver the technical capability to enable centralized kitting, centralized kitting will not become widespread until the upstream processes such as centralized demand planning, work order management and scheduling become more mature. Although the SCA Project will close the capability gap, realization of benefits is dependent on business processes outside the scope of the project. Therefore no benefit will be quantified as part of the SCA Project; and**

2. **Capability gap #11 – Inability to pay suppliers without an invoice: As indicated in Appendix F, Tab F1, Row 23, the SCA Project will close this gap by delivering Evaluated Receipt Settlement (ERS) functionality as originally planned. The benefit associated with closing this capability gap (Benefit ID No. 23) is now quantified as part of Benefit ID No. 26 (reduced effort to approve invoices).**

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-8 of the Application BC Hydro states:

The following assumptions were also used in the analysis:

- Based on a more refined analysis, BC Hydro has estimated that an average of 65 per cent of cost reduction benefits will be attributable to capital activities, with the remaining average of 35 per cent being attributable to operating and financing activities. In the Phase One Application 76 per cent of cost benefits were attributed to capital activities and 24 per cent to operating activities, based on an analysis of historical spend information. Benefits relating to financing activities were not included in this capital/operating allocation.

  Based on the projected allocation of effort reduction impacts to specific parts of the organization as a result of the Design work done to date, an average of 65 per cent of effort reduction benefits are attributable to capital activities and 35 per cent to operating activities. In the Phase One Application, the allocation of effort reduction benefits was assumed to be 40 per cent capital and 60 per cent operating, based on the portion of BC Hydro's total labour costs incurred for capital versus operating activities;

1.12.1 Please explain which benefits (i.e. Benefit No. or Benefit ID) were affected by the change in the percentage of cost reduction benefits attributable to capital activities and operating activities as described on page 3-8 of the Application. Please explain why the identified benefits were affected and quantify the impact.

RESPONSE:

In the Phase One Application, the main cost benefit driving the 24 per cent operating allocation and 76 per cent capital allocation was Benefit ID No. 5 which remains unchanged. As part of the Definition Phase, Benefit ID No. 14 was increased from $1.2 million to $2.7 million and was verified to have no capital impact. In addition, Benefit ID Nos. 102, 103 and 104 are new benefits identified and each has different allocations between operating and capital activities. These revisions have changed the overall average allocation percentage as described in the preamble above and shown in the table below.

		Verification Report Percent Allocation		Phase One Application Percent Allocation		Quantified Impact	
ID No.	**Verification Report Benefit Quick Name**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**
5	**Reduced cost due to active contract and supplier management**	**3,857**	**12,215**	**3,857**	**12,215**	**0**	**0**
14	**Reduction of cost of capital through an increase in inventory turns**	**2,677**	**0**	**642**	**2,035**	**2,035**	**(2,035)**
102	**Improved excess project material visibility**	**82**	**734**	**196**	**620**	**(114)**	**114**
103	**Improve reel return management**	**0**	**400**	**96**	**304**	**(96)**	**96**
104	**Reduction in inventory obsolescence write-offs**	**425**	**0**	**102**	**323**	**323**	**(323)**
Grand Total		**7,041**	**13,350**	**4,894**	**15,497**	**2,147**	**(2,147)**

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-8 of the Application BC Hydro states:

The following assumptions were also used in the analysis:

- Based on a more refined analysis, BC Hydro has estimated that an average of 65 per cent of cost reduction benefits will be attributable to capital activities, with the remaining average of 35 per cent being attributable to operating and financing activities. In the Phase One Application 76 per cent of cost benefits were attributed to capital activities and 24 per cent to operating activities, based on an analysis of historical spend information. Benefits relating to financing activities were not included in this capital/operating allocation.

  Based on the projected allocation of effort reduction impacts to specific parts of the organization as a result of the Design work done to date, an average of 65 per cent of effort reduction benefits are attributable to capital activities and 35 per cent to operating activities. In the Phase One Application, the allocation of effort reduction benefits was assumed to be 40 per cent capital and 60 per cent operating, based on the portion of BC Hydro's total labour costs incurred for capital versus operating activities;

1.12.2 Please explain which benefits (i.e. Benefit No. or Benefit ID) were affected by the change in the percentage of effort reduction benefits attributable to capital activities and operating activities as described on page 3-8 of the Application. Please explain why the identified benefits were affected and quantify the impact.

RESPONSE:

All effort benefits (listed in the table below showing the quantified impact) were affected by the change in the percentage allocation to capital and operating activities. As stated in BC Hydro's response to BCUC IR 1.13.1, BC Hydro has estimated the reduction of 20 full-time equivalent positions in specific areas of the business. The change in allocation of the capital and operating benefits are directly attributable to activities performed in the impacted business groups.

		Verification Report Percent Allocation		Phase One Application Percent Allocation		Quantified Impact	
ID No.	**Verification Report Benefit Quick Name**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**
2	**Streamline the purchasing process via PO automation**	**34**	**50**	**50**	**34**	**(17)**	**17**
3	**Reduction in efforts through self-service for service requisitions**	**22**	**34**	**34**	**22**	**(11)**	**11**
7	**Reduction of effort in operations managing the completion of work**	**250**	**374**	**374**	**250**	**(125)**	**125**
10	**Reduced effort for contract renewal with more accessible information**	**13**	**20**	**20**	**13**	**(7)**	**7**
16	**Eliminate manual material reservations in Materials Management**	**43**	**390**	**260**	**173**	**(217)**	**217**
19	**Reduced effort required for invoice issue resolution**	**5**	**8**	**8**	**5**	**(3)**	**3**
26	**Reduced effort to approve invoices**	**276**	**413**	**413**	**276**	**(138)**	**138**
29	**Reduction of efforts in manually performing accruals**	**116**	**175**	**175**	**116**	**(58)**	**58**
45	**Reduced efforts by elimination of secondary CR/CO approval**	**2**	**2**	**2**	**2**	**(1)**	**1**
58	**Reduced effort by eliminating manual material requirement tracking**	**3**	**4**	**4**	**3**	**(1)**	**1**
67	**Reduced efforts to develop scope of work**	**37**	**56**	**56**	**37**	**(19)**	**19**

		Verification Report Percent Allocation		Phase One Application Percent Allocation		Quantified Impact	
ID No.	**Verification Report Benefit Quick Name**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**	**Operating ($'000)**	**Capital ($'000)**
	via service catalogue						
79	**Effort reduction in contract closure with residual value**	**2**	**2**	**2**	**2**	**(1)**	**1**
81	**Effort reduction by elimination of duplicate sourcing events**	**0**	**1**	**1**	**0**	**(0)**	**0**
94	**Reduction of efforts to process manual POs**	**25**	**38**	**38**	**25**	**(13)**	**13**
96	**Reduction of effort to process manual change requests**	**2**	**4**	**4**	**2**	**(1)**	**1**
100	**Reduced effort with system blocks on closing charge codes with open Orders**	**16**	**25**	**25**	**16**	**(8)**	**8**
105	**Reduction in project forecasting effort**	**70**	**105**	**105**	**70**	**(35)**	**35**
Grand Total		**917**	**1,700**	**1,570**	**1,047**	**(653)**	**653**

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

In Table 3-3 on page 3-10 of the Application, BC Hydro summarizes the changes in the benefits by the capability gap addressed between the mid-scenario benefits in the Phase One Application and the Expected Benefits forecast in this Application.

On page 3-13 of the Application, BC Hydro states that a refinement of the approach in the Application compared to the Phase One Application "is the distinction between Expected Benefits and the expected monetized benefits (Monetized Benefits)" of the SCA Project.

1.12.3 Please provide a table similar to Table 3-3 on page 3-10 of the Application, which summarizes the changes in the benefits by the capability gap addressed between the mid-scenario benefits in the Phase One Application and the Monetized Benefits forecast in this Application.

RESPONSE:

Please find below a revised Table 3-3, which summarizes the changes in the Monetized Benefits by capability gap and provides an explanation of significant variances.

Capability Gap	Phase One Mid Scenario Benefits (A)	Verification Report Monetized Benefits (B)	Variance (B - A)
1 - Inability to manage service related spend	12.04	1.70	-10.34
2 - Poor contract management	5.98	16.11	10.13
3 - Limited ability to manage inventory levels	6.04	3.51	-2.53
4 - Poor management of individual supplier performance	0.20	0.00	-0.20
5 - Limited ability to manage supply chain for capital projects	0.00	0.18	0.18
6 - Lack of order, delivery and payment tracking	0.10	0.01	-0.09
7 - Inability to support return of unused materials	0.07	0.82	0.75
8 - Inability to pre-assemble materials for field crews	0.39	0.00	-0.39
9 - Lack of mobile access to inventory information	0.00	0.00	0.00
10 - No self-serve option for routine service requests	0.62	0.21	-0.41
11 - Inability to pay suppliers without an invoice	0.06	0.00	-0.06
12 - Inability to streamline controls and approvals process	0.02	0.05	0.03
13 - Inability to integrate with work management systems	0.68	0.43	-0.24
Total	26.17	23.01	-3.16

- **1 - Inability to manage service related spend - down $10.3 million: Decrease is mainly attributable to lower monetized benefits for Benefit ID No. 7, No. 26, No. 29, and No. 67. In the Design Phase it was determined that the monetizable nature of these effort benefits is lower than was assumed in Phase One. This is due to effort savings occurring as small increments amongst many individuals across the organization. While not all effort benefits can be monetized, there is value to BC Hydro as time is freed up to focus on higher value activities;**
- **2 - Poor contract management - up $10.1 million: Increase is the result of a change in the underlying approach to Benefit ID No. 5 where a 1.5 per cent reduction in overall spend is now estimated to be achievable which is up from 0.5 per cent in Phase One; and**
- **3 - Limited ability to manage inventory levels - down $2.5 million: Decrease is mainly due to elimination of Benefit ID No. 60 partially offset by the additions of new benefits (Benefit ID No. 103 and No. 104) and an increase in the expected savings for Benefit ID No. 14.**

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

In Table 3-3 on page 3-10 of the Application, BC Hydro summarizes the changes in the benefits by the capability gap addressed between the mid-scenario benefits in the Phase One Application and the Expected Benefits forecast in this Application.

On page 3-13 of the Application, BC Hydro states that a refinement of the approach in the Application compared to the Phase One Application "is the distinction between Expected Benefits and the expected monetized benefits (Monetized Benefits)" of the SCA Project.

1.12.3.1 Please provide an explanation for any significant annual variances.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.12.3.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-11 of the Application, BC Hydro states the following:

The Expected Benefits for capability gap No. 2 increased by $10.3 million annually. This increase is as a result of a change in the underlying approach to Benefit ID No. 5 – "Reduced Cost Due to Active Contract & Supplier Management." Benefit ID No. 5 quantifies BC Hydro's increased ability to better manage contracts and suppliers to ensure anticipated contract benefits are fully realized, do not erode, and are increased over time. In the Phase One Application, BC Hydro had forecasted the value of this benefit as a reduction of 0.5 per cent of overall spend based on its improved ability to negotiate commercial terms with better data and visibility to demand. PwC advised taking a broader focus to quantify the benefits from active contract and supplier management not only to negotiate better terms, but also to mitigate value leakage. The benchmarked range for savings from the elimination of cost leakage from contract non-compliance was determined to be between 0.5 per cent and 3 per cent in a PwC study. BC Hydro and PwC determined that a reduction of 1.5 per cent, which is just below the mid-point, is achievable and reasonable.

1.12.4 Please explain how BC Hydro and PwC determined that a reduction of 1.5 percent for savings from the elimination of cost leakage from contract non-compliance is "achievable and reasonable."

RESPONSE:

BC Hydro and PwC have jointly prepared the following response to this IR.

PwC's report 'A Holistic Approach to Third-Party Contracts' included as Attachment 1 to CEC IR 1.23.1, indicates that cost leakage from contract non-compliance can generate between 0.5 per cent and 3 per cent in contract specific savings. For the reasons discussed below, BC Hydro and PwC concluded that a reduction of 1.5 per cent is achievable and reasonable:

- **When reviewing the contributing factors typically associated with contract leakage we determined that the potential for leakage or non-compliance is**

higher with organizations with a higher service-to-goods procurement ratio. BC Hydro procurement ratio typically exceeds 70 per cent services procurement to 30 per cent goods procurement. This ratio by nature is managed with highly manual processes creating an increased risk of leakage;

- **BC Hydro also procures a very wide variety of products and services from a significant number of vendors, across a variety of business verticals with a high variation in complexity of transaction. Managing the procurement of this wide variety of products and services creates an increased risk of leakage;**

- **BC Hydro is at a lower level of technological maturity with respect to supply chain technologies than the average company that may be reflected in PwC's report. BC Hydro is implementing SAP ECC with some Ariba functionality. This is a logical progression in Supply Chain technology from current state. However, on average, most comparable companies implemented systems at this level of complexity 5 to 15 years ago. The limitations of supply chain technology currently employed by BC Hydro are an impediment to developing further maturity;**

- **Following from the above, BC Hydro is more dependent on manual processes than the average company that may be reflected in a report of this nature. A lower level of technological maturity requires a dependency on manual processes to minimize contract leakage versus a reliance on data, reporting and automation; and**

- **The report was tested against other available market intelligence and PwC's experience at industry peers which were determined to align with recommendations provided in this report.**

Given the above factors, we have determined that 1.5 per cent (50 per cent of the full potential of this benefit) is a reasonable and achievable target.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-11 of the Application, BC Hydro states the following:

The Expected Benefits for capability gap No. 2 increased by $10.3 million annually. This increase is as a result of a change in the underlying approach to Benefit ID No. 5 – "Reduced Cost Due to Active Contract & Supplier Management." Benefit ID No. 5 quantifies BC Hydro's increased ability to better manage contracts and suppliers to ensure anticipated contract benefits are fully realized, do not erode, and are increased over time. In the Phase One Application, BC Hydro had forecasted the value of this benefit as a reduction of 0.5 per cent of overall spend based on its improved ability to negotiate commercial terms with better data and visibility to demand. PwC advised taking a broader focus to quantify the benefits from active contract and supplier management not only to negotiate better terms, but also to mitigate value leakage. The benchmarked range for savings from the elimination of cost leakage from contract non-compliance was determined to be between 0.5 per cent and 3 per cent in a PwC study. BC Hydro and PwC determined that a reduction of 1.5 per cent, which is just below the mid-point, is achievable and reasonable.

1.12.5 Please provide the details of the companies that make up the "benchmarked range" in the referenced PwC study and discuss how these companies have comparable business practices to BC Hydro.

RESPONSE:

Please find below PwC's response to this information request.

PwC cannot provide the details of the companies as it would breach client confidentiality. Many of the organizations were comparable in terms of size, scale and technological maturity (or advanced in technological maturity). Beyond this study, PwC's recent experience working with utility and other organizations on similar projects indicates implementing SAP ECC has resulted in savings through active supplier management, contract management and contract value leakage that were in the range of 1.5 per cent to 3 per cent, which confirms that the 1.5 per cent mark is reasonable and achievable.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
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1.12.6 Please explain whether the reduction of 1.5 percent for savings from the elimination of cost leakage from contract non-compliance is equally applied to complex and non-complex contracts.

RESPONSE:

Please find below PwC's response to this information request.

The 1.5 per cent for savings is a conservative savings rate being applied to all contracts with repetitive spend that are actively managed. While the actual savings percentage will vary from contract to contract, the overall average of 1.5 per cent is considered realistic and achievable.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
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1.12.6 Please explain whether the reduction of 1.5 percent for savings from the elimination of cost leakage from contract non-compliance is equally applied to complex and non-complex contracts.

1.12.6.1 If yes, please explain why equal application is considered reasonable.

RESPONSE:

Please find below PwC's response to this information request.

Application of an average cost benefit percentage across all addressable spend is a common practice within the industry as observed by PwC on benefits calculations and is regarded as a reasonable method for organizations with such a wide variety of product and service categories to arrive at an overall estimated benefit. The complexity of individual contracts associated with the spend is not in itself a key determinant of the potential for contract leakage and therefore the potential benefit associated with reducing it.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-11 of the Application, BC Hydro states the following:

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1.12.6 Please explain whether the reduction of 1.5 percent for savings from the elimination of cost leakage from contract non-compliance is equally applied to complex and non-complex contracts.

1.12.6.2 If no, please explain how the 1.5 percent is applied to complex and non-complex contracts.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.12.6.1.

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

On page 3-11 of the Application, BC Hydro states the following:

The Expected Benefits for capability gap No. 2 increased by $10.3 million annually. This increase is as a result of a change in the underlying approach to Benefit ID No. 5 – "Reduced Cost Due to Active Contract & Supplier Management." Benefit ID No. 5 quantifies BC Hydro's increased ability to better manage contracts and suppliers to ensure anticipated contract benefits are fully realized, do not erode, and are increased over time. In the Phase One Application, BC Hydro had forecasted the value of this benefit as a reduction of 0.5 per cent of overall spend based on its improved ability to negotiate commercial terms with better data and visibility to demand. PwC advised taking a broader focus to quantify the benefits from active contract and supplier management not only to negotiate better terms, but also to mitigate value leakage. The benchmarked range for savings from the elimination of cost leakage from contract non-compliance was determined to be between 0.5 per cent and 3 per cent in a PwC study. BC Hydro and PwC determined that a reduction of 1.5 per cent, which is just below the mid-point, is achievable and reasonable.

1.12.7 Please provide revised NPV of discounted cash flows and revenue requirements of the SCA Project based on the value of Benefit ID No. 5 as a reduction of 0.5 percent of overall spend (i.e. same as the Phase One Application).

RESPONSE:

BC Hydro maintains that the correct overall value of Benefit ID No. 5 should be based on a reduction of 1.5 per cent of addressable spend as shown in the Verification Report. Please also refer to BC Hydro's response to BCUC IR 1.12.4, which discusses why a reduction of 1.5 per cent is achievable and reasonable, and that the full potential of this benefit is a reduction of 3 per cent.

BC Hydro is providing a revised NPV of discounted cash flows and revenue requirements as Revised Table 3-6 and Revised Table 3-7 below, for the 0.5 per cent scenario as requested, as well as for the 3.0 per cent scenario.

Revised Table 3-6:

Scenarios	NPV of Discounted Cash Flows ($ million)	
	0.5 per cent scenario	3.0 per cent scenario
Expected Costs / Monetized Benefits	(5.8)	113.2
Authorized Costs / Monetized Benefits	(15.7)	103.3
Expected Costs / Expected Benefits	54.9	173.8
Authorized Costs / Expected Benefits	45.0	163.9

Revised Table 3-7:

Scenarios	NPV of Revenue Requirement ($ million) (Increase) / Decrease in Revenue Requirements	
	0.5 per cent scenario	3.0 per cent scenario
Expected Costs / Monetized Benefits	(14.7)	93.6
Authorized Costs / Monetized Benefits	(24.0)	84.4

Revised Table 3-7 reflects the corrections noted in BC Hydro's response to BCUC IR 1.16.5 and the corrected Appendix F filed under separate cover (Exhibit B-1-2)

12.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.3, pp. 3-8 and 3-10; Section 3.2.4, p. 3-13; Table 3-3, p. 3-10; Appendix F, Tab F1
Expected quantified benefits (Expected Benefits)

In Tab F1 of Appendix F of the Application, with respect to Benefit ID 80 "Reduced efforts for AP via less work being performed with no PO," BC Hydro states in Column G that there was no calculation of the Quantified Benefit for this benefit in the Phase One Application because "[s]tatistics on how many multi touch items are due to missing PO are not available at this time."

1.12.8 Please provide an update on BC Hydro's ability to calculate a Quantified Benefit and Monetized Benefit of Benefit ID 80 at this time and provide the benefit amounts, if available.

RESPONSE:

The accounts payable function was repatriated from Accenture Business Services for Utilities into BC Hydro's operations in May 2018. Since this function is back in-house, the nature of this benefit has changed from cost to effort.

There was insufficient data available in order to quantify this effort benefit in time for the filing of the Verification Report. Additionally, any efficiencies in this area will be looked at as part of the overall integration within BC Hydro and therefore will be outside the scope of the SCA Project.

13.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.4, p. 3-14; Appendix F, Tab F1 Monetized Benefits

On page 3-14 of the Application, BC Hydro states that it has "estimated the number of reductions in full time equivalent (FTEs) positions that could be made without introducing new risks and negatively impacting the business" as part of its approach to estimating how much of the Expected Benefits can be monetized.

1.13.1 Please provide the number of estimated FTE positions that can be reduced and a breakdown of the FTEs (e.g. by position and department).

RESPONSE:

This response includes commercially sensitive information which has been redacted in the public version of the response as public disclosure could impact the commercial interests of BC Hydro.

BC Hydro has estimated that 20 full-time equivalent (FTE) positions will be reduced. At this stage of the project, BC Hydro has identified areas of the business where the reductions will occur. These areas are the parts of BC Hydro that have a concentrated number of FTEs performing functions that will have a high reduction in time resulting from a combination of identified benefits. The estimated number of positions by business area is:

The specific positions impacted will be identified later in the Implementation Phase of the SCA Project when additional process details and plans are developed for how the work will be reorganized.

13.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.4, p. 3-14; Appendix F, Tab F1 Monetized Benefits

On page 3-14 of the Application, BC Hydro states that it has "discounted each discrete effort benefit value at the same rate to arrive at a monetized value at the benefit level." [emphasis added]

Further, BC Hydro states "[o]verall, BC Hydro estimates it can monetize approximately 18 per cent of the realizable value of the effort reduction Expected Benefits." [emphasis added]

In Appendix F, Tab F1 – Benefits List, BC Hydro provides the Phase 2 Monetized Benefits in Column U.

1.13.2 Please explain how BC Hydro determined the rate used to discount each discrete effort benefit to arrive at its monetized value and provide the discount rate used.

RESPONSE:

The total Monetized Benefits relating to effort savings is $2.6 million, representing a targeted reduction of 20 full time equivalent (FTE) positions, which BC Hydro has estimated can be made without introducing new risks and negatively impacting the business.

The adjustment made in step (iii) was necessary because most effort benefits are not individually linked to a specific FTE reduction. Rather, it is the cumulative impact of all effort benefits combined, and the resulting restructuring of processes and work methods in the more heavily impacted areas that will enable reduction of FTEs. As a result, other than for Benefit ID No.16, it is not possible to specifically identify the headcount reduction attributable to individual effort benefits in isolation.

BC Hydro could have shown the difference between Total Expected Benefits and Total Monetized Benefits as a one-line summary adjustment, but instead opted to try to allocate the monetized portion to each benefit line item on a pro-rata basis. The methodology used is summarized in the table below.

Effort Benefits ($000)				
	Expected Benefits	**Monetized Benefits**	**Comments**	**Reference to Verification Report**
Total effort benefits	**14,375**	**2,617**		**Appendix F, Tab F2 - Benefits Summary, Cells E12 & F12**
Less: Benefit ID No. 16	**(433)**	**(433)**	**100% of Benefit ID No. 16 is monetized**	**Appendix F, Tab F1 - Benefits List, Cells T18 & U18**
Remaining effort benefits	**13,942**	**2,184**	**Not individually linked to a headcount reduction**	
Monetized Benefits as a percent of Expected Benefits		**15.7%**	**Ratio used to estimate monetized portion of each effort Expected Benefit (other than Benefit ID No. 16)**	

13.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.4, p. 3-14; Appendix F, Tab F1 Monetized Benefits

On page 3-14 of the Application, BC Hydro states that it has "discounted each discrete effort benefit value at the same rate to arrive at a monetized value at the benefit level." [emphasis added]

Further, BC Hydro states "[o]verall, BC Hydro estimates it can monetize approximately 18 per cent of the realizable value of the effort reduction Expected Benefits." [emphasis added]

In Appendix F, Tab F1 – Benefits List, BC Hydro provides the Phase 2 Monetized Benefits in Column U.

1.13.3 Please clarify the meaning of the statement "[o]verall, BC Hydro estimates it can monetize approximately 18 per cent of the realizable value of the effort reduction Expected Benefits" given that the each discrete effort benefit was discounted at the same rate.

RESPONSE:

The statement "[o]verall, BC Hydro estimates it can monetize approximately 18 per cent of the realizable value of the effort reduction Expected Benefits" is based on the ratio of total effort related Monetized Benefits ($2.6 million) divided by total effort related Expected Benefits ($14.4 million). This includes Benefit ID No. 16, which was monetized at 100 per cent.

As illustrated in the response to BCUC IR 1.13.2, excluding Benefit ID No. 16, which was monetized at 100 per cent, all other effort benefits were monetized at 15.7 per cent.

13.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.2.4, p. 3-14; Appendix F, Tab F1 Monetized Benefits

On page 3-14 of the Application, BC Hydro states that it has "discounted each discrete effort benefit value at the same rate to arrive at a monetized value at the benefit level." [emphasis added]

Further, BC Hydro states "[o]verall, BC Hydro estimates it can monetize approximately 18 per cent of the realizable value of the effort reduction Expected Benefits." [emphasis added]

In Appendix F, Tab F1 – Benefits List, BC Hydro provides the Phase 2 Monetized Benefits in Column U.

13.3.1 If certain benefits were discounted using a different rate from that which is provided in response to IR 13.2 above, please identify the benefits and, for each identified benefit: a) provide a step-by-step explanation of the methodology used to calculate the "Phase 2 Monetized Benefit" in Column U of Tab F1 and b) explain why the methodology is appropriate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.13.2.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 3-17 of the Application, BC Hydro states that there are two primary documented outputs of a pilot program initiated by BC Hydro's Technology group in the fall of 2017 to address a gap in its information technology (IT) benefits realization process– an outcome model and a benefits tracking sheet, where "the outcome model is a roadmap of all initiatives, contributions, outcomes, assumptions and risks associated with the IT-enabled business change."

Further, BC Hydro states "[a]s the IT benefits realization program is still in the pilot phase and the SCA Project is substantially underway, the [SCA] Project is currently utilizing only the benefits tracking sheet to track and measure progress towards achieving the forecasted benefits."

1.14.1 Please clarify whether the benefits tracking sheets are being used during the Implementation Phase of the SCA Project.

RESPONSE:

The benefits tracking sheets included in Appendix I of the Verification Report will continue to be used during the Implementation Phase of the SCA Project and the information contained therein will continue to be refined.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
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Further, BC Hydro states "[a]s the IT benefits realization program is still in the pilot phase and the SCA Project is substantially underway, the [SCA] Project is currently utilizing only the benefits tracking sheet to track and measure progress towards achieving the forecasted benefits."

1.14.2 Please discuss when the "outcome model" is expected to be applied to the SCA Project, if at all.

RESPONSE:

The outcome model is intended to be used at the start of a project. As the outcome model did not exist at the beginning of the SCA Project and is still in the pilot phase, and the SCA Project is now in the Implementation Phase, the outcome model will not be used. The financial model filed as Appendix F and the benefit tracking sheets filed as Appendix I will provide the required information.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 3-18 of the Application, BC Hydro states that it will prepare a tracking sheet "for every effort reduction benefit with an annual Expected Benefit above $500,000 at stabilization, and for every cost reduction benefit. At this materiality limit, BC Hydro will be tracking the twelve benefits that comprise approximately 96 per cent of the total Expected Benefits and 99 percent of the total Monetized Benefits."

1.14.3 Please clarify whether BC Hydro will prepare a benefit tracking sheet for: i) every cost reduction benefit (i.e. no materiality limit); or ii) every cost reduction benefit with an annual Expected Benefit above $500,000 at stabilization.

RESPONSE:

BC Hydro will prepare a benefit tracking sheet for all cost reduction benefits.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 3-18 of the Application, BC Hydro states that it will prepare a tracking sheet "for every effort reduction benefit with an annual Expected Benefit above $500,000 at stabilization, and for every cost reduction benefit. At this materiality limit, BC Hydro will be tracking the twelve benefits that comprise approximately 96 per cent of the total Expected Benefits and 99 percent of the total Monetized Benefits."

1.14.4 Please explain how BC Hydro determined a threshold of $500,000 of annual Expected Benefit is appropriate for the tracking sheets.

RESPONSE:

BC Hydro determined that the time and effort of tracking effort benefits under $500,000 outweighed the value received from tracking these benefits. As noted in the preamble, BC Hydro will be tracking 96 per cent the total Expected Benefits and 99 per cent of the total Monetized Benefits.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
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On page 3-18 of the Application, BC Hydro states that it will prepare a tracking sheet "for every effort reduction benefit with an annual Expected Benefit above $500,000 at stabilization, and for every cost reduction benefit. At this materiality limit, BC Hydro will be tracking the twelve benefits that comprise approximately 96 per cent of the total Expected Benefits and 99 percent of the total Monetized Benefits."

1.14.5 Please discuss how long (i.e. length of time) BC Hydro intends to track and measure its progress towards achieving the forecasted benefits of the SCA Project using the benefits tracking sheets and why this length of time is appropriate.

RESPONSE:

BC Hydro intends to track and measure its progress towards achieving the forecasted benefits until they are fully realized which will be three to five years depending on the benefit. Once fully realized, BC Hydro will evaluate whether there is reason to continue to track and monitor the benefits, as at that time the benefits will already be embedded in the business operations.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 6 of Appendix G of the Application, PwC states that there are twelve primary benefits from which the majority of the benefits are expected to be realized:

Benefit number	*Benefit name*	*Benefit category*	*Expected quantified benefit (000's)*	*Monetized benefit (000's)*	*Quantified benefit value compared to Phase 1 estimate*
5	Spend reduction through active contract and supplier management	Cost	$16,073	$16,073	+
7	Reduction of effort in operations managing completion of work	Effort	$3,988	$624	+
14	Reduced carrying costs for material via improved inventory turns	Cost	$2,711	$2,711	+
29	Reduction of efforts in manually performing accruals	Effort	$1,858	$292	+
105	Reduction in Project Forecasting Effort	Effort	$1,121	$175	New
102	Improved excess project material visibility	Cost	$816	$816	New
67	Request Standard Services via catalogue	Effort	$596	$93	-
2	Streamline the purchasing process via PO automation	Effort	$537	$84	+
16	Eliminate Manual Material Reservations at Materials Management	Effort	$433	$433	+
104	Reduction in inventory obsolescence	Cost	$425	$425	New
103	Improve reel return management	Cost	$400	$400	New
3	Increased Purchase Requisition Self-Service	Effort	$358	$56	+

On page 1 of Appendix I-1 of the Application, BC Hydro lists the twelve benefits that it will track as follows:

1.14.6 Please explain why BC Hydro does not propose to monitor Benefit No./ID 3 "Increased Purchase Requisition Self-Service" given that it is one of the twelve primary benefits included on page 6 of Appendix G of the Application.

RESPONSE:

As described on page 3-18 of the Verification Report, BC Hydro will prepare a benefit tracking sheet for each effort benefit greater than $500,000. Benefit ID No. 3 is below the $500,000 threshold.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 6 of Appendix G of the Application, PwC states that there are twelve primary benefits from which the majority of the benefits are expected to be realized:

Benefit number	*Benefit name*	*Benefit category*	*Expected quantified benefit (000's)*	*Monetized benefit (000's)*	*Quantified benefit value compared to Phase 1 estimate*
5	Spend reduction through active contract and supplier management	Cost	$16,073	$16,073	+
7	Reduction of effort in operations managing completion of work	Effort	$3,988	$624	+
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29	Reduction of efforts in manually performing accruals	Effort	$1,858	$292	+
105	Reduction in Project Forecasting Effort	Effort	$1,121	$175	New
102	Improved excess project material visibility	Cost	$816	$816	New
67	Request Standard Services via catalogue	Effort	$596	$93	-
2	Streamline the purchasing process via PO automation	Effort	$537	$84	+
16	Eliminate Manual Material Reservations at Materials Management	Effort	$433	$433	+
104	Reduction in inventory obsolescence	Cost	$425	$425	New
103	Improve reel return management	Cost	$400	$400	New
3	Increased Purchase Requisition Self-Service	Effort	$358	$56	+

On page 1 of Appendix I-1 of the Application, BC Hydro lists the twelve benefits that it will track as follows:

1.14.7 Please explain why BC Hydro proposes to monitor Benefit No./ID 26 "Reduced Effort to Approve Invoices" given that it is not one of the twelve primary benefits included on page 6 of Appendix G of the Application.

RESPONSE:

As noted in BC Hydro's response to BCUC IR 1.14.6, Benefit ID No. 26 is above the $500,000 threshold and therefore will have a benefit tracking sheet prepared and monitored. The omission of Benefit ID No. 26 from PwC's list of primary benefits was an oversight.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 6 of Appendix G of the Application, PwC states that there are twelve primary benefits from which the majority of the benefits are expected to be realized:

Benefit number	*Benefit name*	*Benefit category*	*Expected quantified benefit (000's)*	*Monetized benefit (000's)*	*Quantified benefit value compared to Phase 1 estimate*
5	Spend reduction through active contract and supplier management	Cost	$16,073	$16,073	+
7	Reduction of effort in operations managing completion of work	Effort	$3,988	$624	+
14	Reduced carrying costs for material via improved inventory turns	Cost	$2,711	$2,711	+
29	Reduction of efforts in manually performing accruals	Effort	$1,858	$292	+
105	Reduction in Project Forecasting Effort	Effort	$1,121	$175	New
102	Improved excess project material visibility	Cost	$816	$816	New
67	Request Standard Services via catalogue	Effort	$596	$93	-
2	Streamline the purchasing process via PO automation	Effort	$537	$84	+
16	Eliminate Manual Material Reservations at Materials Management	Effort	$433	$433	+
104	Reduction in inventory obsolescence	Cost	$425	$425	New
103	Improve reel return management	Cost	$400	$400	New
3	Increased Purchase Requisition Self-Service	Effort	$358	$56	+

On page 1 of Appendix I-1 of the Application, BC Hydro lists the twelve benefits that it will track as follows:

1.14.8 Please provide the estimated annual cost of monitoring the SCA Project benefits and confirm whether or not these costs are included in the "Other SCA Project Costs" described in Section 2.4 of the Application.

RESPONSE:

The annual cost of monitoring the benefits has not been estimated at this time. The expectation is the monitoring of the individual benefits will be performed by existing internal positions in the business which will not be an incremental resource cost to BC Hydro and has not been included in the SCA Project's costs. The overall monitoring and consolidation of the SCA Project benefits will be performed centrally by the incremental positions identified and included in the Other SCA Project Costs described in Section 2.4 of the Verification report.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

In the SAP Inquiry, in Attachment 17 BC Hydro provided "Management and Accounting Policies and Procedures (MAPP) 4.1.1B.2 Project Completion and Evaluation Report Requirements" (MAPP 4.1.1B.2), which sets out BC Hydro's requirements for the completion of a Project Completion and Evaluation Report (PCER) that complies with BC Hydro's policies and project management best practices. The purpose of a PCER is stated to be two-fold:

- to **show completion**, summarizing how the project was conducted from a project management perspective in terms of scope, cost & schedule, and
- to **evaluate** the impacts and realized benefits.[1]

On page 7 of MAPP 4.1.1B.2, BC Hydro states that the "next scheduled review of this procedure shall occur in May 2013."

1.14.9 Please discuss whether the policies and procedures outlined in MAPP 4.1.1B.2 remain current and are applicable to the SCA Project.

RESPONSE:

The policies and procedures outlined in MAPP 4.1.1B.2 remain current and are applicable to the SCA Project.

[1] BC Hydro SAP Inquiry, Exhibit B-3, Attachment 17, p. 1.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

In the SAP Inquiry, in Attachment 17 BC Hydro provided "Management and Accounting Policies and Procedures (MAPP) 4.1.1B.2 Project Completion and Evaluation Report Requirements" (MAPP 4.1.1B.2), which sets out BC Hydro's requirements for the completion of a Project Completion and Evaluation Report (PCER) that complies with BC Hydro's policies and project management best practices. The purpose of a PCER is stated to be two-fold:

- to **show completion**, summarizing how the project was conducted from a project management perspective in terms of scope, cost & schedule, and
- to **evaluate** the impacts and realized benefits.[1]

On page 7 of MAPP 4.1.1B.2, BC Hydro states that the "next scheduled review of this procedure shall occur in May 2013."

1.14.9 Please discuss whether the policies and procedures outlined in MAPP 4.1.1B.2 remain current and are applicable to the SCA Project.

1.14.9.1 If not confirmed, please provide the policies and procedures regarding a PCER that are to be applied to the SCA Project (i.e. an updated MAPP 4.1.B.2 or other MAPP).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.9.

[1] BC Hydro SAP Inquiry, Exhibit B-3, Attachment 17, p. 1.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 4 of MAPP 4.1.1B.2, BC Hydro provides the Project Evaluation criteria:

Impacts & Benefits Realization

Note: This section only required if the project's authorized amount exceeds the FAAP approval level of the CFO for projects without Board approval, or if specified by the Project Sponsor and Finance Lead in the Business Case. The Impacts & Benefits Realization Evaluation is to be completed by the Project Manager and team and is subject to review by the Review Team. A project that requires approval by the BC Hydro Board of Directors can only have its Impacts & Benefits Evaluation section of the PCER requirement waived by the Board of Directors.

The Impacts and Benefits Realization table, as populated in the Business Case must be transferred to the PCER. A sample table (Project Impacts and Benefits Analysis table) is included at the back of the PCER template. Note on the table whether the impacts/benefit was achieved, any variances, and comments & status update and evaluation date, as applicable.

1.14.10 Please confirm, or explain otherwise, that the above criteria for Project Evaluation apply to the SCA Project.

RESPONSE:

The above criteria for Project Evaluation apply to the SCA Project.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 4 of MAPP 4.1.1B.2, BC Hydro provides the Project Evaluation criteria:

Impacts & Benefits Realization

Note: This section only required if the project's authorized amount exceeds the FAAP approval level of the CFO for projects without Board approval, or if specified by the Project Sponsor and Finance Lead in the Business Case. The Impacts & Benefits Realization Evaluation is to be completed by the Project Manager and team and is subject to review by the Review Team. A project that requires approval by the BC Hydro Board of Directors can only have its Impacts & Benefits Evaluation section of the PCER requirement waived by the Board of Directors.

The Impacts and Benefits Realization table, as populated in the Business Case must be transferred to the PCER. A sample table (Project Impacts and Benefits Analysis table) is included at the back of the PCER template. Note on the table whether the impacts/benefit was achieved, any variances, and comments & status update and evaluation date, as applicable.

1.14.10 Please confirm, or explain otherwise, that the above criteria for Project Evaluation apply to the SCA Project.

1.14.10.1 If not confirmed, please explain why not and provide the Project Evaluation criteria that will apply to the SCA Project.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.10.

14.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 2.4, p. 2-17; Section 3.3, pp. 3-17 to 3-18; Appendix G, p. 6; Appendix I-1, pp. 1-29; BC Hydro Inquiry of Expenditures related to the adoption of the SAP Platform (SAP Inquiry), Exhibit B-3, Attachment 17, p. 1
Benefits tracking process

On page 4 of MAPP 4.1.1B.2, BC Hydro provides the Project Evaluation criteria:

Impacts & Benefits Realization

Note: This section only required if the project's authorized amount exceeds the FAAP approval level of the CFO for projects without Board approval, or if specified by the Project Sponsor and Finance Lead in the Business Case. The Impacts & Benefits Realization Evaluation is to be completed by the Project Manager and team and is subject to review by the Review Team. A project that requires approval by the BC Hydro Board of Directors can only have its Impacts & Benefits Evaluation section of the PCER requirement waived by the Board of Directors.

The Impacts and Benefits Realization table, as populated in the Business Case must be transferred to the PCER. A sample table (Project Impacts and Benefits Analysis table) is included at the back of the PCER template. Note on the table whether the impacts/benefit was achieved, any variances, and comments & status update and evaluation date, as applicable.

1.14.11 Please confirm, or explain otherwise, that BC Hydro's proposed Benefits Tracking Process, as outlined in Section 3.3 of the Application, is in accordance with the applicable MAPP provided in response to IR 14.9

RESPONSE:

Confirmed. BC Hydro's proposed Benefits Tracking Process is in accordance with the completion of the Project Completion and Evaluation Report (PCER) requirements. The benefit tracking sheets will capture all required information which will then be summarized in the Project Impacts and Benefits Analysis table in the PCER.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit B-1, p. 2-30
NPV of discounted cash flow

On page 3-20 of the Application, BC Hydro states the following:

For this analysis, BC Hydro has run four cost and benefits scenarios:
- Base Case – Expected Cost / Monetized Benefits Scenario;
- Authorized Cost / Monetized Benefits Scenario;
- Expected Cost / Expected Benefits Scenario; and
- Authorized Cost / Expected Benefits Scenario.

The NPV of discounted cash flows is positive in all scenarios.

On page 2-30 of the Phase One Application BC Hydro states the following:

BC Hydro ran three cost and benefits scenarios using the information described in sections 2.4 and 2.5:
- Scenario 1 – Upper Bound cost estimate - Low Benefits;
- Scenario 2 – Mid-Range cost estimate - Mid-Range Benefits; and
- Scenario 3 – Lower Bound cost estimate – High Benefits.

1.15.1 Please provide the estimating accuracy range of the Expected Benefits and Monetized Benefits.

RESPONSE:

There is no estimating accuracy range for the Expected Benefits and Monetized Benefits. Rather, the quantified amounts represent what BC Hydro expects to realize for each benefit (i.e., what BC Hydro considers to be the most likely amount).

In the Phase One Application, BC Hydro presented low, mid and high benefits scenarios by applying a default benefit realization rate of 30, 50 and 60 per cent respectively across all quantified potential benefits. While these benefit realization rate scenarios are useful for sensitivity analysis purposes, they are not intended to indicate estimating accuracy.

For the Verification Report, since BC Hydro had more granular information for each benefit, BC Hydro applied a specific benefit realization rate to individual benefits. These realization rates are detailed in Appendix F, Tab F1, column O, and in Appendix H of the Verification Report. As stated on page 3-8, lines 5 to 8, the individual benefit realization ratios range from 50 per cent to 100 per cent, and the effective weighted realization ratio across all benefits is 54 per cent. For this reason, BC Hydro did not present low, mid and high benefits scenarios in the Verification Report.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit
B-1, p. 2-30
NPV of discounted cash flow

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- Base Case – Expected Cost / Monetized Benefits Scenario;
- Authorized Cost / Monetized Benefits Scenario;
- Expected Cost / Expected Benefits Scenario; and
- Authorized Cost / Expected Benefits Scenario.

The NPV of discounted cash flows is positive in all scenarios.

On page 2-30 of the Phase One Application BC Hydro states the following:

BC Hydro ran three cost and benefits scenarios using the information described in sections 2.4 and 2.5:
- Scenario 1 – Upper Bound cost estimate - Low Benefits;
- Scenario 2 – Mid-Range cost estimate - Mid-Range Benefits; and
- Scenario 3 – Lower Bound cost estimate – High Benefits.

1.15.2 Please discuss why BC Hydro considers the Expected Costs / Monetized Benefits scenario to be the base case. If possible, please provide the likelihood that this scenario will be achieved.

RESPONSE:

BC Hydro considers the Expected Costs / Monetized Benefits scenario to be the base case as it represents the most likely cost scenario, and the more conservative of the two benefits scenarios in the context of an NPV analysis.

For costs, as explained in BC Hydro's response to CEC IR 1.2.2, the SCA Project's Expected Cost is analogous to a P50 cost estimate. P50 is defined as the cost estimate that will not be exceeded 50 per cent of the time.

For benefits, the Monetized Benefits are a subset of Expected Benefits. While the Expected Benefits represent value to BC Hydro, for the purposes of NPV analysis, BC Hydro used Monetized Benefits in the base case scenario, as this provides a more conservative NPV.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit
B-1, p. 2-30
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- Base Case – Expected Cost / Monetized Benefits Scenario;
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- Expected Cost / Expected Benefits Scenario; and
- Authorized Cost / Expected Benefits Scenario.

The NPV of discounted cash flows is positive in all scenarios.

On page 2-30 of the Phase One Application BC Hydro states the following:

BC Hydro ran three cost and benefits scenarios using the information described in sections 2.4 and 2.5:
- Scenario 1 – Upper Bound cost estimate - Low Benefits;
- Scenario 2 – Mid-Range cost estimate - Mid-Range Benefits; and
- Scenario 3 – Lower Bound cost estimate – High Benefits.

1.15.3 Please explain why the 'Upper Bound cost estimate – Low Benefits' scenario included in the Phase One Application was removed from the current Application.

RESPONSE:

The "Upper Bound cost estimate - Low Benefits" scenario was not replicated in the Verification Report because there are no longer low, mid and high benefits scenarios. Please refer to BC Hydro's response to BCUC IR 1.15.1 for a discussion of why these scenarios were not recreated for the Verification Report.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit B-1, p. 2-30
NPV of discounted cash flow

On page 3-20 of the Application, BC Hydro states the following:

For this analysis, BC Hydro has run four cost and benefits scenarios:
- Base Case – Expected Cost / Monetized Benefits Scenario;
- Authorized Cost / Monetized Benefits Scenario;
- Expected Cost / Expected Benefits Scenario; and
- Authorized Cost / Expected Benefits Scenario.

The NPV of discounted cash flows is positive in all scenarios.

On page 2-30 of the Phase One Application BC Hydro states the following:

BC Hydro ran three cost and benefits scenarios using the information described in sections 2.4 and 2.5:
- Scenario 1 – Upper Bound cost estimate - Low Benefits;
- Scenario 2 – Mid-Range cost estimate - Mid-Range Benefits; and
- Scenario 3 – Lower Bound cost estimate – High Benefits.

1.15.3.1 Please provide the NPV of the discounted cash flows for the 'Upper Bound cost estimate - Low Benefits' scenario.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.15.3.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit B-1, p. 2-30
NPV of discounted cash flow

On page 3-20 of the Application, BC Hydro states the following:

For this analysis, BC Hydro has run four cost and benefits scenarios:
- Base Case – Expected Cost / Monetized Benefits Scenario;
- Authorized Cost / Monetized Benefits Scenario;
- Expected Cost / Expected Benefits Scenario; and
- Authorized Cost / Expected Benefits Scenario.

The NPV of discounted cash flows is positive in all scenarios.

On page 2-30 of the Phase One Application BC Hydro states the following:

BC Hydro ran three cost and benefits scenarios using the information described in sections 2.4 and 2.5:
- Scenario 1 – Upper Bound cost estimate - Low Benefits;
- Scenario 2 – Mid-Range cost estimate - Mid-Range Benefits; and
- Scenario 3 – Lower Bound cost estimate – High Benefits.

1.15.3.2 Please provide the benefit percentage required to break even for this scenario.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.15.3.

15.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.1, p. 3-20; Table 3-6, p. 3-21; Phase One Application, Exhibit B-1, p. 2-30
NPV of discounted cash flow

On page 3-21 of the Application, BC Hydro provides Table 3-6 and states:

BC Hydro has also performed a breakeven analysis based on the above scenarios showing the percentage of the Expected Benefits or Monetized Benefits, as appropriate, needed to achieve to break even. Even in a breakeven scenario, the SCA Project would still be value-adding due to the number of non-monetized benefits and reduction in risk expected to be realized.

Table 3-6 NPV of Discounted Cash Flows: Sensitivity and Breakeven Analysis

Scenarios	NPV of Discounted Cash Flows ($ million)	Benefit Percentage Required to Breakeven (%)
Expected Costs / Monetized Benefits	41.8	60
Authorized Costs / Monetized Benefits	31.9	69
Expected Costs / Expected Benefits	102.5	38
Authorized Costs / Expected Benefits	92.6	44

1.15.4 For clarity, please explain how to interpret the Benefit Percentage Required to Breakeven percentages shown in Table 3-6.

RESPONSE:

For the Expected Costs / Monetized Benefits scenario, BC Hydro is required to achieve 60 per cent of the already discounted benefits in order for the NPV to breakeven (sum to zero). As the weighted average benefits realization rate is 54 per cent, 60 per cent of the 54 per cent is required to breakeven.

Put another way, a benefit realization rate of 32 per cent (60 per cent * 54 per cent) across all benefits is required to breakeven for that scenario.

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

On page 3-23 of the Application, BC Hydro provides Table 3-7 and states:

For the NPV of revenue requirements, the following additional assumptions were made:

- All project-related benefits will result in capital and operating budget reductions to be passed on to ratepayers through an incremental reduction in revenue requirements;
- SCA Project monetized benefits impacting capital will result in both lower capital expenditures and lower capital additions in the same year; and
- The amortization period of the monetized benefits impacting capital is 30 years as BC Hydro has assumed an average life of 30 years for assets procured using the new supply chain.

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement ($ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

1.16.1 Please explain the following with respect to the additional assumptions noted in the preamble above: i) how they differ from assumptions in the Phase One Application, ii) why these assumptions were not included in the Phase One Application, and iii) the basis for including these assumptions in the NPV of revenue requirements analysis at this time.

RESPONSE:

The three assumptions in the preamble above are 'additional' to the assumptions used in the discounted cash flow analysis, but are not new assumptions. They were used in the revenue requirement analysis in both the Phase One Application and the Verification Report.

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
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- The amortization period of the monetized benefits impacting capital is 30 years as BC Hydro has assumed an average life of 30 years for assets procured using the new supply chain.

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement ($ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

1.16.2 Please quantify the impact that the additional assumptions had on the NPV of the revenue requirement.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.16.1.

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

On page 3-23 of the Application, BC Hydro provides Table 3-7 and states:

For the NPV of revenue requirements, the following additional assumptions were made:

- All project-related benefits will result in capital and operating budget reductions to be passed on to ratepayers through an incremental reduction in revenue requirements;
- SCA Project monetized benefits impacting capital will result in both lower capital expenditures and lower capital additions in the same year; and
- The amortization period of the monetized benefits impacting capital is 30 years as BC Hydro has assumed an average life of 30 years for assets procured using the new supply chain.

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement ($ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

1.16.2.1 Please provide the information in Table 3-7 using only the assumptions in the Phase One Application.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.16.1. The assumptions in the preamble are the same assumptions used in the Phase One Application.

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

On page 3-23 of the Application, BC Hydro provides Table 3-7 and states:

For the NPV of revenue requirements, the following additional assumptions were made:

- All project-related benefits will result in capital and operating budget reductions to be passed on to ratepayers through an incremental reduction in revenue requirements;
- SCA Project monetized benefits impacting capital will result in both lower capital expenditures and lower capital additions in the same year; and
- The amortization period of the monetized benefits impacting capital is 30 years as BC Hydro has assumed an average life of 30 years for assets procured using the new supply chain.

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement ($ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

1.16.3 Please explain what is meant by “All project-related benefits” in the preamble above (e.g. does this include all cost, effort and risk benefits?)

RESPONSE:

‘All project-related benefits’ in the preamble refer only to those benefits included in the revenue requirements analysis, which are the Monetized Benefits

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

On page 3-23 of the Application, BC Hydro provides Table 3-7 and states:

For the NPV of revenue requirements, the following additional assumptions were made:

- All project-related benefits will result in capital and operating budget reductions to be passed on to ratepayers through an incremental reduction in revenue requirements;
- SCA Project monetized benefits impacting capital will result in both lower capital expenditures and lower capital additions in the same year; and
- The amortization period of the monetized benefits impacting capital is 30 years as BC Hydro has assumed an average life of 30 years for assets procured using the new supply chain.

Table 3-7 NPV of Revenue Requirements: Sensitivity and Breakeven Analysis

Scenarios	NPV of Revenue Requirement ($ million) (i.e., reduction to revenue requirements over time)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	25.1	67
Authorized Cost / Monetized Benefits	19.4	75

1.16.4 For clarity, please explain how to interpret the Benefit Percentage Required to Breakeven percentages shown in Table 3-7.

RESPONSE:

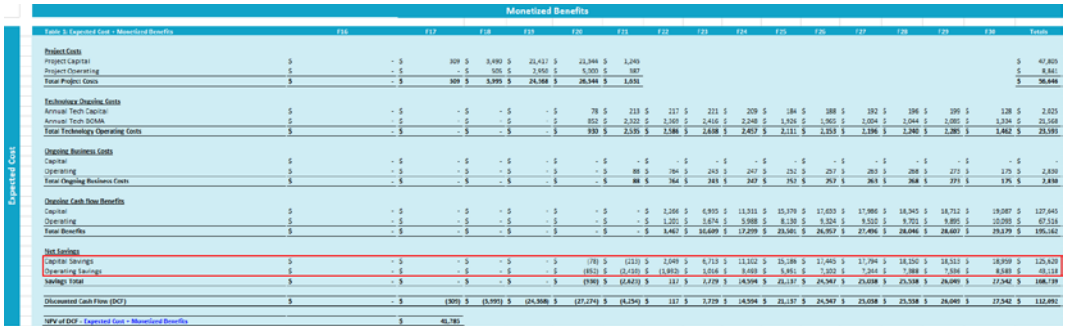
The Benefit Percentage Required to Breakeven is the minimum percentage of Monetized Benefits (which are already discounted by a realization ratio) that need to be realized to result in a net reduction of revenue requirements for the ratepayer on an NPV basis.

Using the percentage amount in Table 3-7 as an example, if 67 per cent or more of the Monetized Benefits materialize in the Expected Cost / Monetized Benefits scenario, then the ratepayer would realize a net benefit (i.e., a decrease in revenue requirements) on an NPV basis.

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

In Appendix F, Tab G1 (NPV DCF) of the Application, BC Hydro calculates Table 1: Expected Cost + Monetized Benefits, as follows:



Monetized Benefits

Expected Cost

Table 1: Expected Cost + Monetized Benefits	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30	Totals
Project Costs																
Project Capital	$ -	$ -	$ 309	$ 3,490	$ 21,417	$ 21,344	$ 1,249									$ 47,809
Project Operating	$ -	$ -	$ -	$ 505	$ 2,950	$ 5,000	$ 387									$ 8,841
Total Project Costs	$ -	$ -	$ 309	$ 3,995	$ 24,368	$ 26,344	$ 1,636									$ 56,648
Technology Ongoing Costs																
Annual Tech Capital	$ -	$ -	$ -	$ -	$ -	$ 78	$ 213	$ 217	$ 221	$ 209	$ 184	$ 188	$ 192	$ 196	$ 199	$ 128	$ 2,025
Annual Tech OOMA	$ -	$ -	$ -	$ -	$ -	$ 852	$ 2,322	$ 2,369	$ 2,416	$ 2,248	$ 1,926	$ 1,965	$ 2,004	$ 2,044	$ 2,085	$ 1,334	$ 21,568
Total Technology Operating Costs	$ -	$ -	$ -	$ -	$ -	$ 930	$ 2,535	$ 2,586	$ 2,638	$ 2,457	$ 2,111	$ 2,153	$ 2,196	$ 2,240	$ 2,285	$ 1,462	$ 23,593
Ongoing Business Costs																
Capital	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating	$ -	$ -	$ -	$ -	$ -	$ 88	$ 784	$ 243	$ 247	$ 252	$ 257	$ 263	$ 268	$ 273	$ 175	$ 2,830
Total Ongoing Business Costs	$ -	$ -	$ -	$ -	$ -	$ 88	$ 784	$ 243	$ 247	$ 252	$ 257	$ 263	$ 268	$ 273	$ 175	$ 2,830
Ongoing Cash flow Benefits																
Capital	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,266	$ 6,955	$ 11,311	$ 15,379	$ 17,693	$ 17,986	$ 18,345	$ 18,712	$ 19,087	$ 127,645
Operating	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,201	$ 3,674	$ 5,988	$ 8,130	$ 9,324	$ 9,510	$ 9,701	$ 9,895	$ 10,093	$ 67,516
Total Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,467	$ 10,609	$ 17,299	$ 23,501	$ 26,957	$ 27,496	$ 28,046	$ 28,607	$ 29,179	$ 195,162
Net Savings																
Capital Savings	$ -	$ -	$ -	$ -	$ -	$ (78)	$ (213)	$ 2,049	$ 6,713	$ 11,102	$ 15,186	$ 17,445	$ 17,794	$ 18,150	$ 18,513	$ 18,959	$ 125,620
Operating Savings	$ -	$ -	$ -	$ -	$ -	$ (852)	$ (2,410)	$ (1,993)	$ 1,016	$ 3,468	$ 5,951	$ 7,102	$ 7,244	$ 7,388	$ 7,536	$ 8,581	$ 42,132
Savings Total	$ -	$ -	$ -	$ -	$ -	$ (930)	$ (2,623)	$ 117	$ 7,729	$ 14,594	$ 21,137	$ 24,547	$ 25,038	$ 25,538	$ 26,049	$ 27,542	$ 168,739
Discounted Cash Flow (DCF)	$ -	$ -	$ (309)	$ (3,995)	$ (24,368)	$ (27,274)	$ (4,254)	$ 117	$ 7,729	$ 14,594	$ 21,137	$ 24,547	$ 25,038	$ 25,538	$ 26,049	$ 27,542	$ 112,692
NPV of DCF - Expected Cost + Monetized Benefits		$ 41,785														

In Appendix F, Tab G2 – (RR Analysis Inputs), BC Hydro calculates Table 1: SCA Expected Cost + Monetized Benefits as follows:

SCA Expected Cost

Table 1: SCA Expected Cost + Monetized Benefits

Fiscal Year	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30	Totals
Project Capital	$ 2,650	$ 7,981	$ 3,490	$ 21,417	$ 21,344	$ 1,245										$ 58,127
Project Operating	$ 1,351	$ 0	$ 505	$ 2,950	$ 5,000	$ 387										$ 10,193
Project IDC	$ 47	$ 120	$ 187	$ 927	$ 1,699	$ -										$ 2,979
Capital Addition (10 year life)					$ 61,107											$ 61,107
Ongoing Capital Savings			$ -	$ -	$ (98)	$ (266)	$ 1,995	$ 6,658	$ 11,028	$ 15,083	$ 17,339	$ 17,686	$ 18,040	$ 18,401	$ 18,887	$ 124,753
Ongoing Operating Savings			$ -	$ -	$ (918)	$ (2,588)	$ (2,114)	$ 830	$ 3,087	$ 5,171	$ 6,306	$ 6,432	$ 6,560	$ 6,692	$ 8,043	$ 37,501

1.16.5 Please explain why the net capital and operating savings highlighted in red in Table 1 of Appendix F, Tab G1 do not agree to the net ongoing capital and operating savings highlighted in green in Table 1 of Appendix F, Tab G2 of Appendix F given that they are for the same scenario (i.e. Expected Cost + Monetized Benefits scenario).

RESPONSE:

In Appendix F, a formula error resulted in the information from Table 2 in Tab G1 being linked to Table 1 in Tab G2. The correct link should have been from Table 1 in Tab G1 to Table 1 in Tab G2 as they both represent the same Expected Cost / Monetized Benefits scenario. As shown in the revised Table 3-7 below, this error resulted in a lower Revenue Requirements NPV for this scenario than would be expected.

BC Hydro files as Attachment 1 to this response an updated Appendix F for the revised Table 1 in Tab G2.

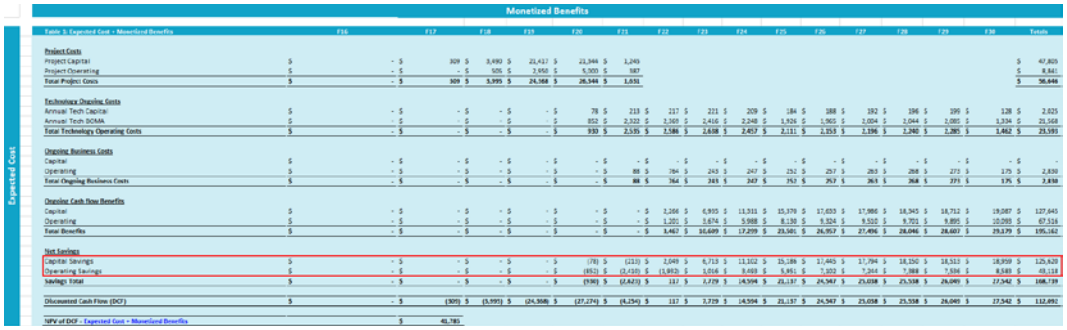
Table 3-7A from Tab B2 in the updated Appendix F:

Scenarios	Revised		Verification Report	
	NPV of Revenue Requirement ($ million)	Benefit Percentage Required to Breakeven (%)	NPV of Revenue Requirement ($ million)	Benefit Percentage Required to Breakeven (%)
Expected Cost / Monetized Benefits	28.6	64	25.1	67
Authorized Cost / Monetized Benefits	19.4	75	19.4	75

16.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Section 3.4.2, Table 3-7, p. 3-23; Appendix F, Tab G1 and G2
NPV of revenue requirement

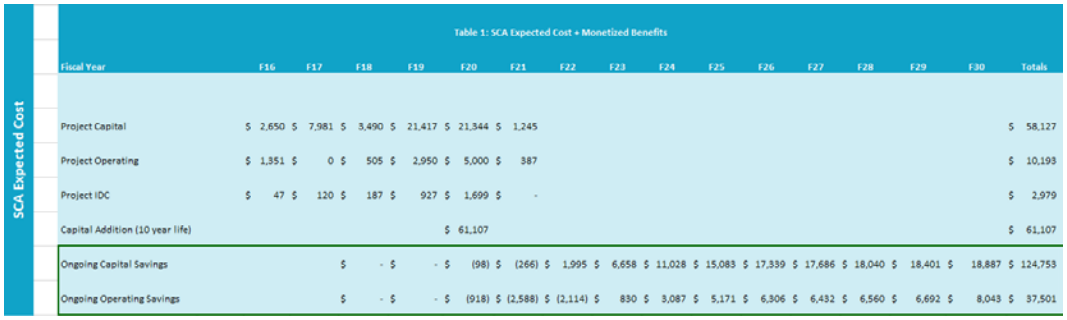
In Appendix F, Tab G1 (NPV DCF) of the Application, BC Hydro calculates Table 1: Expected Cost + Monetized Benefits, as follows:



Monetized Benefits

Table 3: Expected Cost + Monetized Benefits	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30	Totals
Project Costs																
Project Capital	$	- $	309 $	3,490 $	21,417 $	21,344 $	1,249									$ 47,809
Project Operating	$	- $	- $	505 $	2,950 $	5,000 $	387									$ 8,841
Total Project Costs	$	- $	309 $	3,995 $	24,368 $	26,344 $	1,636									$ 56,646
Technology Ongoing Costs																
Annual Tech Capital	$	- $	- $	- $	- $	78 $	213 $	217 $	221 $	209 $	184 $	188 $	192 $	196 $	199 $	128 $ 2,025
Annual Tech DOMA	$	- $	- $	- $	- $	852 $	2,322 $	2,369 $	2,416 $	2,248 $	1,926 $	1,965 $	2,004 $	2,044 $	2,085 $	1,334 $ 21,568
Total Technology Operating Costs	$	- $	- $	- $	- $	930 $	2,535 $	2,586 $	2,638 $	2,457 $	2,111 $	2,153 $	2,196 $	2,240 $	2,285 $	1,462 $ 23,593
Ongoing Business Costs																
Capital	$	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $	- $ -
Operating	$	- $	- $	- $	- $	- $	88 $	784 $	243 $	247 $	252 $	257 $	263 $	268 $	273 $	175 $ 2,830
Total Ongoing Business Costs	$	- $	- $	- $	- $	- $	88 $	784 $	243 $	247 $	252 $	257 $	263 $	268 $	273 $	175 $ 2,830
Ongoing Cash flow Benefits																
Capital	$	- $	- $	- $	- $	- $	- $	2,266 $	6,955 $	11,311 $	15,379 $	17,653 $	17,986 $	18,345 $	18,712 $	19,087 $ 127,645
Operating	$	- $	- $	- $	- $	- $	- $	1,201 $	3,674 $	5,988 $	8,130 $	9,324 $	9,510 $	9,701 $	9,895 $	10,093 $ 67,516
Total Benefits	$	- $	- $	- $	- $	- $	- $	3,467 $	10,609 $	17,299 $	23,501 $	26,957 $	27,496 $	28,046 $	28,607 $	29,179 $ 195,162
Net Savings																
Capital Savings	$	- $	- $	- $	- $	(78) $	(213) $	2,049 $	6,713 $	11,102 $	15,186 $	17,445 $	17,794 $	18,150 $	18,513 $	18,959 $ 125,620
Operating Savings	$	- $	- $	- $	- $	(852) $	(2,410) $	(1,993) $	1,016 $	3,468 $	5,951 $	7,332 $	7,244 $	7,388 $	7,536 $	8,549 $ 48,118
Savings Total	$	- $	- $	- $	- $	(930) $	(2,623) $	117 $	7,729 $	14,594 $	21,137 $	24,547 $	25,038 $	25,538 $	26,049 $	27,542 $ 168,739
Discounted Cash Flow (DCF)	$	- $	(309) $	(3,995) $	(24,368) $	(27,274) $	(4,254) $	117 $	7,729 $	14,594 $	21,137 $	24,547 $	25,038 $	25,538 $	26,049 $	27,542 $ 112,092
NPV of DCF - Expected Cost + Monetized Benefits		$ 41,785														

In Appendix F, Tab G2 – (RR Analysis Inputs), BC Hydro calculates Table 1: SCA Expected Cost + Monetized Benefits as follows:



SCA Expected Cost

Table 1: SCA Expected Cost + Monetized Benefits

Fiscal Year	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30	Totals
Project Capital	$ 2,650	$ 7,981	$ 3,490	$ 21,417	$ 21,344	$ 1,245										$ 58,127
Project Operating	$ 1,351	$ 0	$ 505	$ 2,950	$ 5,000	$ 387										$ 10,193
Project IDC	$ 47	$ 120	$ 187	$ 927	$ 1,699	$ -										$ 2,979
Capital Addition (10 year life)					$ 61,107											$ 61,107
Ongoing Capital Savings			$ -	$ -	$ (98)	$ (266)	$ 1,995	$ 6,658	$ 11,028	$ 15,083	$ 17,339	$ 17,686	$ 18,040	$ 18,401	$ 18,887	$ 124,753
Ongoing Operating Savings			$ -	$ -	$ (918)	$ (2,588)	$ (2,114)	$ 830	$ 3,087	$ 5,171	$ 6,306	$ 6,432	$ 6,560	$ 6,692	$ 8,043	$ 37,501

1.16.5.1 Please provide revised tables for either Appendix F, Tab G1 or Tab G2 as needed, as well as a revised Table 3-7.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.16.5.

17.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Appendix F, Tab F1; Phase One Application,
Exhibit B-1, Attachment F, Tab F1; Appendix H, pp. 15 to 53
Benefits list

In Tab F1 of Attachment F in the Phase One Application, BC Hydro states that the "Years to Benefit" is 3 years and 4 years for Benefit ID 13 and Benefit ID 35, respectively.

In Tab F1 of Appendix F of the Application, the "Years to Benefit" are 5 years and 3 years, respectively, for Benefit ID 13 and Benefit ID 35.

1.17.1 Please explain why the number of "Years to Benefit" for Benefit ID 13 increased from 3 years to 5 years in the Application as compared to the Phase One Application.

RESPONSE:

The 'Years to Benefit' number was inadvertently increased on Benefit ID No. 13 due to the fact that the 'Units' column (column J) in Tab F1 in Appendix F was not populated with an "H" for Hours so the formula under 'Years to Benefit' defaulted to five years, which is when cost benefits are expected to be at 100 per cent.

Benefit ID No. 13 is no longer quantified or monetized so there was no impact to the SCA Project's expected or monetized benefits discussed in the Verification Report.

17.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Appendix F, Tab F1; Phase One Application,
Exhibit B-1, Attachment F, Tab F1; Appendix H, pp. 15 to 53
Benefits list

In Tab F1 of Attachment F in the Phase One Application, BC Hydro states that the "Years to Benefit" is 3 years and 4 years for Benefit ID 13 and Benefit ID 35, respectively.

In Tab F1 of Appendix F of the Application, the "Years to Benefit" are 5 years and 3 years, respectively, for Benefit ID 13 and Benefit ID 35.

1.17.2 Please explain why the number of "Years to Benefit" for Benefit ID 35 decreased from 4 years to 3 years in the Application as compared to the Phase One Application.

RESPONSE:

In the Phase One Application, the 'Years to Benefit' for Benefit ID No. 35 was set at four years rather than the default three years for effort benefits. This was to acknowledge that this benefit would take longer to be fully realized due to dependencies on upstream processes that still needed to mature. During the Design stage, it was determined that although the SCA Project will deliver the technical capability to enable centralized kitting, centralized kitting will not become widespread until the upstream processes (outside the scope of SCA) are more mature. Therefore, Benefit ID No. 35 was not quantified in the Verification Report. Appendix F, Tab F1 inadvertently shows three years to full realization for this benefit because this is the default for effort benefits. However as indicated in Cell V28, the benefit is no longer quantified, so the use of three years instead of four years has no impact on the Expected or Monetized Benefits.

17.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Appendix F, Tab F1; Phase One Application, Exhibit B-1, Attachment F, Tab F1; Appendix H, pp. 15 to 53 Benefits list

In Tab F1 of Attachment F in the Phase One Application, BC Hydro categorized Benefit ID 80 as a cost reduction benefit and states that the "Years to Benefit" is 5 years.

However, in Tab F1 of Appendix F of the Application, BC Hydro categorizes Benefit ID 80 as an effort reduction benefit and states that the "Years to Benefit" is 3 years.

1.17.3 Please explain why the categorization of Benefit ID 80 changed from a cost reduction benefit to an effort reduction benefit in the Application as compared to the Phase One Application.

RESPONSE:

The Accounts Payable function was insourced from Accenture Business Services for Utilities in May 2018, which changed the nature of this benefit from paying an external service provider (cost) to managing internal resources (effort).

17.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Appendix F, Tab F1; Phase One Application,
Exhibit B-1, Attachment F, Tab F1; Appendix H, pp. 15 to 53
Benefits list

In Tab F1 of Attachment F in the Phase One Application, BC Hydro categorized Benefit ID 80 as a cost reduction benefit and states that the "Years to Benefit" is 5 years.

However, in Tab F1 of Appendix F of the Application, BC Hydro categorizes Benefit ID 80 as an effort reduction benefit and states that the "Years to Benefit" is 3 years.

1.17.4 Please explain why the number of "Years to Benefit" for Benefit ID 80 decreased from 5 years to 3 years in the Application as compared to the Phase One Application.

RESPONSE:

Benefit ID No. 80 changed from a cost benefit to an effort benefit with the insourcing of the Accounts Payable function in May 2018. Effort benefits use a three year ramp-up whereas cost benefits assume a five-year ramp-up.

17.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PROJECT BENEFITS AND NPV ANALYSIS
Exhibit B-1, Appendix F, Tab F1; Phase One Application,
Exhibit B-1, Attachment F, Tab F1; Appendix H, pp. 15 to 53
Benefits list

On pages 15 to 18 of Appendix H of the Application, PwC and BC Hydro list the benefits of the SCA project and classify each benefit into the following five statuses: i) Phase One – Increased; ii) Phase One – Decreased; iii) Phase Two New; iv) Phase One – No Change; and v) Phase One – Removed.

On pages 19 to 53 of Appendix H of the Application, PwC and BC Hydro prepared a Detailed Benefit Analysis for each Benefit No./ID which describe how benefits were modified from the Phase 1 filing to the Phase 2 filing of the Application in the "Rationale for Change" section.

1.17.5 For each benefit with a status other than "Phase One – No Change" and "Phase One – Removed" on pages 15 to 18 of Appendix H, please elaborate on the "Rationale for Change" provided in pages 19 to 58 of Appendix H with respect to the following:

- 100% Benefit at
- Realization ratio; and
- Baseline assumptions/data used in the benefit calculation logic

RESPONSE:

Please refer to the table below for the rationale for change for the requested benefits with regard to the realization ratios and the baseline assumptions and calculations. There has been no change in assumptions since the Phase One Application regarding the timing of when 100 per cent of these benefits will be realized.

The table below excludes new benefits that were not identified in the Phase One Application as there is no change to be rationalized.

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
2	**<u>As outlined in Appendix H:</u>** **The realization ratio has been increased to 70% (50% in Phase 1 filing) based on the greater detail in data availability to quantify the benefit (as compared to the Phase 1 filing).** **<u>BC Hydro's additional comments:</u>** **The Phase One calculation was based on the 24,000 total Purchase Order and Contract Order transactions in F2015 and the assumption that 50% of these could be automated and that 25% were already automated. The Verification Report calculation was based on more recent and detailed analysis of Purchase Orders that could be automated based on contractual pricing availability, master data, and potential use of service masters. With this more refined analysis, BC Hydro had a higher level of confidence in the quantified benefit amount and therefore the realization ratio was not discounted by as much as in Phase One.**	**Updated number of purchase and contract orders and F2018 standard labour rate (SLR) was used in the Verification Report.** **<u>Phase One Calculation Logic:</u>** **There were 24,000 Purchase Order (PO) and Contract Order (CO) transactions in F15. Assuming 1.5 hours / transaction. The business estimates that up to 50% of those transactions could be automated and that 25% already are. SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **4,500 material POs annually, requiring 1.5 hours each to process in the current state can be automated by leveraging contracted pricing stored within the system.** **Additionally, 1,600 service COs annually, requiring 1.5 hours each to process in the current state can be automated with SCA through the use of service masters and contracts. SLR of $83.82/hr was used.**
3	**<u>As outlined in Appendix H:</u>** **The calculation in Phase One used a global approach based on the number of PO and CO transactions,**	**An updated number of purchase and contract orders and F2018 standard labour rate (SLR) was used in the Verification Report**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
	whereas Phase Two takes a more granular approach using the actual number of service-related and material-related transactions which have been adjusted to account for transactions that are already automated as well as those that are likely to remain manual even with SCA. The number of transactions used to calculate the Phase Two benefit represents a more accurate portrayal of transactions that will be automated with SCA thus increasing the realization from 50% to 70%. **<u>BC Hydro's additional comments:</u>** **The more accurate estimate of transactions that can be automated combined with management plans to focus and monitor the compliance on the increased use of material and service masters has resulted in an increased confidence in the quantified benefit amount and therefore the realization ratio was not discounted by as much as in Phase One.**	**<u>Phase One Calculation Logic:</u>** **Same transaction assumptions as #2 Benefit ID No. 2 above (24,000 PO/CO). Assuming 3 hours / transaction (baseline being 2 plus 1 hour of dealing with a buyer). The impact is having to deal with a buyer (1 additional hour) when it could be self-service for 50% of these transactions and 25% are currently automated. SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **Out of a total of 21,055 PO and CO transactions per year, assumption that 4,500 material PO's and 1,600 service CO's can be transitioned to self-serve PRs with SCA Self-service will eliminate an estimated 1 hour of end user time in not having to deal with a buyer to explain/clarify what it is they are requesting. SLR of $83.82/hr was used.**
5	**No change from the Phase One Application.**	**Benefit value is higher in the Verification Report due to increase in cost benefit from 0.5 per cent of addressable spend to 1.5 per cent of addressable spend.** **The Phase One approach focused on BC Hydro's improved ability**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		to negotiate commercial terms with better data and visibility to demand (savings of 0.5% of overall spend). The revised approach in the Verification Report takes a broader focus to quantify the benefits from active contract and supplier management, to not only negotiate better terms but also to mitigate value leakage. **<u>Phase One Calculation Logic:</u>** **The baseline is the total F16 addressable spend ($2.5 billion materials & services that flow through the supply chain) minus inventoried materials spend ($200 million, excluded because stock materials are included in item #60). Potential savings are estimated to be 0.5% of the baseline.** **<u>Verification Report Calculation Logic:</u>** **Using a baseline of $2.14 billion in addressable spend (F18 spend managed through procurement process), a reduction of 1.5% is achievable via supplier spend reduction through active contract and supplier management.**
7	**No change from the Phase One Application.**	**No change in methodology and underlying assumptions from Phase One Application, other than to update the standard labour rate (SLR) to reflect BC Hydro's F2018 SLR.** **<u>Phase One Calculation Logic:</u>** **Approximately 4,000 people work in PassPort performing supply**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		chain functions. Estimated that 50% are involved in downstream activities, spending 10% of their annual effective time (1586 hours) managing contracts. A conservative estimate is that 30% of their time is inefficient. SLR of $82/hr was used. **<u>Verification Report Calculation Logic:</u>** **No change in methodology and underlying assumptions. SLR of $83.82/hr was used.**
10	**No change from the Phase One Application**	**The calculation in Phase One eliminated all effort associated with locating missing information during contract renewals. The approach in the Verification Report considers that batch modification of pricing will be enabled for all contracts. The current system requires manual update for contracts within the system for each line. SCA will enable mass upload of contract data and updates. The approach in the Verification Report also further refines the number of contracts expected to be renewed each year and those that will go to market. F2018 standard labour rate (SLR) was used in the Verification Report.** **<u>Phase One Calculation Logic:</u>** **Approximately 1,500 contracts expire per year. Assume 5 hours per contract to renew using standard conditions. When information required to renew the contract is missing it takes an additional 10 hours (for a total of 15 hours). It is estimated that**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		information is missing from roughly 1/3 of all contracts (500/1500). SLR of $82/hr was used. **<u>Verification Report Calculation Logic:</u>** **Of the 2,045 contracts that expire per year, 1,154 are either not renewed or already have accessible data and are therefore excluded from this benefit. This leaves a baseline of 891 contracts. Time savings are estimated to be 3 hours per contract due to mass upload capability. For the 20% (178) of these contracts that will go to market, an additional 10 hours are expected to be saved due to better availability of data in the system. SLR of $83.82 was used.**
14	**<u>As outlined in Appendix H:</u>** **The methodology of quantifying this benefit has not changed from the Phase One filing. Revision of this benefit value is a result of updates to inventory levels and current inventory turns. The industry benchmark mean for inventory turn of 2.79 is used for the calculations. The realization ratio has been increased to 75% (50% in Phase One filing) based on high success rates with other Utilities.** **<u>BC Hydro's additional comments:</u>** **Given the higher levels of inventory levels currently carried and the management plans to focus efforts on**	**Updated inventory levels and inventory turns from F2018 were used for the Verification Report.** **<u>Phase One Calculation Logic:</u>** **The current inventory turn metric for active stock materials is 1.6 on $200 million annual spend ($125 million active stock on hand) costing $5.6 million per year in carrying costs. BC Hydro estimates that the inventory turn metric that could be achieved is 2.79 (the industry average) which would result in a savings of $2.4 million a year in lower carrying costs.** **<u>Verification Report Calculation Logic:</u>** **The current inventory turn metric for active stock materials is 1.21**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
	utilizing the SCA solution to manage the accuracy of material needs dates (for Demand Management) in addition to the success rates realized in other utilities, the realization rate was increased.	**(1.6 on or $125M in active inventory in Phase 1 filing). The current level of active stock on hand is $160Million. Assuming a 3.95% carrying cost (4.5% in Phase One filing), this results in baseline carrying costs of $6.3Million per year. By improving the inventory turn metric to 2.79, savings of $2.7 Million can be captured.**
16	**<u>As outlined in Appendix H:</u>** **It is identified that manual material reservation affects warehouse operations. Effort savings for field store keepers is identified. Labor rate for demand planners and field store keepers is set to lower SLR for this benefit (Demand Planners: $82.00/hr in Phase 1, $62.47/hr in Phase Two; Field store keepers: $53.49/hr in Phase Two).** **<u>BC Hydro's additional comments:</u>** **As the SCA design is expected to entirely eliminate this effort and BC Hydro is able to accurately estimate the current effort required and the positions impacted, the realization ratio was increased to 100%.**	**During the Design Stage, it became apparent that this benefit would impact warehouse operations (field storekeepers), as well as demand planners. Therefore an 2.5 additional full-time equivalent positions were deemed to be impacted by this benefit. The SLR was also updated to F2018 rates for the impacted positions (rather than using average SLR across all positions).** **<u>Phase One Calculation Logic:</u>** **There are 2.5 people performing this function at MMBU. This effort should no longer be required (2.5 x 1,586 hours). SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **5 FTEs in total are performing or impacted by this function, spending a total of 7,555 hours. With SCA, this effort will not be required. Blended SLR of $57.26/hr used (representing the SLR for the specific roles).**
19	**No change from the Phase One Application.**	**Updated number of invoices (F2018 actuals) was used for the Verification Report. F2018 standard labour rate (SLR) was used.**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		<u>Phase One Calculation Logic:</u> **Approximately 144,000 invoices / year. Assuming there are issues with 5% and that tracking the invoice through multiple systems adds 20 minutes of additional effort to resolving the issue. SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **Same calculation logic. Number of invoices / year updated to 123,596. SLR of $83.82/hr was used.**
26	**No change from the Phase One Application.**	**Updated number of invoices (F2018) and a more refined segmentation of the invoices were used for the Verification Report. F2018 standard labour rate (SLR) was used.** **<u>Phase One Calculation Logic:</u>** **BC Hydro processes 144,000 invoices per year. It is estimated (based on the distribution of spend) that 75% are for services and are manually approved. It is also estimated that to approve an invoice takes on average 1 hour total effort (submitter, reviewer, and approver) and that 30% of invoices are more complicated and take 2 hours. SLR of $82/hr used.** **<u>Verification Report Calculation Logic:</u>** **Benefits were estimated based on 123,596 invoices (F12018**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		actuals). Of the 123,596 invoices, 30% are assumed to be complicated invoices while the remaining 70% are assumed to be no touch or one touch invoices. **Complicated invoices: currently require 2 hours to resolve. With SCA, this will be reduced to 0.5 hours due to increased visibility of data from demand planning to payment (an effort savings of 1.5 hours per invoice).** **Simple - No touch or one touch invoices: a) 12% are for material and b) 88% are for services.** **a) Material invoices: 25% are free text. SCA will streamline this process via 2-way matching and reduce the effort required per invoice from 1 hour to 0.25 hours (an effort saving of 0.75 hours per invoice). The remaining 75% of material invoices are already managed through 3-way matching and the effort required will not change after the implementation of SCA.** **b) Service invoices: Of all service invoices, 50% are 2-way match invoices, 25% are 3-way match or ERS (evaluated receipt settlement) invoices, and 25% are no match or manual effort required invoices. For invoices with 2-way match, SCA will result in a streamlined system based approval process and reduce the effort required per invoice from 1 hour to 0.25 hours (an effort saving of 0.75 hours per invoice). For invoices with 3-way match or ERS, there will be a service**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		master associated with each invoice (3-way match with PO, receipt, and invoice) resulting in no approval required, or an automatic match and automatic invoice (ERS). This will reduce effort from 1 hour to 0 hours, a net effort saving of 1 hour. Finally, the remaining 25% of service invoices will require manual effort with no effort savings and will need same effort as current. **SLR or $83.82 was used. Please refer to page 22 of Appendix H for a graphical representation of the Verification Report calculation logic.**
29	**<u>As outlined in Appendix H:</u>** **Original quantification relied on approximating accrual volume from overall invoice volume. The Phase Two filing method is based on actual accrual volumes. The realization ratio has been increased to 60% (50% in Phase One filing) based on the availability of detailed information.** **<u>BC Hydro's additional comments:</u>** **With this more refined analysis, and further discussions with stakeholders to corroborate the time spent on accruals, BC Hydro had a higher level of confidence in the quantified benefit amount and therefore the realization ratio was not discounted by as**	**The Phase One benefit estimate was based on assumptions about the percent of invoices that need to be accrued. The Verification Report was based on a refined analysis using actual number of invoices accrued in F2018. F2018 standard labour rate (SLR) was used in the Verification Report.** **<u>Phase One Calculation Logic:</u>** **Assume that processing the accrual for an invoice (total across all business units) is approximately 30 minutes of time per invoice that has to be accrued. Using the same logic as Benefit ID. No. #26, 75% of all invoices are manually approved. Assume that 80% of manually approved invoices require an accrual (smaller invoices, 20%, don't require accruals). SLR of $82/hr was used.**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
	much as in Phase One.	**<u>Verification Report Calculation Logic:</u>** **Based on the 73,881 invoices accrued in F18. It is assumed that 30 minutes of effort will be saved by SCA per accrued invoice for identification and reconciliation of accruals. SLR of $83.82 was used.**
45	**No change from the Phase One Application**	**Phase One used an estimated number of CR/CO pairs that occur under projects, whereas the Verification Report used actual number of CR/CO pairs under projects. The Verification Report used F2018 standard labour rate (SLR).** **<u>Phase One Calculation Logic:</u>** **BC Hydro estimates that there are 1,000 CR/CO transaction pairs per year that occur under projects. For each of these transaction pairs both the CR (initial) and CO (award) transactions must be approved. Each approval requires on average 2.5 people to approve (increasing number of people with higher financial amounts) and each approval takes approximately 10 minutes in the system. The benefit would be the elimination (under SAP) of the second approval. SLR of $82/hr was used.**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		<u>Verification Report Calculation Logic:</u> **There are 1,330 CR/COs under projects per year. For each of these transaction pairs both the CR (initial) and CO (award) transactions must be approved. Each approval requires on average 2.5 people to approve (increasing number of people with higher financial amounts) and each approval takes approximately 10 minutes in the system. The auto PO will reduce the effort required for approvals by 1, leading to a reduction in effort by 554 hours. Secondary approval will not be required. SLR of $83.82/hr was used.**
58	**<u>As outlined in Appendix H:</u>** **The realization ratio has been increased to 70% (50% in Phase One filing) based on certainty of solution design to address this current pain point.** **<u>BC Hydro's additional comments:</u>** **The SCA solution will eliminate the need to track material requirements manually in spreadsheets by automating needs dates availability. Better understanding of the design and identification of the positions impacted provides more confidence in ability to realize the quantified benefit.**	**The benefit value is increased due to a higher realization ratio, but this is offset due to a lower standard labour rate (SLR) to reflect the specific positions impacted.** **<u>Phase One Calculation Logic:</u>** **The project estimates that approximately 20 planners spend 1 hour a week manually tracking items because they can't see them in the system. SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **The project estimates that approximately 20 planners spend 1 hour a week manually tracking items because they can't see**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
		them in the system. SLR of $64.53/hr was used (based on F2018 SLRs for the positions impacted.
67	**<u>As outlined in Appendix H:</u>** **The realization ratio has been increased to 70% (50% in Phase One filing) based on the large scale at which service masters are planned to be implemented with SCA in place. Outline agreements will further streamline the workflow. Effort will be reduced for groups of end users with high volume repetitive service usage.** **<u>BC Hydro's additional comments:</u>** **The more accurate estimate of transactions combined with management plans to focus on and monitor the compliance with the increased use of outline agreements and service masters has resulted in an increased realization rate for this benefit.**	**The calculation logic is unchanged from the Phase One Application. Inputs have been updated with the F2018 actual Contract Order (CO) volumes. F2018 standard labour rate (SLR) was used in the Verification Report.** **<u>Phase One Calculation Logic:</u>** **There are 24,000 CO/PO transactions. Assume that 70% of those are for COs, and that 50% of those are for simple services that could be requested through a catalogue. Currently the requester spends approximately 2 hours defining and approving the scope of work. With a catalogue this could be reduced to 15 minutes (saving 105 minutes). SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **There were 11,605 service transactions in F18, and 50% of those are for simple services that could be requested through a catalogue, requesters can reduce their efforts from 2 hours (defining and approving the scope of work for each CO) to 15 minutes, leading to a savings of 105 minutes per CO. SLR of $83.82/hr was used.**

Benefit ID No.	Rationale for Change	
	Realization Ratio	**Baseline Assumptions / Data Used in Calculation Logic**
79	**No change from the Phase One Application.**	**No change from the Phase One Application other than an update to reflect the F2018 standard labour rate (SLR). Phase One SLR was $82/hr. Verification Report SLR was $83.82/hr.**
81	**No change from the Phase One Application.**	**A more refined standard labour rate (SLR) was used in the Verification Report as the positions impacted by this benefit are better known and isolated to one area.** **<u>Phase One Calculation Logic:</u>** **BC Hydro runs 500 to 800 sourcing events annually. Approximately 5% of the time a sourcing event is started and then stopped after realizing that an appropriate contract is already in place. It is estimated that the wasted time per stopped event is 5 hours for complex events and 2 hours for simple events with a 50/50 ratio between complex and simple events. SLR of $82/hr was used.** **<u>Verification Report Calculation Logic:</u>** **No change in rationale. SLR of $66.02/hr was used, reflecting clerical nature of the role where this benefit will be realized.**

18.0 C. PROJECT BENEFITS AND NET PRESENT VALUE (NPV) ANALYSIS

Reference: PwC CONCLUSION & SUMMARY ON SCA BENEFITS ANALYSIS POST DESIGN PHASE 18.0

Exhibit B-1, Appendix G, p. 9 Benefits dependencies

On page 9 of Appendix G to the Application, PwC states that the realization of benefits will be dependent on the adoption of tools available to BC Hydro, the level of change management that goes into project implementation and governance and benefits tracking. PwC states that the following dependencies are overarching to all benefits identified in the review:

- Master data management;
- Governance and benefits tracking;
- Supplier engagement;
- Demand management; and
- Change management.

1.18.1 Please discuss how BC Hydro will address each dependency to ensure the realization of the benefits.

RESPONSE:

BC Hydro has included activities in the SCA Project plan to address these dependencies, and will be incorporating additional activities in the detailed benefits realization and sustainment plans that will be developed during Implementation phase.

- **Master Data Management: The SCA project has developed process flows for the creation and maintenance of material and service masters and is currently developing a framework for master data governance and stewardship, which will leverage the SCA Project's governance structure and eventually transition to permanent business owners after the SCA Project is closed;**

- **Governance and Benefits Tracking: As outlined in Appendix I of the Verification Report, BC Hydro has identified key performance indicators and is establishing procedures for accountabilities for ongoing benefits tracking as part of the overall benefits realization plan. As discussed in BC Hydro's response to BCUC IR 1.9.1, BC Hydro's Supply Chain sustainment team will provide oversight for monitoring and enforcing compliance with business processes and the tracking and reporting of SCA benefits;**

- **Supplier Engagement: BC Hydro is committed to executing on savings opportunities and engaging with suppliers to hold them to contractual commitments, service levels and obligations. Indeed, this is a key component of Benefit ID No. 5 (Active Contract and Supplier Relationship Management), and the SCA project will provide BC Hydro with the tools and access to data to enable this activity;**

- **Demand Management: Commitment to accuracy of material needs dates used in work orders and projects, and consistent definition of "needs dates" across BC Hydro operating groups have been identified as key dependencies for Benefit ID No. 14 (Reduction of cost of capital through an increase in inventory turns). BC Hydro will incorporate activities to address the dependencies in the SCA Project's Change Management Plan; and**

- **Change Management: The SCA Project's Change Management Strategy is included as Appendix O of the Verification Report. Additionally, page 4-10 of the Verification Report (Detailed Impact and Training Needs Assessments) identifies that full adoption of the SCA changes and their related benefits will require a high degree of change management effort with substantial leadership support, engagement, and shifts in current organizational behaviours. The specifics tactics and activities related to this effort will be included in the detailed Change Management Plan completed in the Implementation Phase.**

In addition, key dependencies are listed in the benefits tracking sheets and will be monitored on an ongoing basis.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

Table 4-1 on page 4-4 of the Application provides a description of the scope components outlined in the Phase One Application and a discussion of any updates that have occurred:

Table 4-1 Scope Description and Updates

Ref	Scope Component	Discussion of Updates
1	**Materials Management –** inventory management, forecasting and demand planning, material requirements planning, and warehouse operations for all materials.	No material change to the scope from the Phase One Application
2	**Purchasing –** purchasing processes, contract administration and invoice processing for all materials and services.	No material change to the scope from the Phase One Application. A minor change is discussed in the section on the changes to the Conceptual Design Report in the Mobilization Stage. See section 4.3.2.2.
3	**Integration –** integration of SAP Supply Chain modules with other previously implemented SAP modules (Project System, Finance & Controlling, Quality Management, and other systems such as PassPort (work management), Oracle Primavera Unifier Construction Contract Management (**Unifier**), and Supply Chain Workspace (sourcing, category, and contract management).	No material change to the scope from the Phase One Application. A minor change is that there is no longer a need to integrate SAP with Oracle Primavera Unifier. See section 4.3.2.2. An amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes. See section 2.3.1.1.
4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
5	Expanded use of other IT Applications designed to work with SAP: SAP Business Warehouse; Ariba; and Fiori.	No material change to the scope from the Phase One Application

On page 4-7 of the Application, BC Hydro states that the Conceptual Design Report was updated prior to its use in the Design and Implementation Planning Stage to reflect the changes to BC Hydro's IT landscape since 2015. BC Hydro further states:

BC Hydro decided to consolidate the management of all contingent labour resources through an external managed service provider. BC Hydro selected a vendor, Flextrack Inc., to procure and manage contingent labour using a cloud-based IT system called the Vendor Management System (**VMS**). VMS will function as a "bolt-on" to SAP, extending its capabilities in this area, and

requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

On pages 4-7 to 4-8 BC Hydro explains that the SAP to Oracle Primavera Unifier interface has been removed from the scope:

Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

In Table 4-1 BC Hydro states that "an amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes."

On page 4-8 of the Application, BC Hydro states that it did not proceed with the Graphics Work Design Project and therefore references to it have been removed from the Conceptual Design Report. BC Hydro explains:

The Conceptual Design Report considered the Graphic Work Design Project that would combine BC Hydro's AutoCAD and geographic information system engineering tools even though no direct interactions between the Graphic Work Design tool and SAP supply chain were expected.

On page 4-8 of the Application BC Hydro states:

Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1 For each of the following scope items please provide responses to IRs 19.1.1 to 19.1.7 below:

- Selection of Flextrack VMS for the management of all contingent labour resources;
- Removal of SAP to Unifier interface;
- Removal of Graphics Work Design Project; and
- Removal of dynamic discounting.

RESPONSE:

Please refer to BC Hydro's response to BCUC IRs 1.19.1.1 to 1.19.1.7.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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3	**Integration –** integration of SAP Supply Chain modules with other previously implemented SAP modules (Project System, Finance & Controlling, Quality Management, and other systems such as PassPort (work management), Oracle Primavera Unifier Construction Contract Management (**Unifier**), and Supply Chain Workspace (sourcing, category, and contract management).	No material change to the scope from the Phase One Application. A minor change is that there is no longer a need to integrate SAP with Oracle Primavera Unifier. See section 4.3.2.2. An amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes. See section 2.3.1.1.
4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
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On page 4-7 of the Application, BC Hydro states that the Conceptual Design Report was updated prior to its use in the Design and Implementation Planning Stage to reflect the changes to BC Hydro's IT landscape since 2015. BC Hydro further states:

BC Hydro decided to consolidate the management of all contingent labour resources through an external managed service provider. BC Hydro selected a vendor, Flextrack Inc., to procure and manage contingent labour using a cloud-based IT system called the Vendor Management System (**VMS**). VMS will function as a "bolt-on" to SAP, extending its capabilities in this area, and

requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

On pages 4-7 to 4-8 BC Hydro explains that the SAP to Oracle Primavera Unifier interface has been removed from the scope:

Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

In Table 4-1 BC Hydro states that "an amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes."

On page 4-8 of the Application, BC Hydro states that it did not proceed with the Graphics Work Design Project and therefore references to it have been removed from the Conceptual Design Report. BC Hydro explains:

The Conceptual Design Report considered the Graphic Work Design Project that would combine BC Hydro's AutoCAD and geographic information system engineering tools even though no direct interactions between the Graphic Work Design tool and SAP supply chain were expected.

On page 4-8 of the Application BC Hydro states:

Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1.1 Please provide a breakdown of any costs spent to date on the scope items which have been removed and discuss BC Hydro's proposal with respect to the recovery of these costs.

RESPONSE:

There have been no SCA Project costs to date related to the removed scope items. Three of the four items (the cross-application timesheet function for contingent labour timesheets, the Graphic Work Design project, and dynamic discounting) had been removed from scope prior to the start of the Design and Implementation Planning Stage and hence incurred no design effort or cost.

For the Unifier interface, no design time was expended on the interface. Time was spent to design the processes related to the interactions between SAP and Unifier, but this work would have been required regardless of whether an interface was included. Had the Unifier interface remained in scope, detailed design work related to it would have taken place in the Implementation Phase.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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3	**Integration –** integration of SAP Supply Chain modules with other previously implemented SAP modules (Project System, Finance & Controlling, Quality Management, and other systems such as PassPort (work management), Oracle Primavera Unifier Construction Contract Management (**Unifier**), and Supply Chain Workspace (sourcing, category, and contract management).	No material change to the scope from the Phase One Application. A minor change is that there is no longer a need to integrate SAP with Oracle Primavera Unifier. See section 4.3.2.2. An amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes. See section 2.3.1.1.
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BC Hydro decided to consolidate the management of all contingent labour resources through an external managed service provider. BC Hydro selected a vendor, Flextrack Inc., to procure and manage contingent labour using a cloud-based IT system called the Vendor Management System (**VMS**). VMS will function as a "bolt-on" to SAP, extending its capabilities in this area, and

requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

On pages 4-7 to 4-8 BC Hydro explains that the SAP to Oracle Primavera Unifier interface has been removed from the scope:

Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

In Table 4-1 BC Hydro states that "an amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes."

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On page 4-8 of the Application BC Hydro states:

Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1.2 Please discuss the reasons for removing the scope item from the SCA Project.

RESPONSE:

Please see below the reasons for removing these items from the SCA Project:

- **Selection of Flextrack VMS for the management of all contingent labour resources: As a result of BC Hydro's decision to consolidate the management of all contingent labour resources through an external service provider, some functions for managing theses resources are no longer required to be in SAP, and hence were removed from the scope of the SCA project. The function removed from scope was the use of SAP's internal timesheet application for managing the entry and approval of contingent labour resources' time. This function will be provided by the Flextrack cloud-based Vendor Management System;**

- **Removal of SAP to Unifier interface: During the Design Stage, it was determined there was no requirement for detailed contract line-item information to be automatically interfaced to Unifier from SAP. Instead, as needed for some contracts, business users will manually update information in Unifier as is the current practice;**

- **Removal of Graphics Work Design Project: At the completion of the Graphic Work Design project's Definition Phase, it was determined that the project's business case did not warrant proceeding to the Implementation phase, and hence the project was cancelled. This had no impact on the scope of the SCA Project as no direct interactions between the planned AutoCAD tool and SAP were expected to be required. The updates to the Conceptual Design Report to remove the references to the Graphic Work Design Project were made in order to more accurately reflect the technical environment in which the SCA solution would operate; and**

- **Removal of dynamic discounting: The dynamic discounting capability was implemented under a separate project and was put into service in November of 2015. Mention of Dynamic Discounting should have been removed from the Conceptual Design Report prior to the submission of the Phase One Application.**

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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3	**Integration –** integration of SAP Supply Chain modules with other previously implemented SAP modules (Project System, Finance & Controlling, Quality Management, and other systems such as PassPort (work management), Oracle Primavera Unifier Construction Contract Management (**Unifier**), and Supply Chain Workspace (sourcing, category, and contract management).	No material change to the scope from the Phase One Application. A minor change is that there is no longer a need to integrate SAP with Oracle Primavera Unifier. See section 4.3.2.2. An amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes. See section 2.3.1.1.
4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
5	Expanded use of other IT Applications designed to work with SAP: SAP Business Warehouse; Ariba; and Fiori.	No material change to the scope from the Phase One Application

On page 4-7 of the Application, BC Hydro states that the Conceptual Design Report was updated prior to its use in the Design and Implementation Planning Stage to reflect the changes to BC Hydro's IT landscape since 2015. BC Hydro further states:

BC Hydro decided to consolidate the management of all contingent labour resources through an external managed service provider. BC Hydro selected a vendor, Flextrack Inc., to procure and manage contingent labour using a cloud-based IT system called the Vendor Management System (**VMS**). VMS will function as a "bolt-on" to SAP, extending its capabilities in this area, and

requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

On pages 4-7 to 4-8 BC Hydro explains that the SAP to Oracle Primavera Unifier interface has been removed from the scope:

Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

In Table 4-1 BC Hydro states that "an amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes."

On page 4-8 of the Application, BC Hydro states that it did not proceed with the Graphics Work Design Project and therefore references to it have been removed from the Conceptual Design Report. BC Hydro explains:

The Conceptual Design Report considered the Graphic Work Design Project that would combine BC Hydro's AutoCAD and geographic information system engineering tools even though no direct interactions between the Graphic Work Design tool and SAP supply chain were expected.

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Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1.3 Please confirm, or explain otherwise, whether the removal of the scope item led to project cost savings.

RESPONSE:

Please find below the explanation requested:

- **Selection of Flextrack Vendor Management System (VMS) for the management of all contingent labour resources did not result in project cost savings. While the selection of the Flextrack VMS has resulted in the removal of the use of SAP's cross-application timesheet solution (CATS) for contingent labour resources, this reduction is offset by the need to incorporate the requirements of managing this data via a bolt-on tool into the overall solution. Configuration of the cross-application timesheet solution for contingent labour was a minor scope element given that it is already in use at BC Hydro for managing employee time entries;**

- **Removal of SAP to Unifier interface resulted in a reduction in the SCA Project's Expected Amount of $0.3 million in capital. However, given the risk that the Unifier interface may still be required to meet Site C's business requirements, and hence may be brought back into scope, this amount was included as a specific reserve amount;**

- **Removal of Graphics Work Design Project did not result in project cost savings as the SCA Project's scope did not include any planned interactions between the Graphic Work Design tool and the SCA solution; and**

- **Removal of Dynamic Discounting did not result in project cost savings as the update to the Conceptual Design Report was made in order to reflect that Dynamic Discounting had been previously implemented. This update should have been made prior to filing the Phase One Application.**

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

Table 4-1 on page 4-4 of the Application provides a description of the scope components outlined in the Phase One Application and a discussion of any updates that have occurred:

Table 4-1 Scope Description and Updates

Ref	Scope Component	Discussion of Updates
1	**Materials Management –** inventory management, forecasting and demand planning, material requirements planning, and warehouse operations for all materials.	No material change to the scope from the Phase One Application
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4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
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requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

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Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

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Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1.3 Please confirm, or explain otherwise, whether the removal of the scope item led to project cost savings.

1.19.1.3.1 If confirmed, please quantify and provide a breakdown of the cost savings into operating and capital costs.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.3.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.1.3 Please confirm, or explain otherwise, whether the removal of the scope item led to project cost savings.

1.19.1.3.2 If not confirmed, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.3.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.1.4 Please discuss whether the removal of the scope item has impacted the project schedule. In your response, please provide details of any impacts.

RESPONSE:

None of these scope changes have had an impact on the SCA Project's overall timeline.

Minor schedule impacts are discussed below:

- **Selection of Flextrack Vendor Management System (VMS) for the management of all contingent labour resources: The timing of specific configuration and testing activities required to support the Flextrack VMS project schedule have been scheduled slightly earlier than originally planned. Please refer to BC Hydro's response to BCUC IR 1.19.1.5 for further discussion; and**

- **Removal of SAP to Unifier interface: While the removal of the Unifier interface from scope is a reduction in the amount of development and testing work required, it is not a significant enough item to have an impact on the project's critical path.**

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.1.5 Please discuss whether the removal of the scope item has impacted the project risks. In your response, please provide

details of any risks related to the scope item and discuss any changes to the risks.

RESPONSE:

- **Selection of Flextrack Vendor Management System (VMS) for the management of all contingent labour resources: Caused a slight increase in project risk as a result of the need to coordinate activities between the Flextrack VMS and SCA Projects. This risk is included as Risk No. 19 in the SCA Project's risk register attached as Appendix P to the Application. This risk continues to be monitored by both projects, and is currently assessed as moderate with a risk score of 6 in the risk register;**

- **Removal of SAP to Unifier interface: Resulted in a reduction in risk as discussed in item 4 in Table 5-1 of the Application;**

- **Removal of Graphics Work Design Project: Did not impact project risk; and**

- **Removal of dynamic discounting: Did not impact project risk.**

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.1.6 Please identify the Phase 1 project benefits to which the scope item was expected to have contributed.

RESPONSE:

There is no impact to the SCA Project's benefits due to the four minor changes in scope. None of the changes in benefits between the Phase One Application and the Verification Report are as a result of these four minor scope changes.

The removal of the SAP cross-application timesheet scope item has had no impact on the SCA Project benefits as this capability will be provided by the new Flextrack VMS tool, and the data will be interfaced back into SAP to enable realization of the relevant benefits.

The removal of the Unifier interface from the project scope also has no impact on the SCA Project benefits. The related project benefits can be delivered regardless of whether the interface exists.

Dynamic Discounting was not expected to impact any of the SCA Project benefits as this capability was already understood to be outside the scope of the SCA Project at the time the Phase One Application benefits were identified.

Please also refer to BC Hydro's response to BCUC IR 1.19.2 for discussion of why the Graphic Work Design project was not expected to impact any of the SCA Project benefits.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
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Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.1.6.1 For each benefit identified in your response to IR 19.1.6, please quantify the contribution.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.6.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

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1.19.1.6.2 If the scope item was not anticipated to impact any of the project benefits, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.6.

19.0 D. PROJECT SCOPE AND ACTIVITIES

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1.19.1.7 Please explain and quantify how the removal of the scope item has impacted the Phase 2 project benefits.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.6.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.2 Please explain why the Graphic Work Design Project was originally considered. Please comment on the objectives and the resulting benefits that were anticipated from the interactions

between the Graphic Work Design tool and SAP supply chain applications.

RESPONSE:

The Graphic Work Design Project was originally considered in order to provide increased efficiency in the design process by implementing a tool combining the graphical designing (i.e. drawing and drafting) tasks and the estimating tasks within the design process. These tasks are currently performed in separate tools, resulting in redundant steps and manual effort. The estimating function within the design process leverages material and service pricing data from the supply chain application solution - stored as estimating compatible units. To support the estimating function, the scope of the SCA Project has always included enhancements to the existing SAP to PassPort interface to pass pricing information from SAP to PassPort.

There are no specific SCA Project benefits as a result of this interaction, as the enhanced SAP to PassPort interface is required to support the current operations. The benefits anticipated to be delivered by the Graphic Work Design project were independent of the SCA project.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

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1.19.3 Please clarify whether the objectives and the benefits identified in your response to IR 19.2 are to be achieved through other aspects of the Project.

RESPONSE:

As discussed in BC Hydro's response to BCUC IR 1.19.2, the objectives and benefits of the Graphic Work Design Project were independent of the objectives and benefits of the SCA Project. It is not within the scope of the SCA Project to meet the objectives or benefits that were anticipated to be delivered by the Graphic Work Design Project. It is within the scope of the SCA Project to enhance the existing SAP to PassPort interface in order to provide pricing data to support the current compatible unit design estimating process. This requirement and resulting scope item exist regardless of whether the design estimating is executed in PassPort (as it is today) or in a new Graphic Work Design tool that leverages the PassPort compatible unit data.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
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1.19.3 Please clarify whether the objectives and the benefits identified in your response to IR 19.2 are to be achieved through other aspects of the Project.

1.19.3.1 If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.3.

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The Conceptual Design Report considered the Graphic Work Design Project that would combine BC Hydro's AutoCAD and geographic information system engineering tools even though no direct interactions between the Graphic Work Design tool and SAP supply chain were expected.

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Dynamic discounting is a capability within SAP's Ariba that enables vendors, by offering BC Hydro a discount, to opt to receive payment for their invoices earlier than the stated standard payment term. As dynamic discounting has been implemented since November 2015, the reference to it was removed from the Conceptual Design Report.

1.19.4 Given that the integration of SAP to Unifier is not required for the SCA Project, please explain the reasons why it may be required for the Site C project.

RESPONSE:

At the time of the filing of the Verification Report, the integration of SAP to Unifier was identified as a potential requirement to support the Site C Project. The Site C Project manages a very large volume of contract line item data in Unifier due to the size and complexity of its construction contracts. There was a concern that the lack of an interface might result in an unmanageable amount of manual effort for Site C Project's contract managers. Further analysis on whether integration between SAP and Unifier is required for the Site C Project has been carried out since the Verification Report was filed, indicating that the integration is most likely not required as the absence of an interface would not result in any additional manual effort. BC Hydro expects to finalize its decision on this topic by the end of February 2019.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

Table 4-1 on page 4-4 of the Application provides a description of the scope components outlined in the Phase One Application and a discussion of any updates that have occurred:

Table 4-1 Scope Description and Updates

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1	**Materials Management –** inventory management, forecasting and demand planning, material requirements planning, and warehouse operations for all materials.	No material change to the scope from the Phase One Application
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3	**Integration –** integration of SAP Supply Chain modules with other previously implemented SAP modules (Project System, Finance & Controlling, Quality Management, and other systems such as PassPort (work management), Oracle Primavera Unifier Construction Contract Management (**Unifier**), and Supply Chain Workspace (sourcing, category, and contract management).	No material change to the scope from the Phase One Application. A minor change is that there is no longer a need to integrate SAP with Oracle Primavera Unifier. See section 4.3.2.2. An amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes. See section 2.3.1.1.
4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
5	Expanded use of other IT Applications designed to work with SAP: SAP Business Warehouse; Ariba; and Fiori.	No material change to the scope from the Phase One Application

On page 4-7 of the Application, BC Hydro states that the Conceptual Design Report was updated prior to its use in the Design and Implementation Planning Stage to reflect the changes to BC Hydro's IT landscape since 2015. BC Hydro further states:

BC Hydro decided to consolidate the management of all contingent labour resources through an external managed service provider. BC Hydro selected a vendor, Flextrack Inc., to procure and manage contingent labour using a cloud-based IT system called the Vendor Management System (**VMS**). VMS will function as a "bolt-on" to SAP, extending its capabilities in this area, and

requiring an update in the Conceptual Design Report. Prior to this change, the scope of the SCA Project included plans to expand the use of SAP's cross-application timesheet. BC Hydro has utilized SAP's cross-application timesheet solution for employees since the implementation of the Human Resources and Payroll components of SAP in 2011, and the SCA Project scope included expanding its use to also cover contract resources. As a result of the decision to use a managed service provider for contingent labour, this function will be performed in the Flextrack VMS.

On pages 4-7 to 4-8 BC Hydro explains that the SAP to Oracle Primavera Unifier interface has been removed from the scope:

Oracle Primavera Unifier was being developed when the Conceptual Design Report was written in 2015. The specific required interactions between Unifier and the SAP supply chain system were not known at that time. The uncertainty in the level of integration required between SAP and Unifier was identified as a technology risk in the Phase One Application. The Conceptual Design Report was updated to reflect the actual use of Unifier, resulting in simplified conceptual interactions between Unifier and SAP. As noted in Table 4-1 above, the SAP to Unifier interface has since been removed from scope as a result of the analysis completed in the Design Stage.

In Table 4-1 BC Hydro states that "an amount of $0.3 million has been included in the project reserve in case integration with Unifier is required to support specific Site C processes."

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1.19.5 In the event that the integration of SAP to Unifier is required for the Site C project, please explain at what point in the SCA Project

schedule BC Hydro would expect to decide that the interface is required.

RESPONSE:

BC Hydro expects to finalize its decision as to whether the interface is required by the end of February 2019.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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4	No requirement for additional hardware or user licenses to be purchased or installed for the SAP ERP Central Component.	No material change to the scope from the Phase One Application
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1.19.6 In the event that the integration of SAP to Unifier is required for the Site C project, please explain how the amount of $0.3 million

was determined. In your response, please provide a breakdown of the $0.3 million according to key work activities.

RESPONSE:

The amount was estimated based on the System Integrator's estimating heuristics for a complex two-way interface which established a base cost of $240,000 for the System Integrator's work to develop the interface. An amount of $20,000 was added to cover BC Hydro's time to review and approve the functional and technical specifications, respond to questions, and test the solution. The breakdown of the estimate by work activities is provided in the following table.

Activity	Estimated Cost ($)
System integrator functional specification development and review	**51,000**
System integrator technical specification development and review	**37,000**
System integrator development	**58,000**
System integrator unit testing	**26,000**
System integrator integration testing and user acceptance testing support	**47,000**
System integrator post go-live trouble shooting and defect correction	**22,000**
BC Hydro specification reviews and testing support	**20,000**
Sub-total	**260,000**
Contingency at 15 per cent	**39,000**
Total	**299,000**

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.7 In the event that the integration of SAP to Unifier is required for the Site C project, please confirm, or otherwise explain, whether the project schedule includes a contingency period for the work.

RESPONSE:

The SCA Project's schedule does not contain a specific schedule contingency related to the SAP to Unifier interface. If the interface were to be required, it is expected the development could be completed within the existing schedule. If it were to be determined that the interface cannot be accommodated within the existing schedule, BC Hydro would need to utilize a portion of the general four-month schedule contingency.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
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1.19.7 In the event that the integration of SAP to Unifier is required for the Site C project, please confirm, or otherwise explain, whether the project schedule includes a contingency period for the work.

1.19.7.1 If confirmed, please quantify the time allocated.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.7.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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1.19.7 In the event that the integration of SAP to Unifier is required for the Site C project, please confirm, or otherwise explain, whether the project schedule includes a contingency period for the work.

1.19.7.2 If not confirmed, please explain how the scope of work will be incorporated into the existing project schedule.

RESPONSE:

The work will be completed in parallel with other development and testing activities. Therefore, adding it to the scope of work is not expected to have an impact on the project's critical path.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
Mobilization stage

On page 5-6, Item 4 in Table 5-1 discusses the risk relating to the interface between SAP and the Unifier Construction Contract Management:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
4	Technology	Active, Updated	Interfaces to be developed between SAP and Unifier Construction Contract Management are new to BC Hydro, leading to unclear business needs[2]	BC Hydro will monitor this risk and potentially reduce the scope of the Unifier Construction Contract Management interface if the risk of successful deployment is determined to be too great. Also, BC Hydro will utilize existing and well supported interface technologies.	Planned	Medium probability, low impact.	Analysis completed during Design Stage determined that this interface is not required and it has been removed from scope. Some residual risk remains that the interface will be reintroduced based on Site C specific requirements. Specific reserve amount included in estimate.	Monitoring	Low probability: Impact estimated at $0.3 million.

1.19.8 Please discuss the likelihood that the SAP to Unifier interface will be required for the Site C project.

RESPONSE:

BC Hydro considers it unlikely that the Unifier interface will be required for the Site C Project. The SCA Project team has worked with representatives from the Site C Project since the start of Implementation Phase to confirm that the proposed design (that does not include an SAP to Unifier interface) will sufficiently meet their business requirements. This work indicates that the interface will most likely not be required. BC Hydro expects to complete this work and make a final decision on the need for a Unifier interface by the end of February 2019.

19.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: DEFINITION PHASE
Exhibit B-1, Section 4.2.2, p. 4-4; Section 4.3.2.2, pp. 4-7 to 4-8; Section 5.3, pp. 5-3 to 5-13
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4	Technology	Active, Updated	Interfaces to be developed between SAP and Unifier Construction Contract Management are new to BC Hydro, leading to unclear business needs[2]	BC Hydro will monitor this risk and potentially reduce the scope of the Unifier Construction Contract Management interface if the risk of successful deployment is determined to be too great. Also, BC Hydro will utilize existing and well supported interface technologies.	Planned	Medium probability, low impact.	Analysis completed during Design Stage determined that this interface is not required and it has been removed from scope. Some residual risk remains that the interface will be reintroduced based on Site C specific requirements. Specific reserve amount included in estimate.	Monitoring	Low probability: Impact estimated at $0.3 million.

1.19.9 In the event that the SAP to Unifier interface is required for the Site C project, please discuss the possible risks to the project.

RESPONSE:

If it is determined that the SAP to Unifier interface is required for the Site C Project, this would result in a slight increase in project delivery risk for the SCA Project. The risk is now considered minor given that the parameters of such an interface are better understood as compared to when the risk item No. 4 in the preamble above was identified during the development of the Phase One Application. Interfaces always introduce some delivery risk given that integrating disparate systems is one of the more complex components of any technology project.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

Phase One Application, Exhibit B-4, CEC IR 1.32.1;

Implementation Phase Work

On pages 4-11 to 4-12 of the Application, BC Hydro provides descriptions of the major activities to be completed during the Implementation Phase. BC Hydro states:

2. Development of the detailed design, including functional and technical specification documents, writing of custom program code, and testing that the code executes correctly. A portion of the writing of custom program code is currently planned to be undertaken offshore. If this approach proves to be infeasible, incremental funding has been estimated and is included the Authorized Cost estimate for the SCA Project. An amount has been included in the project reserve covering known risks and is described in Table 2-3 and section 2.3.2;

On page 2-13 of the Application, BC Hydro states:

As discussed in the Phase One proceeding, BC Hydro plans to have a portion of the development work done offshore. The advantages of this model include lower cost and 24-hour development cycle due to having resources in another time zone. The Implementation Phase risk that the offshore development model proves to be infeasible, although substantially mitigated through activities undertaken in the Design Stage, is still outstanding as shown in Table 2-4. The amount reserved to mitigate it remains the same as in the Phase One Application.

BC Hydro provides Table 2-5 which indicates that a Project Reserve of $1.0 million is in place in the event that the offshore development model proves to be infeasible.

Table 2-5 Project Reserve Component for Known Risks ($ million)

#	Components addressing the following known risk items	Amount
1	Offshore development model proves to be infeasible	1.0
2	Unifier to SAP interface may be required to support specific Site C processes	0.3
P	**Total Implementation Phase Known Risk Reserve**	**1.3**

In response to Commercial Energy Consumers Association of British Columbia's (CEC) information request (IR) 1.32.1[1], BC Hydro provided a detailed explanation of the offshore development model risk:

BC Hydro considers the following risks to be possible with the proposed offshore development model:

- Privacy restrictions under the Freedom of Information and Protection of Privacy Act (FOIPPA) and significant overhead to address FOIPPA requirements;
- Issues with quality of deliverables;
- Improperly interpreted requirements and design due to little or no ability to ask clarifying questions;
- Potential for communication issues. Remote delivery does not facilitate discussion and early identification of issues and defects;
- Poor coordination of individual development streams resulting in additional effort to integrate the developed code into BC Hydro environment;
- Lack of transparency and visibility into development progress and the resulting potential issues; and
- Model may require BC Hydro team members to travel overseas for an extended duration, with the associated costs and the need to backfill critical team members.

On page 9 of Appendix K-3, KPMG states:

BC Hydro is internally evaluating the potential for offshore delivery. BC Hydro should evaluate the risks posed with an offshore delivery model which include resource capabilities, availability and ability to deliver required deliverables within the project timeframe

On page 21 of Appendix L-2, BC Hydro states:

BC Hydro is working with the SI to assess the requirements and delivery model to support offshore development (including the risk items identified by KPMG). It is anticipated that a recommendation will be brought to the Steering Committee in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.1 Please provide details of the activities undertaken in the Design Stage to substantially mitigate the risks associated with the offshore development model. In your response, please comment on the risks identified in response to CEC IR 1.32.1, risk items identified by KPMG and any additional risks identified by BC Hydro.

[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

RESPONSE:

A number of activities were undertaken in the Design Stage to mitigate the risks associated with the partial offshore development model, including:

- **The preparation of a specific Privacy Impact Assessment (PIA) to ensure that the model would not expose any private data to the offshore development team;**

- **The completion of a cyber-security assessment by BC Hydro's cyber-security team;**

- **The design of the technical environments required to provide the offshore development team with secure access to BC Hydro's systems;**

- **The development of the project processes and procedures to manage the offshore development and ensure quality outputs; and**

- **A review of the System Integrator's (SI) standard operating procedures for managing offshore development to confirm they adequately address the identified risks.**

Further discussion on how these elements relate to the specific risk items identified is provided in the following table:

Reference	Risk	Response
CEC IR 1.32.1	**Privacy restrictions under the Freedom of Information and Protection of Privacy Act (FOIPPA) and significant overhead to address FOIPPA requirements**	• **A specific PIA was developed and approved for offshore development;** • **Offshore developers are restricted to a development region that has scrambled data and all interfaces reviewed to prevent private data being added via interfaces. All developers (onshore and offshore) that access this environment have had refreshers of BC Hydro's standard data privacy policies to ensure that onshore developers do not manually introduce private data into that development environment;** • **Offshore developers access this development environment through a secured channel with additional controls as recommended in our cybersecurity assessment; and** • **SI reviewed their security and privacy obligations and policies as described in the MSA between BC Hydro and PwC, as well as their offshore delivery center controls and their offshore Development Work Practices with BC Hydro.**
	Issue with quality of deliverables	**BC Hydro met with the SI to review their established off shore development practices. There are multiple levels of quality checks built into the SI's development process:** • **All offshore deliverables are peer reviewed to ensure adherence to basic quality standards;** • **Complicated development pieces are reviewed by senior offshore team members;** • **Offshore deliverables are also reviewed by the onsite team to ensure that high quality standards are maintained; and** • **The PwC Technical Lead is informed of the status of all quality checks and is responsible for identifying patterns related to quality.**

Reference	Risk	Response
	Improperly interpreted requirements and design due to little or no ability to ask clarifying questions	**Functional specifications are created and completed by onsite resources. Offshore resources are empowered and encouraged to clarify requirements, challenge functional specs and have a constant dialog with their onsite counterparts and the process teams.** **Requirements and changes are managed as follows:** • **Requirement changes must be approved by change control;** • **Functional specifications are updated by the onshore functional / process team; and** • **Development work and assignments are managed and controlled by the onshore team.**
	Potential for communication issues. Remote delivery does not facilitate discussion and early identification of issues and defects;	**The SI process for managing offshore work and resources involves several points of communication.** • **The onshore and offshore teams operate in an integrated and collaborative manner;** • **Information sharing around project deliverables / content is carried out using a combination of secure email exchanges and common project documentation repositories; and** • **Daily status meetings and ad hoc meetings are scheduled between the onshore and offshore teams.**

Reference	Risk	Response
	Poor coordination of individual development streams resulting in additional effort to integrate the developed code into BC Hydro environment	**The SI process and approach is to have onshore and offshore developers work in the same technical environment, thereby eliminating this risk.**
	Lack of transparency and visibility into development progress and the resulting potential issues	**SI offshore process has SI offshore resources working closely with the SI onshore technical lead. Progress visibility for offshore work uses the same tracking and project management mechanisms as onshore work.**
	Model may require BC Hydro team members to travel overseas for an extended duration, with the associated costs and need to backfill critical team members.	**SI offshore model has offshore resources working closely with SI onshore technical lead and onshore SI functional analysts. It is unlikely for travel to be required but if it were, it would likely be SI onshore resources.**
Appendix K-3 KPMG	**BC Hydro is internally evaluating the potential for offshore delivery. BC Hydro should evaluate the risks posed with an offshore delivery model which include resource capabilities, availability and ability to deliver required deliverables within the project timeframe.**	**BC Hydro evaluated offshore delivery for a specific area of development (SAP ABAP technical programming) with extensive discussions with the SI on how its established onshore / offshore practices mitigate risks of using a partial offshore development model.**

Reference	Risk	Response
Appendix L-2 BC Hydro	**BC Hydro is working with the SI to assess the requirements and delivery model to support offshore development (including the risk items identified by KPMG). It is anticipated that a recommendation will be brought to the Steering Committee in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.**	• **An update on the development of the recommendation was presented to the SCA Project Steering Committee on March 16, 2018;** • **A recommendation to proceed with partial offshore delivery (SAP ABAP technical programming) was approved by the Steering Committee on April 20, 2018, subject to approval of the final offshore Privacy Impact Assessment by the BC Hydro Privacy Office; and** • **The offshore Privacy Impact Assessment approval was received on June 7, 2018.**

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

Phase One Application, Exhibit B-4, CEC IR 1.32.1;

Implementation Phase Work

On pages 4-11 to 4-12 of the Application, BC Hydro provides descriptions of the major activities to be completed during the Implementation Phase. BC Hydro states:

2. Development of the detailed design, including functional and technical specification documents, writing of custom program code, and testing that the code executes correctly. A portion of the writing of custom program code is currently planned to be undertaken offshore. If this approach proves to be infeasible, incremental funding has been estimated and is included the Authorized Cost estimate for the SCA Project. An amount has been included in the project reserve covering known risks and is described in Table 2-3 and section 2.3.2;

On page 2-13 of the Application, BC Hydro states:

As discussed in the Phase One proceeding, BC Hydro plans to have a portion of the development work done offshore. The advantages of this model include lower cost and 24-hour development cycle due to having resources in another time zone. The Implementation Phase risk that the offshore development model proves to be infeasible, although substantially mitigated through activities undertaken in the Design Stage, is still outstanding as shown in Table 2-4. The amount reserved to mitigate it remains the same as in the Phase One Application.

BC Hydro provides Table 2-5 which indicates that a Project Reserve of $1.0 million is in place in the event that the offshore development model proves to be infeasible.

Table 2-5 Project Reserve Component for Known Risks ($ million)

#	Components addressing the following known risk items	Amount
1	Offshore development model proves to be infeasible	1.0
2	Unifier to SAP interface may be required to support specific Site C processes	0.3
P	**Total Implementation Phase Known Risk Reserve**	**1.3**

In response to Commercial Energy Consumers Association of British Columbia's (CEC) information request (IR) 1.32.1[1], BC Hydro provided a detailed explanation of the offshore development model risk:

BC Hydro considers the following risks to be possible with the proposed offshore development model:

- Privacy restrictions under the Freedom of Information and Protection of Privacy Act (FOIPPA) and significant overhead to address FOIPPA requirements;
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- Lack of transparency and visibility into development progress and the resulting potential issues; and
- Model may require BC Hydro team members to travel overseas for an extended duration, with the associated costs and the need to backfill critical team members.

On page 9 of Appendix K-3, KPMG states:

BC Hydro is internally evaluating the potential for offshore delivery. BC Hydro should evaluate the risks posed with an offshore delivery model which include resource capabilities, availability and ability to deliver required deliverables within the project timeframe

On page 21 of Appendix L-2, BC Hydro states:

BC Hydro is working with the SI to assess the requirements and delivery model to support offshore development (including the risk items identified by KPMG). It is anticipated that a recommendation will be brought to the Steering Committee in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.2 Please explain how the $1.0 million reserve component for the offshore development was determined and provide a breakdown of the amount according to work activity.

[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

RESPONSE:

The $1 million reserve component for the offshore development was determined by requesting that the System Integrator include two pricing models with their best-and-final-offer submissions - one for their proposed offshore development model, and one for a full onshore development model - and comparing the difference between the two prices.

BC Hydro does not have the System Integrator's pricing information broken down by work activity.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

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On page 21 of Appendix L-2, BC Hydro states:

BC Hydro is working with the SI to assess the requirements and delivery model to support offshore development (including the risk items identified by KPMG). It is anticipated that a recommendation will be brought to the Steering Committee in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.2.1 Please confirm whether BC Hydro reviewed the appropriateness of the reserve amount as part of the Design and Implementation Planning Stage.

[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

RESPONSE:

While considered, BC Hydro did not revisit the reserve amount in detail attributable to the risk that the offshore development would prove to be infeasible or ineffective in the Design and Implementation Planning Stage.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

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BC Hydro provides Table 2-5 which indicates that a Project Reserve of $1.0 million is in place in the event that the offshore development model proves to be infeasible.

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[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.2.1 Please confirm whether BC Hydro reviewed the appropriateness of the reserve amount as part of the Design and Implementation Planning Stage.

1.20.2.1.1 If yes, please provide details of the review undertaken and explain why the reserve amount is the same as in the Phase One Application ($1.0 million) despite activities undertaken in the Design Phase.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.20.2.1.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

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BC Hydro provides Table 2-5 which indicates that a Project Reserve of $1.0 million is in place in the event that the offshore development model proves to be infeasible.

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[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.2.1 Please confirm whether BC Hydro reviewed the appropriateness of the reserve amount as part of the Design and Implementation Planning Stage.

1.20.2.1.2 If not, please explain why not.

RESPONSE:

While considered, BC Hydro did not revisit in detail the reserve amount in detail attributable to the risk that the offshore development would prove to be infeasible or ineffective as the method used in the Phase One Application was determined to be sufficient.

Given the work done in the design stage of the project to mitigate the risk of the offshore development model being impractical or ineffective, it was determined that a partial offshore development model would be utilized by the SCA Project. Please refer to BC Hydro's response to BCUC IR 1.20.1 for further discussion.

Even if the development model later proves to be ineffective, it would most likely only do so for a sub-set of the development work, not the entirety of the planned offshore development work. As a result, BC Hydro could not establish a method for determining what portion of the work would likely be brought back onshore, nor how much would reasonably be expected to be covered within the scope of the System Integrator's fixed price contract.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

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BC Hydro provides Table 2-5 which indicates that a Project Reserve of $1.0 million is in place in the event that the offshore development model proves to be infeasible.

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1.20.3 Please explain whether a contingency or reserve has been included in the project schedule in the event that the offshore development model proves to not be feasible.

[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

RESPONSE:

No specific contingency or reserve has been included in the project schedule in the event that the planned partial offshore development model proves to be infeasible. While there could be an impact to project schedule if an additional portion of the development work is performed onshore, BC Hydro expects this can be absorbed within the SCA Project's general schedule contingency.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

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BC Hydro is working with the SI to assess the requirements and delivery model to support offshore development (including the risk items identified by KPMG). It is anticipated that a recommendation will be brought to the Steering Committee in March for approval. While offshore development does include certain risks, it also has several advantages that reduce other risks.

1.20.4 Please discuss the factors that would lead to BC Hydro considering the offshore development model as not feasible.

[1] Phase One Application, Exhibit B-4, CEC IR 1.32.1

RESPONSE:

BC Hydro would consider the partial offshore development model to be infeasible if it is found that the model produces poor quality outputs. Offshore development work is currently underway, and no quality issues have been identified to date. The processes and procedures put in place to mitigate the risk of poor quality offshore development work are proving effective thus far.

The other factors that would previously have been considered, such as potential technical issues with secure access, cybersecurity risks, and protection of private data have been addressed through the work completed during the Design Stage. Please refer to BC Hydro's response to BCUC IR 1.20.1 for further discussion.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

Phase One Application, Exhibit B-4, CEC IR 1.32.1;

Implementation Phase Work

On page 5-8, Item 7 in Table 5-1 discusses the risk relating to the proposed offshore development model:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
7	Project Delivery	Active, Updated	Proposed offshore development model is determined to be impractical or ineffective. As discussed in section 2.3.2.1, the benefits of offshore development include, but not limited to, lower cost and a 24-hour development cycle due to having resources in another time zone.	Decision point in Definition Phase to determine if privacy concerns relating to data access adequately met.	Future	Medium probability; impact estimated at $1 million.	Decision made during Definition Phase to proceed with partial offshore development model based on review of Security Privacy and PwC work procedures.	Completed	Low probability; impact estimated at $1 million.
				Development of detailed work procedures to mitigate quality risks associated with offshore development	Future		Initial review of PwC procedures completed during Definiition Phase assessment. Detailed procedures to be finalized in early Realization Stage.	In progress	
				Incremental funding included in Project Reserve.	Completed		Some residual risk remains that off-shore development will prove to be ineffective or produce low quality outputs. Reserve of $1 million included in Implementation Phase estimate to cover cost of completing additional development on-shore.	Monitoring	

1.20.5 Please explain what is meant by “partial offshore development model”. In your response, please discuss any changes made to the development model since the Phase One Application.

RESPONSE:

No changes have occurred to the development delivery model since the Phase One Application. The use of the term ‘partial offshore development’ was introduced during the Design Stage in order to more accurately describe the development options under consideration. Prior to this, including in the Phase One Application, BC Hydro used the terms ‘onshore’ and ‘offshore’ when referring to the general development model options. However, the term was changed

during the Design Stage to clarify that it did not mean all development would be done offshore. The development model originally proposed by PwC had always included a combination of both offshore and onshore development (i.e., partial offshore development model).

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

Phase One Application, Exhibit B-4, CEC IR 1.32.1;

Implementation Phase Work

On page 5-8, Item 7 in Table 5-1 discusses the risk relating to the proposed offshore development model:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
7	Project Delivery	Active, Updated	Proposed offshore development model is determined to be impractical or ineffective. As discussed in section 2.3.2.1, the benefits of offshore development include, but not limited to, lower cost and a 24-hour development cycle due to having resources in another time zone.	Decision point in Definition Phase to determine if privacy concerns relating to data access adequately met.	Future	Medium probability; impact estimated at $1 million.	Decision made during Definition Phase to proceed with partial offshore development model based on review of Security Privacy and PwC work procedures.	Completed	Low probability; impact estimated at $1 million.
				Development of detailed work procedures to mitigate quality risks associated with offshore development	Future		Initial review of PwC procedures completed during Definiition Phase assessment. Detailed procedures to be finalized in early Realization Stage.	In progress	
				Incremental funding included in Project Reserve.	Completed		Some residual risk remains that off-shore development will prove to be ineffective or produce low quality outputs. Reserve of $1 million included in Implementation Phase estimate to cover cost of completing additional development on-shore.	Monitoring	

1.20.6 Please explain what aspects of the model will be developed onshore and which will be developed offshore.

RESPONSE:

The scope of the supply chain applications solution includes 252 custom items to be developed, representing roughly 37,000 hours of development time. It is currently estimated that 40 per cent of the development work will be completed offshore. In general, simpler development work will be performed primarily offshore, including items written in ABAP - the proprietary development language that the SAP ECC system is written in. More complex items, particularly those that require a high degree of feedback from BC Hydro users of the system - such as user interface and mobile application developments - will be developed primarily onshore.

20.0 D. PROJECT SCOPE AND ACTIVITIES

Reference: IMPLEMENTATION PHASE WORK
Exhibit B-1, Section 2.3.2.1, p. 2-13; Section 4.4, p. 4-11 to 4-12; Section 5.3, pp. 5-3 to 5-13; Appendix K-3, p. 9; Appendix L-2, p. 21;

Phase One Application, Exhibit B-4, CEC IR 1.32.1;

Implementation Phase Work

On page 5-8, Item 7 in Table 5-1 discusses the risk relating to the proposed offshore development model:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
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				Development of detailed work procedures to mitigate quality risks associated with offshore development	Future		Initial review of PwC procedures completed during Definiition Phase assessment. Detailed procedures to be finalized in early Realization Stage.	In progress	
				Incremental funding included in Project Reserve.	Completed		Some residual risk remains that off-shore development will prove to be ineffective or produce low quality outputs. Reserve of $1 million included in Implementation Phase estimate to cover cost of completing additional development on-shore.	Monitoring	

1.20.7 Please discuss what impacts, if any, the “partial offshore” model would have on the estimated risk impact of $1 million.

RESPONSE:

There is no impact of the ‘partial offshore’ model. For clarity, the use of the term ‘partial’ was introduced to clarify the scope of the offshore development model. The proposed development model has not changed from the one discussed in the Phase One Application. Please also refer to BC Hydro’s response to BCUC IR 1.20.5.

21.0 E. PROJECT RISK

Reference: IMPLEMENTATION PHASE ASSESSMENT OF RISKS AND RISK MITIGATION
Exhibit B-1, Section 5.3, pp. 5-3 to 5-13;
Implementation Phase Work

On page 5-3 of the Application, BC Hydro states that one new risk has been identified during the Definition Phase. BC Hydro explains:

The only newly identified risk is the potential for low data quality and/or data not being ready according to the Project Schedule. The main type of data relevant to this risk is information on BC Hydro's contracts. If this risk materializes, it would not impact project costs, but could result in increased operating cost pressures as BC Hydro works to increase the data quality and availability; any impact to the project schedule due to this risk would be addressed through the project schedule contingency.

1.21.1 Please explain why, in the event that the above risk were to materialize, there would be no impact on cost.

RESPONSE:

In the event the risk were to materialize, there would be no impact on the SCA Project's cost because, as per BC Hydro's standard, the work associated with the creation or cleansing of data would be borne by the business group responsible for the data. This is why BC Hydro states in the Verification Report that the risk '…could result in increased operating cost pressure…' was included in the explanation.

21.0 E. PROJECT RISK

Reference: IMPLEMENTATION PHASE ASSESSMENT OF RISKS AND RISK MITIGATION
Exhibit B-1, Section 5.3, pp. 5-3 to 5-13;
Implementation Phase Work

On page 5-3 of the Application, BC Hydro states that one new risk has been identified during the Definition Phase. BC Hydro explains:

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1.21.2 In the event that the above risk was to materialize, please discuss the anticipated impact on the project schedule. Please comment on whether the project schedule contingency would be sufficient to address this risk.

RESPONSE:

If the risk materializes, it could have a minor impact on the SCA Project's schedule, BC Hydro expects that the existing schedule contingency is sufficient to address the risk.

The impact on the schedule would be minor because the SCA Project can be placed into service without the data referenced in this risk being fully converted and further data clean-up could be done post go-live.

Please also refer to BC Hydro's response to CEC IR 1.32.2 for a discussion of why the risk is not expected to impact the time to deliver the project benefits.

21.0 E. PROJECT RISK

Reference: IMPLEMENTATION PHASE ASSESSMENT OF RISKS AND RISK MITIGATION
Exhibit B-1, Section 5.3, pp. 5-3 to 5-13;
Implementation Phase Work

On page 5-4, BC Hydro provides Table 5-1 titled Implementation Phase – Risks and Risk Mitigation Summary. Item 15 in the table refers to the newly identified risk:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
14	Project Delivery	Active, Updated	Poor quality of delivery by SI	Comprehensive procurement exercise to select qualified vendors	Complete	Medium probability, high impact			Medium probability, high impact
				Establish a strong contract with incentives for good quality delivery	In Progress		Strong Master Services Agreement established.	Complete	
				Strong Project and Contract Management	In Progress		Contract management, project management, and quality management procedures being updated to reflect lessons learned from work completed to date on the project.	In Progress	
				Robust Quality Management Plan	In Progress		See above	In Progress	
15	Project Delivery	New	Low data quality and or data not being ready according to Project Schedule				Continue detailed assessment and planning of data conversion requirements in early Realization	In Progress	Medium Probability, medium impact
							Alignment of the data conversion tasks with business transition and resource plans	Planned	

1.21.3 Please provide further information on the proposed mitigation strategy for Item 15.

RESPONSE:

Since the start of Implementation, BC Hydro has completed a more detailed data conversion planning exercise to mitigate this risk. As a result of this work, the probability of the risk occurring has been reduced from medium to low. The impact of the risk remains medium.

The data conversion planning exercise included the development of a data preparation list that documents the data cleansing and data capture activities required to address areas of low data quality. The data preparation list includes:

- **Description of the required data cleansing or creation activity;**
- **Accountable and responsible parties;**
- **Priority;**
- **Detailed plan including dates;**
- **Known constraints; and**
- **Testing and timing requirements (completion requirements for integration test cycles one and two, user acceptance testing, and solution go-live).**

SCA Project's data conversion team will report to the Project Director monthly on the progress against the plan, and adjust as necessary to any issues that arise in its execution.

21.0 E. PROJECT RISK

Reference: IMPLEMENTATION PHASE ASSESSMENT OF RISKS AND RISK MITIGATION
Exhibit B-1, Section 5.3, pp. 5-3 to 5-13;
Implementation Phase Work

On page 5-7, Item 6 in Table 5-1 discusses the risk relating to the regulatory process:

No.	Risk Category	Risk Status	Risk Event / Threats	Phase One Application			Verification Report		
				Mitigation Plans	Mitigation Status	Probability and Impact	Updated Mitigation Plans & Mitigation Assessment	Mitigation Status	Probability and Impact
5	Project Delivery	Inactive	Adverse or Delayed British Columbia Utilities Commission Order	Comprehensive Application; propose a schedule that facilitates a decision by August 2017. Incremental funding included in Project Reserve as described in section 2.4.2, Table 2.-4.	In progress Completed	Potential impact will vary depending on date and wording of British Columbia Utilities Commission decision.	N/A Despite a longer decision timeline than planned, no draw on the Project Reserve was necessary.	Completed N/A	Risk has passed
6	Project Delivery	Active, Updated	Requirement to undertake a protracted regulatory process in order to proceed with Implementation phase work	Comprehensive Application; propose a schedule that facilitates a decision by April 2018. Incremental funding included in Project Reserve as described in section 2.4.2, Table 2-4	In progress Completed	Potential impact will vary depending on date and wording of British Columbia Utilities Commission decision.	Board of Directors resolution passed enabling the project to proceed with Implementation Phase activities for up to six months while the regulatory approval process continues in parallel. Some residual risk remains that delay may be required if regulatory process extends beyond six months.	Monitoring	Low probability: High impact

BC Hydro states that the resolution passed by the Board of Directors enables the project to proceed with Implementation Phase activities for up to six months while the regulatory approval process continues in parallel.

By Order G-229-18 dated December 3, 2018, the BCUC established the remaining regulatory timetable for the review of the Application, which includes one round of BCUC and intervener information requests to BC Hydro and written final and reply arguments.

1.21.4 Please discuss BC Hydro's current plans with respect to proceeding with Implementation Phase activities given the regulatory timetable established by Order G-229-18.

RESPONSE:

Per the resolution provided by BC Hydro's Board of Directors on September 27, 2018, BC Hydro is proceeding with Implementation Phase activities in parallel with the completion of the regulatory approval process, up to the incremental increased value of $15 million. The incremental $15 million provides funding for the Project until approximately the end of April 2019. If the regulatory process has not concluded at that time, BC Hydro will seek direction from the Board of Directors as to whether the project should progress.

21.0 E. PROJECT RISK

Reference: IMPLEMENTATION PHASE ASSESSMENT OF RISKS AND RISK MITIGATION
Exhibit B-1, Section 5.3, pp. 5-3 to 5-13;
Implementation Phase Work

On page 5-7, Item 6 in Table 5-1 discusses the risk relating to the regulatory process:

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6	Project Delivery	Active, Updated	Requirement to undertake a protracted regulatory process in order to proceed with Implementation phase work	Comprehensive Application; propose a schedule that facilitates a decision by April 2018. Incremental funding included in Project Reserve as described in section 2.4.2, Table 2-4	In progress Completed	Potential impact will vary depending on date and wording of British Columbia Utilities Commission decision.	Board of Directors resolution passed enabling the project to proceed with Implementation Phase activities for up to six months while the regulatory approval process continues in parallel. Some residual risk remains that delay may be required if regulatory process extends beyond six months.	Monitoring	Low probability: High impact

BC Hydro states that the resolution passed by the Board of Directors enables the project to proceed with Implementation Phase activities for up to six months while the regulatory approval process continues in parallel.

By Order G-229-18 dated December 3, 2018, the BCUC established the remaining regulatory timetable for the review of the Application, which includes one round of BCUC and intervener information requests to BC Hydro and written final and reply arguments.

1.21.5 Please explain any impacts that the regulatory process and timetable established by Order G-229-18 has on the project. In your response, please comment on the project risks, costs and schedule.

RESPONSE:

As discussed in Item 6 in Table 5-1 of the Verification Report, there is a residual risk that the regulatory process requires more than six months to complete. Were the process to extend beyond the six months, BC Hydro would seek direction from the Board of Directors as to whether work on the project should progress. If the direction were that work on the SCA Project should be paused, the impact would be to increase the project risk, cost, and schedule. The extent of the impact would depend on the additional time required to complete the regulatory process. BC Hydro expects the current schedule set out by the Commission should allow the process to be completed close to the six-month target. As such the potential impact of this residual risk is considered low.

22.0 E. PROJECT RISK

Reference: SEPTEMBER 2018 BOARD BRIEFING MEMO AND CERTIFIED RESOLUTION
Exhibit B-1, Appendix E, p. 5;
Risks

On page 5 of the September 2018 Board Briefing Memo and Certified Resolution (Appendix E), BC Hydro states:

In the Phase One application, the overall risk level for the project was assessed as moderate. Many of the risks identified in the Phase One application have been mitigated through actions taken during the Design Stage.

1.22.1 Please provide the overall risk level for the project at this time. In your response, please explain how the risk level was determined.

RESPONSE:

The overall risk rating for the SCA Project remains moderate. While many risks identified in the Phase One Application have been mitigated, some key business risks remain due to the scale of the SCA Project and the magnitude of the changes being introduced as a result of the new systems and business processes. Specifically, the two business risks listed in Table 5-1 (items 1 and 2) have the same probability and impact ratings as they did in the Phase One Application.

23.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Section 6.3, p. 6-4;
Updated major milestones and key activities

On page 6-4 of the Application, BC Hydro states:

The updated project schedule (**Project Schedule**) has been developed in consideration of the project's preliminary design and updated project activities. The Target In-service Date is based on the planned SCA Project schedule of activities required to bring the technical solution into service. The Committed In-service Date includes a four month schedule contingency, which covers changes to the SCA Project within BC Hydro's control, such as additional time for testing the solution. Changes to the SCA Project that impact the project schedule and are outside of BC Hydro's control have not been reflected in this contingency.

1.23.1 Please provide examples of what changes to the SCA Project would be considered outside of BC Hydro's control.

RESPONSE:

An example of a change outside of BC Hydro's control would be a force majeure event, such as an extreme weather event or natural disaster requiring BC Hydro to divert resources to other priorities and necessitating a delay in the SCA Project.

24.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Section 2.3.1.1, pp. 2-9, Table 2-3; Section 6.3.2, pp. 6-5 to 6-6;
SCA Project schedule changes

On page 6-5 of Chapter of the Application, BC Hydro states:

In the Phase One Application, BC Hydro stated that the planned project completion date was the end of July 2020. As outlined in section 6.3.1, the planned project completion date is now March 2021. The change in the planned project completion date is due to a combination of the longer time to complete the Definition Phase described in section 6.2 above and over two additional months added to the Implementation Phase schedule, for a total of an eight month delay.

1.24.1 Please quantify the cost impacts of the eight month delay to the project completion date. In your response please reference any impacts on the cost variances provided in Table 2-3 and identify whether the cost impacts affect capital or operating.

RESPONSE:

Definition Phase

The cost impact of the additional time required to complete the Definition Phase is $1.2 million. Of the $1.2 million, $1.08 million is capital and $0.16 million is operating. Please refer to BC Hydro's response to BCOAPO IR 1.4.1 for further discussion of the impact of the schedule change on the overall cost of the Definition Phase.

Implementation Phase

It is difficult to attribute specific cost impacts to the addition of the two and a half months to the Implementation Phase schedule. However, BC Hydro estimates that $0.4 million (all capital) of System Integrator costs and $1.0 million of BC Hydro costs ($0.5 million operating and $0.5 million capital) are primarily attributable to the schedule change.

Please refer to BC Hydro's responses to BCUC IRs 1.5.1.1 and 1.5.2 for further discussion, including how these costs impact the variances provided in Table 2-3 of the Verification Report.

24.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Section 2.3.1.1, pp. 2-9, Table 2-3; Section 6.3.2, pp. 6-5 to 6-6;
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1.24.2 Please confirm whether the Phase One schedule included a 4 month contingency period.

RESPONSE:

Confirmed. As discussed in section 4.7 of the Phase One Application, the SCA Project's schedule included a four-month schedule contingency between the Target and Committed in-service dates.

24.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Section 2.3.1.1, pp. 2-9, Table 2-3; Section 6.3.2, pp. 6-5 to 6-6;
SCA Project schedule changes

On page 6-5 of Chapter of the Application, BC Hydro states:

In the Phase One Application, BC Hydro stated that the planned project completion date was the end of July 2020. As outlined in section 6.3.1, the planned project completion date is now March 2021. The change in the planned project completion date is due to a combination of the longer time to complete the Definition Phase described in section 6.2 above and over two additional months added to the Implementation Phase schedule, for a total of an eight month delay.

1.24.2 Please confirm whether the Phase One schedule included a 4 month contingency period.

1.24.2.1 If confirmed, please discuss the purpose of the contingency period.

RESPONSE:

The purpose of the schedule contingency (i.e., managing to a separate Target In-Service Date and Committed In-Service Date) is to mitigate project risk. This is done by managing to the earlier of the two dates (i.e., the Target In-Service Date), while recognizing that some critical path activities may require longer to complete than planned. If additional calendar time is required - either to complete additional work or to adjust for schedule slippage - the SCA Project would request approval from the SCA Project Steering Committee to draw on the schedule contingency, and would adjust the planned in-service date accordingly.

24.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Section 2.3.1.1, pp. 2-9, Table 2-3; Section 6.3.2, pp. 6-5 to 6-6;
SCA Project schedule changes

On page 6-5 of Chapter of the Application, BC Hydro states:

In the Phase One Application, BC Hydro stated that the planned project completion date was the end of July 2020. As outlined in section 6.3.1, the planned project completion date is now March 2021. The change in the planned project completion date is due to a combination of the longer time to complete the Definition Phase described in section 6.2 above and over two additional months added to the Implementation Phase schedule, for a total of an eight month delay.

1.24.2 Please confirm whether the Phase One schedule included a 4 month contingency period.

1.24.2.2 If confirmed, please discuss whether some or all of the 4 month contingency period could have been used to mitigate the impacts of the 8 month delay.

RESPONSE:

As with the project cost estimate and cost-based contingencies, a new project schedule is established at the end of the Definition Phase based on Definition Phase deliverables, including establishing the schedule contingency. Schedule contingencies, like cost based contingencies and reserve, do not carry forward from the Definition Phase to the Implementation Phase. Rather, schedule contingencies are established at the end of the Definition Phase based on the information available at that time. Please also refer to BC Hydro's response to CEC IR 1.6.1 for discussion on the development of cost-based contingencies for the Implementation Phase.

The SCA Project Steering Committee approved two schedule extensions to the Design and Implementation Planning Stage: one to extend the completion date of the stage from June 22, 2018 to August 6, 2018, and a subsequent one to extend it from August 6, 2018 to September 4, 2018. These schedule changes were drawing on the schedule contingency as they impacted the Target in-service date. However, as discussed above, the schedule contingency was re-established at four months during the Implementation Planning portion of the Stage.

25.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Appendix Q, p. 1;
SCA Project – project stages and major milestones

On page 1 of Appendix Q, BC Hydro provides a summary of the project stages and major milestones. November 2019 is stated to be the "End of warranty period (Stabilization)."

1.25.1 Please confirm, or otherwise explain, that the warranty period referenced is in relation to the System Integrator's services.

RESPONSE:

Confirmed. The System Integrator's services include a six-month warranty period from the date any configuration or code is moved into the production environment.

In addition, there is a warranty period specific to the execution of a successful year-end financial process that would come into effect in the event that the six-month warranty period does not span a fiscal year end.

25.0 F. PROJECT SCHEDULE

Reference: PROJECT SCHEDULE
Exhibit B-1, Appendix Q, p. 1;
SCA Project – project stages and major milestones

On page 1 of Appendix Q, BC Hydro provides a summary of the project stages and major milestones. November 2019 is stated to be the "End of warranty period (Stabilization)."

1.25.1 Please confirm, or otherwise explain, that the warranty period referenced is in relation to the System Integrator's services.

1.25.1.1 If not confirmed, please provide the following information:

- The purpose of the warranty;
- The provider of the warranty;
- Any risks to the project beyond the warranty period; and
- Any risks to the warranty period in the event that the project is behind schedule.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.25.1.