



VIA EFILE

April 20, 2017

**BC HYDRO SUPPLY CHAIN  
APPLICATIONS PROJECT EXHIBIT A-7**

Mr. Fred James  
Chief Regulatory Officer  
Regulatory & Rates Group  
British Columbia Hydro and Power Authority  
16<sup>th</sup> Floor – 333 Dunsmuir Street  
Vancouver, BC V6B 5R3

Dear Mr. James:

Re: British Columbia Hydro and Power Authority  
Supply Chain Applications Project Application

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Further to your December 21, 2016 filing of the above noted application, enclosed please find the Commission's Information Request No. 2. In accordance with the regulatory timetable set out in Order G-53-17, please file your responses electronically with the Commission on or before Friday, May 12, 2017.

Yours truly,

*Original signed by:*

Patrick Wruck

JR/dg  
Enclosure

**British Columbia Hydro and Power Authority  
Supply Chain Applications Project Application**

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**A. PROJECT JUSTIFICATION**

- 33.0 **Reference:** **BENEFITS ANALYSIS**  
**Exhibit B-4, CEC IR 33.1; BC Hydro F2017-F2019 Revenue Requirements Application proceeding (F2017-F2019 RRA), Exhibit B-9, BCUC IR 64.1, Attachment 1, pp. 8–9;**  
**Exhibit B-3, BCUC IR 2.1**  
**Capital Investment Analysis Guide**

In response to CEC Information Request (IR) 33.1, British Columbia Hydro and Power Authority (BC Hydro) stated it will seek to “achieve 100 per cent of the benefits. However, to be conservative, BC Hydro selected 50 per cent as the potential for monetized benefits to be achieved... The upper ceiling of 60 per cent and lower floor of 30 per cent were similarly selected to be conservative. With this approach, the upper ceiling is assumed to be a 10 per cent increase from the midpoint, whereas the lower floor represents a reduction of twice that amount.”

As part of its response to BCUC IR 64.1 in the F2017-F2019 RRA proceeding, BC Hydro provided an enterprise-wide “Capital Investment Analysis Guide” (Guide) on which the Technology PMO is listed as one of the document owners.

On pages 8-9 of the Guide, BC Hydro stated that “economic benefit(s) provided by a project will be characterized as ‘hard’ or ‘soft’ depending on the level of certainty associated with achieving the benefits and whether it directly impacts BC Hydro’s costs and/or revenues.” Hard benefits are included in NPV calculations at 100%, and soft benefits are included in NPV calculations at “no more than 25% of their estimated value.” Footnote 2 states that a sensitivity analysis of value based projects at various levels of discounted soft benefits was completed and 25% was considered to be a reasonable figure, reflecting the importance of various soft benefits balanced against their uncertainty and difficulty in measurement and validation.

- 33.1 Please attach BC Hydro’s Capital Investment Analysis Guide – 2015 and Capital Allocation Risk Matrix.
- 33.2 Please confirm that all the economic benefits of the Supply Chain Applications Project (SCA Project) are properly characterized as “soft” as per the Capital Investment Analysis Guide. If not, please explain.
- 33.3 Has the analysis methodology contained in BC Hydro’s Capital Investment Analysis Guide – 2015, been applied to the SCA Project? If not, please explain why not.
- 33.4 What is BC Hydro’s estimate of the probability of achieving each of the 30, 50 and 60 percent levels of the benefits in the aggregate?
- 33.5 Please explain why BC Hydro determined that a soft benefit inclusion rate of 50 percent was appropriate for the SCA Project given that BC Hydro’s Capital Investment Analysis Guide – 2015, states that soft benefits should be included at no more than 25 percent. Please compare the data and analysis that was used in determining the soft benefit inclusion rate in the Capital Investment Analysis Guide (25%) to the SCA Project (50%).

33.6 Please provide an overview of the process that was followed to prioritize the SCA Project with other capital projects. What was the inclusion level of soft benefits applied to other capital projects? Explain why these inclusion levels were chosen making note of the uncertainty and difficulty in measurement and validation of the soft benefits of the applicable capital projects.

In response to BCUC IR 2.1, BC Hydro provided a risk assessment that does not follow the format of the Capital Allocation Risk Matrix and states that the project’s ability to mitigate risks is an important and relevant part of its justification.

33.7 Please redo the risk assessment provided in response to BCUC IR 2.1 applying the BC Hydro Capital Allocation Risk Matrix following the methodology contained in BC Hydro’s Capital Investment Analysis Guide – 2015 using professional judgement in determining the likelihood and consequence ratings. If BC Hydro is not able to complete this assessment, please explain why mitigation of “these risks is an important and relevant part of the project’s justification” if BC Hydro does not have enough information to make professional judgement based estimates of the severity and likelihood of the risks in accordance with BC Hydro’s Capital Investment Analysis Guide.

34.0 **Reference: BENEFITS ANALYSIS**  
**Exhibit B-1 (Application), Attachment F, Tab F1; Exhibit B-4, CEC IR 11.4**  
**Downstream contract management**

The following table prepared by Commission staff has been filtered from Attachment F, Tab F1.

ID	Potential Benefit	Calculation Logic	Potential Benefit Mid
7	Reduction of effort in operations managing completion of work.	Approximately 4,000 people work in PassPort performing supply 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.	3902

In response to CEC IR 11.2 BC Hydro stated:

The “inefficient time” relates to the effort within the business to manage contracts effectively as noted in Appendix F, Tab F1, Cell E9 (i.e., the use of spreadsheets and other systems to track, approve and report work). BC Hydro’s goal is to eliminate as much as possible of this “inefficient time” through implementation of the SAP supply chain system.

34.1 Please confirm that BC Hydro believes it is possible to illuminate 100 percent the “inefficient time” through implementation of the SAP supply chain system. If not confirmed, what percent of the “inefficient time” is it possible to eliminate?

35.0 **Reference: BENEFITS ANALYSIS**  
**Exhibit B-1, Appendix F, Tab F1; Attachment P, p. 56**  
**Reduction in inventory**

The following table prepared by Commission staff has been filtered from Appendix F, Tab F1.

ID	Potential Benefit	Calculation Logic	Potential Benefit Mid
14	Reduction of cost of capital through an increase in inventory turns.	Calculation financial benefit resulting from an increase in the inventory turn ratio is calculated differently than other benefits in this list. 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 could be increased to between 2 and 2.5 which would result in a savings of \$1.2 to \$2.4 million a year through lower carrying costs.	1772

On Page 56 of Attachment P, the utilities industry average turns ratio for Transmission and Distribution is quoted from Scott Madden 2011 as being 2.41 compared to BC Hydro’s ratio of 1.51.

- 35.1 How much of the stock materials are used by Transmission and Distribution vs Generation? What is the industry average inventory turns ratio for Hydro Generation?
- 35.2 Please explain why BC Hydro believes an inventory turn ratio of 2.5 is achievable and desirable. Is a turn ratio of 2.5 considered to be 100 percent level of achievable benefits? Would an inventory turn ratio above the current 1.6 result in reduced spares inventory? How will BC Hydro ensure system reliability is maintained at a turn ratio above the current 1.6?
- 35.3 Please provide a breakdown of the \$5.6 million in inventory carrying costs. Please explain in detail how the reduction in inventory benefit would be monetized given that the same number of items would need to be processed (stored and retrieved). Would BC Hydro reduce its warehouse space? If yes, please explain the method and timing of the reduction.
- 35.4 It appears that the inventory turns mid benefit corresponds to a 75 percent benefit realization. Please explain the calculations of the low, mid and high benefit estimates. What turn ratio and percent of benefit realization do the benefit estimates correspond to? Please provide justification for any variance from the benefit realization levels applied to other benefits

36.0 **Reference: BENEFITS ANALYSIS  
Exhibit B-1, Appendix F, Tab F1  
Stock materials cost**

The following table prepared by Commission staff has been filtered from Appendix F, Tab F1.

ID	Potential Benefit	Calculation Logic	Potential Benefit Mid
60	Reduction of cost of materials by reducing premiums paid for spot buy activity.	BC Hydro spends approximately \$200 million a year on stock materials. It is estimated that approximately 30% of MRs result in an expedited purchase, and this creates a 15% increase in cost.	4500

- 36.1 Can the opportunity to reduce “spot buy activity” be characterized as improved or increased category management of stock materials? Please differentiate this opportunity from a reduction in expedited purchases which presumably involve expeditors and higher shipping costs and would seem to be a different cost opportunity than reducing spot buy activity.
- 36.2 Does the 15 percent increase in cost include both the increase in “spot buy” purchase price and expedited purchasing?
  - 36.2.1 If not, is the implementation of the SCA Project expected to reduce expedited shipping costs and where is this benefit captured?
  - 36.2.2 If yes, approximately how much of the 15 percent increase in cost is associated with expedited shipping?
  - 36.2.3 If yes, does BC Hydro currently track expediting costs separately? If not, why not? If yes, please provide historical expediting costs backing up the estimate.

36.2.4 Does BC Hydro consider it industry best practice to track expediting costs separately? If not, why not? Will BC Hydro track expediting cost after the SCA Project has been implemented?

**37.0 Reference: BENEFITS ANALYSIS  
Exhibit B-1, Appendix F, Tab F1; Exhibit B-3, BCUC IR 4.2.2  
Innovative procurement**

In response to BCUC IR 4.2.2, BC Hydro stated “Innovative procurement approaches will not reduce the future benefits of the Supply Chain Applications Project.”

The following table prepared by Commission staff has been filtered from Appendix F, Tab F1 and includes Potential Benefits with a mid-benefit of \$2 million or greater.

ID	Potential Benefit	Calculation Logic	Potential Benefit Mid
5	Reduction in cost of non-stock materials and services through category management.	The baseline is the total 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.	5750
7	Reduction of effort in operations managing completion of work.	Approximately 4,000 people work in PassPort performing supply 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.	3902
26	Reduction of effort in operations and projects approving invoices.	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.	5756
60	Reduction of cost of materials by reducing premiums paid for spot buy activity.	BC Hydro spends approximately \$200 million a year on stock materials. It is estimated that approximately 30% of MRs result in an expedited purchase, and this creates a 15% increase in cost.	4500

37.1 What percentage of the \$2.5 billion materials and services that flow through the supply chain are contracted through innovative procurement approaches such as Design-Build and Public-Private Partnerships? Is this expected to change in the future? If yes, what is the percentage expected to be in the future?

37.2 Please explain how for a large project contracted under a competitive innovative procurement approach (such as the John Hart Generating Station Replacement project) that the SCA Project would allow for:

- a) a 0.5 percent reduction in cost through category management;
- b) an equal opportunity to reduce contract completion work as compared to traditional contracting? Please discuss the relative number of contracts BC Hydro would process under innovative procurement vs traditional contracting;
- c) an equal opportunity to reduce effort on invoice approval as compared to traditional contracting? Please discuss the relative number of invoices BC Hydro would process under innovative procurement vs traditional contracting; and
- d) an equal opportunity to reduce cost of materials by reducing premiums paid for spot buy activity as compared to traditional contracting? Please discuss the relative amount of materials BC Hydro would process under innovative procurement vs traditional contracting.

38.0 **Reference: BENEFITS ANALYSIS**  
**Exhibit B-3, BCUC IR 20.2; BC Hydro F2017-F2019 Revenue Requirements Application**  
**proceeding (F2017-F2019 RRA), Exhibit B-9, BCUC IR 154.5**  
**Weighted cost of debt**

BC Hydro provided the following table in response to BCUC IR 154.5 in the F2017-F2019 RRA proceeding which shows the calculation of BC Hydro’s forecast weighted average cost of debt for F2017 to F2019.

	\$ million	Reference Appendix A	F2017 Plan	F2018 Plan	F2019 Plan
	<b>Net Debt</b>				
1	Sinking Funds	Sch 8.0, Line 48	(179.5)	(175.8)	(176.2)
2	Temporary Investments	Sch 8.0, Line 49	(10.0)	(10.0)	(10.0)
3	Long-Term Debt	Sch 8.0, Line 50	16,885.1	18,788.3	19,060.2
4	Short-Term Debt	Sch 8.0, Line 51	2,961.4	2,267.5	2,938.2
5	Subtotal	Sch 8.0, Line 52	19,657.1	20,870.1	21,812.2
6	IDC Adjustments	Sch 8.0, Line 53	144.5	146.3	151.8
7	End of Year	Sch 8.0, Line 54	19,801.6	21,016.4	21,964.0
8	Mid-Year Balance	Sch 8.0, Line 55	18,981.2	20,409.0	21,490.2
	<b>Weighted Average Cost of Debt</b>				
9	Total Gross Finance Charges	Sch 8.0, Line 56	711.4	745.9	785.0
10	IDC Adjustments	Sch 8.0, Line 57	55.9	82.2	102.9
11	Total	Sch 8.0, Line 58	767.3	828.1	887.8
12	Weighted Average Cost of Debt	L11 / L8 Sch 8.0, Line 59	4.04%	4.06%	4.13%

In response to BCUC IR 20.2, BC Hydro provided the assumptions used to calculate weighted cost of debt of 2.88%, 3.58% and 4.47% in F2017, F2018 and F2019, respectively, in this Application.

38.1 Please explain why BC Hydro did not use the same forecast weighted average cost of debt rates in this Application as in the F2017-F2019 RRA.

39.0 **Reference: BENEFITS ANALYSIS**  
**Exhibit B-1, Attachments F and J (Parts 1 to 6)**  
**Project cost and Net Present Value (NPV)**

39.1 If applicable, in consideration of all Commission and intervener information requests to-date and any other resulting changes identified by BC Hydro, please provide revised project cost ranges and NPV analyses (discounted cash flows and revenue requirements impact) for SAP and PassPort. Please summarize the changes and submit all calculations in Excel, highlighting the differences in another font and/or cell colour.

40.0 **Reference: COST ESTIMATE**  
**Exhibit B-3-3, BCUC IR 13.1; Exhibit B-1, Attachment G**  
**SAP mid-range cost estimate**

As part of Confidential Attachment G to the Application, BC Hydro provides pricing information included in PricewaterhouseCoopers’ Best and Final Offer submission for the SCA Project.

In response to BCUC IR 13.1, BC Hydro provided a table showing a breakdown of the SAP mid-range cost estimate by spend area, which included a separate line for “System Integrator” costs.

40.1 Commission staff noted a difference between the total price in Attachment G and the System Integrator's cost in BC Hydro's response to BCUC IR 13.1. Please explain and/or reconcile the difference between the two amounts. Did the System Integrator provide revised pricing information?

41.0 **Reference: COST ESTIMATE  
Exhibit B-3 BCUC IRs 30.8, 30.9; Exhibit B-1, Attachment M  
Master services agreement for Systems Integrator**

In response to BCUC IR 30.8, BC Hydro listed several disincentives.

41.1 Please confirm no incentives for good quality delivery are payable to the Systems Integrator beyond the fixed prices set for the Statements of Work (SOWs).

BC Hydro stated in response to BCUC IR 30.9 that there are a number of risk-allocation provisions in the Master Services Agreement for the Systems Integrator; one of these provision is a Financial "gain sharing" provision which BC Hydro stated "applies to fixed-price statement of work, so that in certain circumstances BC Hydro and the System Integrator will share the savings if the notional calculated fees for the System Integrator's work regarding a fixed-price statement of work are less than the fixed price for the statement of work."

41.2 Please confirm whether any amounts related to a "gain sharing provision" have been incorporated into the SAP supply chain application project cost estimate. If yes, please provide the amount of included savings and explain how these savings were calculated. What is BC Hydro's P50 estimate of the gain sharing value?

In response to BCUC IR 30.9, BC Hydro also stated "The System Integrator's services are subject to a full re-performance warranty for deficiencies identified during a specified warranty period (at least 180 days) starting when all services required for the relevant Work Package are completed... Each technical deliverable (e.g., computer code or configuration) is subject to a repair/replace warranty..."

In Attachment M of the Application, BC Hydro provides a project schedule which shows the anticipated timeline for the project stages and major milestones. Commission staff noted the plan "End of warranty period (stabilization)" is November 2019; whereas, the plan "Close of project" is July 2020.

41.3 Please explain what steps BC Hydro has taken, or will take, to mitigate the risk arising from an onboarding period which is longer than the System Integrator's warranty period (i.e. the risk arising from technical issues with the new platform which are not uncovered until late [December 2019 to July 2020] in the implementation phase).

42.0 **Reference: COST ESTIMATE  
Exhibit B-3, BCUC IR 29.3  
HANA migration**

BC Hydro stated in response to BCUC IR 29.3 that it "has not factored a subsequent HANA migration into the Supply Chain Applications Project and sustainment cost calculations; however a separate financial provision of approximately \$10 million for SAP platform upgrades is included in BC Hydro's Ten Year Capital Forecast."

42.1 Please confirm that the PassPort alternative costing also does not include platform migration costs. Please discuss and to the degree possible quantify the anticipated platform upgrade costs (SAP upgrade to Hana, PassPort upgrade to Asset Suite 9, etc.) for both the SAP and PassPort

alternatives. In the discussion include the amount and impact of customization for each alternative and the anticipated timing of the work and asset management migration.

42.2 Please elaborate on the reasons why it is not necessary to include the \$10 million or a portion of the \$10 million into the SCA Project and sustainment cost calculations. Is the estimated cost of SAP platform upgrades the same irrespective of the number of affected SAP modules?

42.2.1 Please provide a brief explanation of the future accounting treatment for the SAP platform upgrade costs. Will the costs be allocated to each SAP module and amortized over the remaining useful lives of the modules or will they be separately accounted for/amortized?

43.0 **Reference: COST ESTIMATE  
Exhibit B-1, Section 2.4.1, p. 2-15; Exhibit B-3, BCUC IR 13.7  
Contingency**

On page 2-15 of the Application, BC Hydro states that the mid-range cost estimate contingency has been calculated as 20 percent of the total value of future direct costs and that the upper accuracy range of the estimate is plus 15 percent.

43.1 What is BC Hydro's confidence (estimated probability) that it can complete the defined scope of SCA Project without exceeding the upper accuracy range (15%) of the project cost estimate?

44.0 **Reference: COST ESTIMATE  
Exhibit B-4, BCOAPO IR 6.1  
Project and Portfolio Management SAP project**

In response to BCOAPO IR 6.1, BC Hydro stated:

... the actual cost of the Project and Portfolio Management Project increased compared to the estimate at the completion of Definition Phase, as a result of higher costs due to complexity and to accommodate impacts of the British Columbia Transmission Corporation integration, additional customization effort to address user needs, and extending the stabilization period for Wave 2 roll out for seven months, deemed necessary to reduce the impact of change management.

44.1 Please discuss the nature of the 40 percent cost overrun with reference to the inclusion of the British Columbia Transmission Corporation (BCTC). At what stage was the project at when the scope was changed to include BCTC? Please discuss the likelihood that the project have been completed on budget had BCTC not been included in the scope.

## **B. ALTERNATIVE ANALYSIS**

45.0 **Reference: ALTERNATIVE ANALYSIS  
Exhibit B-3, BCUC IR 7.1  
PassPort alternative – capability gap score**

In response to BCUC IR 7.1 BC Hydro stated:

Where integration dependency was considered high, and BC Hydro did not believe that the integration could be reasonably built, the capability score for the application was adjusted down. Using the example above of capability gap 5, PassPort was assigned a

score of 2 for its ability to close the capability gap and this was reduced to a score of 0 after considering the complexity of integrating PassPort with BC Hydro's existing project management systems.

- 45.1 For the capability gaps where the integration dependency was high and the corresponding score was adjusted down, please confirm that the PassPort cost estimate is based on the effort required to achieve the integration scope corresponding to the lower score. If not confirmed, please explain why not and discuss the potential impact of the changed scope of integration on the cost estimate.

46.0 **Reference: ALTERNATIVE ANALYSIS  
Exhibit B-1, Section 3.3.1; Attachment P, p. 22  
Cost of alternatives**

In Section 3.3.1 of the Application, BC Hydro states it has not developed a conceptual design for Alternative 2 (PassPort) and that the corresponding cost estimate accuracy range of +100%/-35% corresponds to an AACE International Class 5 cost estimate.

- 46.1 Please discuss what the cost, effort and timing of obtaining a Class 4 cost estimate would be for the Alternative 2 (Passport) alternative. What would be the cost, effort and timing for Class 3 estimate?
- 46.2 Noting that Attachment P is a 2015 document, please comment on the current validity of the total lifecycle cost estimate of \$40 to \$53 million for the PassPort Base alternative.

47.0 **Reference: ABB Evidence Submission  
Exhibit C-3-3, pp. 2-3; Exhibit B-1, Section 3.3.6; Attachment F, Tab F2  
Gap 1: Inability to manage service-related spend**

On pages 2 and 3 of ABB's Evidence, ABB states that its software includes the Asset Suite Contract Management application and describes its functionality with respect to managing contracts. ABB also states that the Asset Suite Compose tool would allow BC Hydro to add, update, or rename fields, which "should readily allow for all services to be defined as manageable work units" and that it is questionable as to why Asset Suite would score a 2 on its ability to close gap 1.

In Section 3.3.6 of the Application, BC Hydro states that the recurring monetized benefits range for the SAP option are higher by between \$5 and \$9 million per year.

- 47.1 Please confirm that for the Potential Benefits Mid listed in Tab F2, 76% (\$6.0 million) of the total difference (\$7.9 million) in annual benefits between Alternative 1 (SAP) and Alternative 2 (PassPort) is a result of PassPort scoring a "2" or 50% on its ability to close Gap 1.
- 47.1.1 Please differentiate variable services from non-variable services and explain why they cannot be defined as manageable work units in PassPort. Please describe the additional functionality SAP Supply Chain has that allows variable services to be defined as manageable work units.
- 47.1.2 Was the assessed inability of PassPort to define variable services as manageable work units the sole determining factor in its lower score? If not please explain the other factors providing an approximate proportion to each.
- 47.1.3 How much is the annual service related spend that is managed by Supply Chain and approximately what percent of this is for variable services? Please explain or otherwise reconcile how \$6.0 million in annual savings can be achieved by adding the capability to

define variable services as manageable work units (and any other factors identified above).

47.2 Did BC Hydro consider ABB's proposed solutions (Asset Suite Contract Management application and Asset Suite Compose tool) to close Gap 1 when ranking its ability to close the gap? If not, why not? If BC Hydro's assessment of Asset Suite's ability to close Gap 1 has changed, please provide the revised ranking in a percentage basis and provide an explanation.

47.2.1 If ABB's proposed solution to close Gap 1 is technically feasible but would require more ongoing effort to implement, please characterize the nature and quantity of the additional ongoing effort to implement this solution as compared to the proposed SAP solution.

48.0 **Reference: ABB Evidence Submission  
Exhibit C-3-3, pp. 3-4; Exhibit B-1, p. 3-9, Attachment F, Tab F1  
Gap 2: Limited contract management**

On page 3-9 of the Application, BC Hydro states that in SAP, more real-time operational contract information is available to users than in Passport and requisitions allow for both services and materials in one process unlike PassPort.

On pages 3 and 4 of ABB's Evidence, ABB states that as part of Purchased Materials, users can enable the viewing of real-time operational contract information of both materials and services.

The Problem Statement for Tab F1, Row 5, states "The current data model doesn't currently support unitization of Services. Also Materials have poor master data in the system."

48.1 Please confirm that 96 percent or \$5.75 million of the \$6.0 million of the Potential Benefits Mid for closing Gap 2 come from the Row 5 Potential Benefit of "Reduction in cost of non-stock materials and services through category management."

48.2 Please confirm that for the Potential Benefits Mid listed in Tab F2, 19 percent (\$1.5 million) of the total difference (\$7.9 million) in annual benefits between Alternative 1 (SAP) and Alternative 2 (PassPort) is a result of PassPort scoring a "3" or 75 percent on its ability to close Gap 2.

48.2.1 Is the problem that the "current data model doesn't currently support unitization of Services" the same issue identified for Gap 1, i.e., the inability to define variable services as manageable work units? If not, please explain the difference. If yes, approximately how much of the \$1.5 million difference between Alternative 1 (SAP) and Alternative 2 (PassPort) can be attributable to the lack of ability to define variable services as manageable work units?

48.3 What portion of the \$2.5 billion in annual spend is impacted by PassPort's current lack of support for unitization of services?

48.3.1 Is the "more real-time operational contract information" available in SAP the same gap as "Materials have poor master data in the system" from Tab F1, Row 5? If not, please explain the difference and explain why "poor master data" is considered a gap in the current the PassPort system.

48.4 Did BC Hydro consider ABB's proposed solution (Purchased Materials) to close Gap 2 when ranking its ability to close the gap? If not, why not? If BC Hydro's assessment of Asset Suite's ability to close Gap 2 has changed, please provide the revised ranking in a percentage basis and provide an explanation.

- 49.0 **Reference: ABB Evidence Submission**  
**Exhibit C-3-3, pp. 3–4; Exhibit B-3, BCUC IR 7.1**  
**Gap 5: Difficulty managing the supply chain for capital projects**

In response to BCUC IR 7.1, BC Hydro stated that the capability score for PassPort was adjusted down from a 2 (based on technical ability) to 0 after considering the high complexity of integrating PassPort with BC Hydro’s existing project management as it did not believe that the integration could be reasonably built.

On pages 3 and 4 of ABB’s Evidence, ABB states that Asset Suite has multiple avenues for integrating to other business information systems including SAP Project Systems and that numerous utility installations can testify to this functionality.

- 49.1 What avenues did BC Hydro consider for integrating Asset Suite with SAP Project Systems? Please explain why further avenues were not explored.

Rows 31, 33, 39, 40, 41 and 63 of Tab F1 in Attachment F are all mapped to capability gap 5 (Difficulty managing the supply chain for capital projects) and have no quantified impact.

- 49.2 Please explain why BC Hydro has not assigned any monetized benefit to closing gap 5.

- 50.0 **Reference: ABB Evidence Submission**  
**Exhibit C-3-3, p. 9; Exhibit B-1, p. 3-11**  
**Gap 10: No self-serve option for routine service requests**

BC Hydro states that automation of routine procurement is dependent on a services catalogue and that given that Alternative 2 (PassPort) has more a limited services catalogue capability than SAP, it scored 3 while Alternative 1 (SAP) scored 4.

ABB states that it is unclear why Asset Suite (PassPort) is perceived as having a more limited services catalogue, or why this couldn’t be automated.

- 50.1 What specific service catalogue capabilities does PassPort lack? Please discuss the missing capabilities in the context of the overall capabilities and provide detailed justification of PassPort’s benefit inclusion at 75 percent (a score of 3).

## **C. BENEFIT REALIZATION**

- 51.0 **Reference: BENEFIT TRACKING**  
**Exhibit B-3, BCUC IRs 28.1, 28.1.1; Exhibit B-1, Appendix F, Tab F1; BC Hydro Inquiry of Expenditures SAP Platform, Exhibit B-6, BCUC IR 13.7**  
**Metrics and measures**

In response to BCUC IR 13.7 in the SAP Inquiry proceeding, BC Hydro states that Benefits Realization Management is not currently applied to IT projects and that BC Hydro intends to develop a benefit realization plan by March 31, 2017 and implement a benefit realization process by March 31, 2018.

In response to BCUC IRs 28.1 and 28.1.1, BC Hydro stated “Yes, benefit realization plans will include direct and indirect metrics and measures for tracking the realization of financial benefits.”

The following table prepared by Commission staff has been filtered from Exhibit B-1, Appendix F, Tab F1 and includes Potential Benefits with a mid-benefit of \$1 million or greater which account for 85 percent of the estimated benefits.

ID	Potential Benefit	Calculation Logic	Potential Benefit Mid
5	Reduction in cost of non-stock materials and services through category management.	The baseline is the total 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.	5750
7	Reduction of effort in operations managing completion of work.	Approximately 4,000 people work in PassPort performing supply 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.	3902
14	Reduction of cost of capital through an increase in inventory turns.	Calculation financial benefit resulting from an increase in the inventory turn ratio is calculated differently than other benefits in this list. 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 could be increased to between 2 and 2.5 which would result in a savings of \$1.2 to \$2.4 million a year through lower carrying costs.	1772
26	Reduction of effort in operations and projects approving invoices.	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.	5756
29	Reduction of effort manually performing accruals.	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 #26, 75% of all invoices are manually approved. Assume that 80% of invoices require an accrual (smaller invoices, 20%, don't require accruals).	1771
60	Reduction of cost of materials by reducing premiums paid for spot buy activity.	BC Hydro spends approximately \$200 million a year on stock materials. It is estimated that approximately 30% of MRs result in an expedited purchase, and this creates a 15% increase in cost.	4500

- 51.1 Describe the effort BC Hydro has put toward identifying measures and metrics to date? Please list identified potential measures and metrics, if any.
- 51.2 For each of the Potential Benefits listed above please indicate whether it likely will be tracked by direct or indirect metrics and measures. For each Potential Benefit that is likely to be tracked with indirect metrics and measures, discuss the expected effectiveness of potential metrics and measures in accurately tracking the realization of financial benefits.
- 51.3 Does BC Hydro believe it to be appropriate to report their progress on benefit realization to the Commission? If not, why not? If yes, what start and end date, frequency and form (i.e. separate compliance filing or included in another reporting requirement) would BC Hydro suggest?
- 51.4 When does BC Hydro expect to finalize the metrics and measures? Please explain why the business impacts of the final design will not be fully assessed in the Definition Phase. Why are the assessed business impacts not required inputs to the selection of the Final Design? How will the design options be adequately assessed without a full understanding of the business impacts?
- 51.5 Did BC Hydro complete a benefits realization plan? If yes, please attach a copy.
- 51.6 Given that BC Hydro's benefits realization process is planned to be in place by March 31, 2018, please discuss any challenges of applying the process to the SCA Project. Does BC Hydro intend to apply the process to the SCA Project?
- 51.7 Describe the effort BC Hydro will undertake to establish pre-SCA Project baselines for measures and metrics. When will the baselines be established?