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May 24, 2017

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

Dear Mr. Wruck:

**RE: Project No. 3698901
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Supply Chain Applications Project Application**

BC Hydro writes as required by Exhibit A-10, Commission Order G-78-17 to provide its Rebuttal Evidence to the intervener evidence and responses to information requests filed by ABB Enterprise Software (ABB).

BC Hydro is filing portions of this Rebuttal Evidence confidentially with the Commission only pursuant to section 42 of the *Administrative Tribunals Act* and in accordance with Part IV of the British Columbia Utilities Commission's Rules of Practice and Procedure. BC Hydro is filing confidentially the portions of this Rebuttal Evidence that refer to evidence of ABB that ABB has filed confidentially. BC Hydro has also redacted the results of the ARC Advisory Group's Enterprise Asset Management Global Market Research Study that are reproduced in this Rebuttal Evidence. This is a third party study which is not publicly available, and BC Hydro does not have permission to reproduce the study publicly.

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

Yours sincerely,

A handwritten signature in black ink, appearing to read "Fred James", written over a white background.

Fred James
Chief Regulatory Officer

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Supply Chain Applications Project

**Rebuttal Evidence of
British Columbia Hydro and Power Authority**

May 24, 2017

PUBLIC

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1 Purpose of BC Hydro's Rebuttal Evidence

Q1. What is the purpose of this rebuttal evidence?

A1. The purpose of this rebuttal evidence is to respond to the intervenor evidence and responses to information requests filed by ABB Enterprise Software (ABB), which are marked as Exhibits C3-3, C3-5, and C3-5-1 in this proceeding.

Q2. Has BC Hydro addressed in this Rebuttal Evidence every aspect of ABB's evidence with which it takes issue?

A2. No. This Rebuttal Evidence includes responses to the main points of ABB's evidence only where responses were necessary to provide additional evidence to what is already on the record in the proceeding. Further, much of ABB's evidence is in the nature of argument or marketing material that was not directly responsive to BC Hydro's position. As we have sought to avoid repetition and have not attempted to respond on a line-by-line basis, our silence on particular matters should not be interpreted as agreement with ABB.

Q3. Why has BC Hydro redacted some of its evidence and filed it on a confidential basis?

A3. BC Hydro has redacted portions of this Rebuttal Evidence that refer to evidence of ABB that ABB has filed confidentially.

BC Hydro has also redacted information from the ARC Advisory Group's Enterprise Asset Management Global Market Research Study (ARC Study) that is reproduced in this Rebuttal Evidence. The ARC Study is a third party study which is not publicly available.

2 A Major Upgrade to Asset Suite 9 is Not Feasible

Q4. In its responses to information requests, ABB claims that an upgrade to Asset Suite 9 would be relatively straightforward and would address all of the capability gaps. Is Asset Suite 9 a feasible alternative for the Supply Chain Applications Project?

A4. No, a major upgrade to Asset Suite 9 is not a feasible alternative for the Supply Chain Applications Project. BC Hydro recognizes that ABB's Asset Suite is a reputable Enterprise Asset Management (EAM) solution with a focus on power generation and, in particular, nuclear power generation. However, BC Hydro is looking for an enterprise-wide supply chain system that will be used not only for asset management, but across the organization. BC Hydro will not invest in a major upgrade to Asset Suite 9 at this time; nor does BC Hydro foresee a viable business case to do so in the future.

Q5. Please explain why Asset Suite 9 is not a feasible alternative.

A5. A major upgrade to Asset Suite 9 is not a feasible alternative for four main reasons.

First, the scope of a major upgrade to Asset Suite 9 is significantly greater than the scope of the Supply Chain Applications Project. BC Hydro currently uses Asset Suite 8 for work management, asset management and supply chain. If BC Hydro were to implement a major upgrade to Asset Suite 9, BC Hydro would need to upgrade its work management and asset management functions and business processes, in addition to its supply chain. Such an upgrade would be a large transformation initiative spanning work management, asset management, and supply chain. It would be inaccurate to categorize such a project as a straightforward technical upgrade. Further, BC Hydro has significant customizations built on Passport and custom

applications built to work with Passport. It is not known how Asset Suite 9 would work with these customizations. A major upgrade to Asset Suite 9 would be a different, and larger, project than the Supply Chain Applications Project.

Second, the scope of a major upgrade to Asset Suite 9 would greatly increase risk due to the extent of business change that will be required. As noted above, if BC Hydro were to implement a major upgrade to Asset Suite 9, BC Hydro would have to upgrade all of its work management and asset management functions and business processes, in addition to its supply chain. The scope of the change management required for such a project would be much greater, as it would impact a larger user base, including all contractors and employees using Asset Suite for asset management (e.g. processing work orders), who would not be impacted by the Supply Chain Applications Project. An Asset Suite 9 upgrade would also require: changes to the end user interface and the backend technical codebase (i.e. COBOL to Java); and re-validation of all existing integration points, customizations, and existing business processes.

As discussed in Chapter 4 of the Application, BC Hydro made the strategic decision in 2013 to proceed with its Transformation Blueprint IT Projects (including work management, asset management and supply chain, amongst others) in a measured way to reduce risks. This decision has reduced the risk of the Supply Chain Applications Project. In BC Hydro's assessment, it would not be prudent to upgrade its work management, asset management and supply chain functions in a single project.

Third, Asset Suite (either version 8 or 9) does not meet BC Hydro's supply chain business requirements as well as SAP. Asset Suite is primarily an Enterprise Asset Management product. Enterprise Asset Management

products focus on the maintenance of plant assets. Asset Suite focuses on asset and work management functionality, and has supply chain functionality primarily focused on the maintenance of plant assets. While Asset Suite is a leading Enterprise Asset Management product for power generation utilities, it is not a leading product for transmission and distribution¹ or a leading supply chain product. As indicated in response to BC Hydro IR 1.1, [REDACTED]

In contrast, SAP offers a comprehensive common platform product, which includes asset management, but also modules such as finance, customer care, project management, and human resources. SAP's supply chain module is more fulsome than Asset Suite with regard to how it manages services and integrates with project management. Given the size of BC Hydro's capital portfolio, the need to improve the management of services and the integration with project management is a primary business driver for the Supply Chain Applications Project. As BC Hydro already uses SAP for customer care, finance, human resources, and project and portfolio management, the use of SAP for supply chain reduces manual efforts and complexity related to using two different platforms and removes the need for interfaces between two platforms. Further, a large portion of BC Hydro's current users of Asset Suite are also users of SAP, and only use Asset Suite for supply chain, not asset management. Using SAP for supply chain will simplify the experience for these users as they would only have to use one platform. Using SAP for supply chain will also position BC Hydro to be able to phase-out Asset Suite in the future and eliminate the operating costs associated with maintaining two platforms.

¹ See Figure 1 in A16 below.

Fourth, given the significant scope and change management issues associated with an upgrade to Asset Suite 9, BC Hydro is not willing to bear the risk of being an early adopter of Asset Suite 9. See BC Hydro's response to BCUC IR 1.7.2 and 2.42.1.

3 ABB's Cost Estimate for an Upgrade to Asset Suite is Incomplete and Unreliable

Q6. In its responses to information requests, ABB discusses the timeframe and cost of an upgrade to Asset Suite and compares this to the implementation of SAP. Does the information provided by ABB change BC Hydro's views on the estimated costs and time to implement a Passport-based supply chain solution?

A6. No, ABB's evidence does not change BC Hydro's estimate of the costs or schedule to implement a Passport-based supply chain solution.

First, ABB's evidence on costs is incomplete and provides no basis on which to estimate total project costs. ABB's estimate of [REDACTED]

[REDACTED] BC Hydro's System Integrator cost for the Supply Chain Application's Project, as determined through a competitive tendering process, is [REDACTED] BC Hydro's costs for an upgrade to Asset Suite would include the following:

- All internal BC Hydro staffing on the project
- Project management
- Change management and training

² Exhibit C3-5-1, p. 30.

- Development of interfaces in the “legacy systems”
- Rebuild customizations and custom applications
- Business process design
- Independent quality assurance and risk mitigation services
- Regulatory and procurement

Second, ABB’s characterization of the cost and timeframe for “typical Asset Suite projects” is not consistent with BC Hydro’s experience. For example, the initial implementation of Passport across BC Hydro from 1997 to 2003, cost approximately \$50M,³ and utilized a team size of approximately 100 resources at its peak.

Third, the costs of implementing a supply chain IT system are driven to a large extent by BC Hydro’s business requirements, rather than the choice of IT product alone. The scope and objectives of IT projects can vary widely. They can be enterprise wide, or limited to a single business unit or site. They can also be limited to a technical upgrade, or seek to implement improved or new business processes. The Supply Chain Applications Project must be delivered across a large vertically integrated utility, and is not just a technical upgrade. The project aims to transform and improve supply chain business processes across the company and will impact all users involved in supply chain, not just those responsible for asset maintenance. As described in Chapter 2 of the Application, approximately 4,000 of BC Hydro’s 5,500 employees have contact with the supply chain in a year.

The factors that impact the Project cost include:

³ The approximately \$50 million is in 2003 dollars. Escalated to 2017 dollars, this would be approximately \$64M, using the Statistics Canada historical consumer price index rates for each year. Online: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ46a-eng.htm> .

- The extent of business processes being transformed
- The number of impacted stakeholders and the degree of change
- The complexity of the technical landscape (e.g. having to develop interfaces to PassPort)
- Risk tolerance (use of external quality assurance and system integrator)
- Regulatory review and approval process

BC Hydro is in the best position to assess the key drivers of the scope and resulting cost of the Supply Chain Applications Project.

Fourth, due to the broader functionality of SAP, it is not appropriate to compare the cost of implementing all of SAP ERP Central Component (ECC) with the cost of implementing Asset Suite. Whereas Asset Suite is an Enterprise Asset Management solution, SAP ECC includes Enterprise Asset Management, but also finance, human resources, supply chain, customer care, project management, and other functions. The Supply Chain Applications Project is only implementing SAP for supply chain; this is not comparable to a full implementation of SAP ECC.

Fifth, ABB relies on the fact that Asset Suite is not a financial system to support lower costs of implementation compared to SAP.⁴ BC Hydro is already using an SAP-based finance system. The fact that Asset Suite does not include a financial system increases the cost of an Asset Suite implementation as interfaces between Asset Suite and BC Hydro's finance system must be developed and maintained.

⁴ Exhibit C3-5, p. 3.

4 Asset Suite Cannot Close all Capability Gaps

Q7. Do ABB's responses to information requests change BC Hydro's assessment of Asset Suite's ability to close the capability gaps as updated in BC Hydro's responses to BCUC and intervener round 2 information requests?

A7. No.

Q8. In response to CEC-ABB IR 4, ABB was asked to discuss why its Service catalogue is not more limited than SAP's catalogue. Does the information provided by ABB change BC Hydro's view on the capabilities of Asset Suite?

A8. No. ABB discusses [REDACTED] but does not describe a service catalogue. Asset Suite does not have a services catalogue.

Q9. In response to CEC-ABB IR 6, ABB asserts that it would rate as a 4 for capability gap 12. Does BC Hydro agree?

A9. No. ABB describes some of Asset Suite's functionality and some of its limitations, but ABB does not address BC Hydro's stated business requirements. As BC Hydro's projects and portfolio management, finance and human resources systems are SAP-based, BC Hydro can never fully close capability gap 12 with Asset Suite.

Q10. In response to CEC-ABB IR 7, ABB asserts that there is no need to integrate Asset Suite Work Management with any other work management system and that it would rate as a 4 for capability gap 13. Does BC Hydro agree?

A10. No. ABB's claim that there is no need to integrate Asset Suite work management with any other work management system is false. BC Hydro uses work managements systems other than Asset Suite (including SAP for customer care; Spatial Asset Management (SAM); and System for Transmission Asset Recording & Reporting (STARR)).⁵ These are not redundant systems. BC Hydro's transmission, distribution, and customer functions have unique requirements that are not covered by Asset Suite. For example, for transmission and distribution, BC Hydro needs spatial and geographic information system integration, and for the customer function BC Hydro needs integration with its call centre. ABB's response demonstrates that it does not understand the scope and complexity of BC Hydro's business or its IT environment.

5 BC Hydro's Alternatives Risk Assessment is Correct

Q11. Does any of ABB's evidence, including responses to information requests, change BC Hydro's assessment of the relative risks of the SAP and Passport/Asset Suite alternatives?

A11. No. ABB has not provided any information that addresses the risks identified by BC Hydro or that changes BC Hydro's alternatives risk assessment.

⁵ See Exhibit B-1, Application, p. 2-12, footnote 12.

Q12. ABB states that BC Hydro “is upgrading a core business function (Supply Chain and Work Mgmt together)”.⁶ Is this true?

A12. No. BC Hydro is only upgrading supply chain. BC Hydro’s work management functions will remain in PassPort and other systems (such as Spatial Asset Management and System for Transmission Asset Recording & Reporting). As noted in A5 above, BC Hydro decided not to upgrade its work management and supply chain functions at the same time in order to mitigate risk. BC Hydro will make a decision on when and how to upgrade the work management function at a future time.

6 BC Hydro’s Common Platform is Fully Integrated and Up to Date

Q13. ABB states that many of SAP’s modules are actually acquisitions it has made from smaller companies, which create the perception of a “Common Platform.” Does BC Hydro agree?

A13. ABB’s characterization that SAP modules were built through a series of acquisitions is incorrect. SAP’s core ECC product, upon which BC Hydro’s common platform strategy is based, is a single application (i.e. uses a single set of program code, stores data in a single database, and is upgraded as a single unit). SAP’s core ECC product was developed internally by SAP, and not through acquisitions.

Ariba is the only portion of the IT solution proposed by BC Hydro as part of the Supply Chain Applications Project that is a separate application and/or acquisition (i.e. use separate code bases and databases). All of the other components of the IT solution will be delivered through SAP’s core ECC product, which is an integrated platform.

⁶ Exhibit C3-5, p. 18.

SAP acquisitions such as the Ariba e-commerce solution are generally intended to be “bolted-on” to SAP’s core ECC solution to expand its capabilities. However, acquisitions by SAP are not part of BC Hydro’s common platform strategy, which is based on SAP’s core ECC product.

Ariba was selected by BC Hydro as a “bolt-on” solution for e-commerce prior to its acquisition by SAP. Were BC Hydro to implement a PassPort-based supply chain system, Ariba would still be used as its e-commerce solution.

Q14. ABB states that ‘BC Hydro’s Supply Chain application touts the merits of a “Common Platform” across all business functions without much discussion around the state of the individual SAP modules’. What is BC Hydro’s response?

A14. ABB’s characterization of BC Hydro’s common platform and the suggestion that it is in varying states of technical health is incorrect. The SAP ECC application is made up of a series of integrated modules, including: finance, customer care, project management, human resources, supply chain, and enterprise asset management. BC Hydro’s SAP ECC enterprise suite is upgraded annually as a single unit, and is technically up-to-date on Enhancement Pack 8.

7 Asset Suite’s Market Share is Centred on Power Generation, not Transmission and Distribution

Q15. ABB provides the results of the ARC Advisory Group’s Enterprise Asset Management Global Market Research Study for Electric Power Generation. What comments does BC Hydro have on these study results?

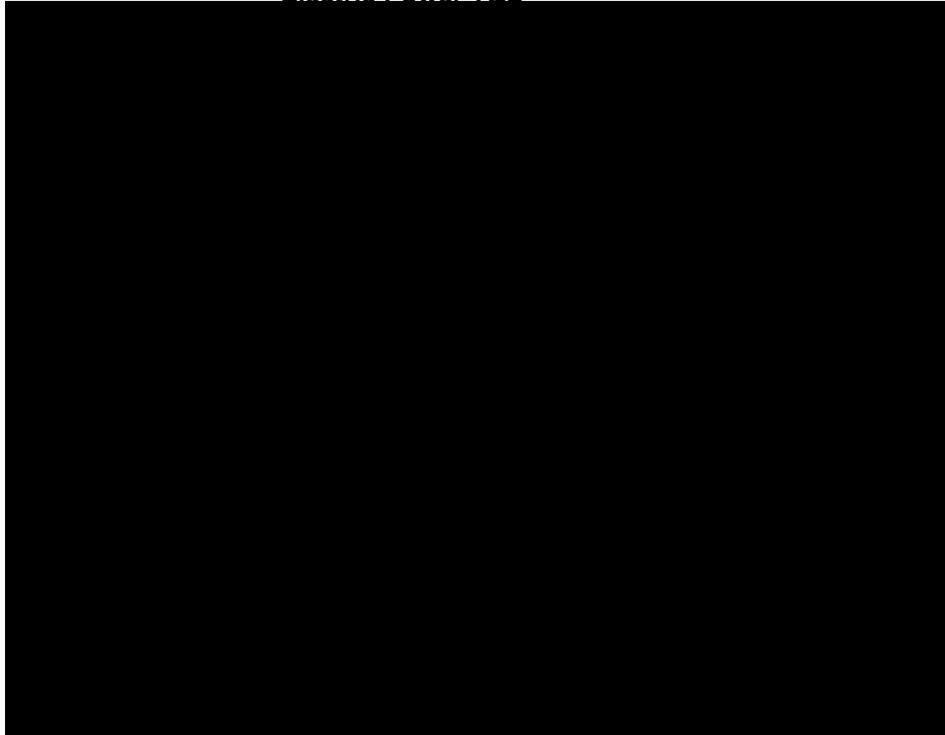
A15. ABB has not presented a complete picture of the results of the ARC Study. BC Hydro provides the information below to put the results of the ARC Study

in context and to present a fuller picture of the results insofar as they relate to BC Hydro's Supply Chain Applications Project.

The ARC Study relates to Enterprise Asset Management. As discussed above, Enterprise Asset Management is focused on asset maintenance. As a vertically-integrated utility, BC Hydro's supply chain requirements are much broader than asset maintenance, and include management of contracts and integration with projects, and involve non-inventoried materials and services. As the ARC Study is focused on Enterprise Asset Management, it is not the most relevant market study for the Supply Chain Applications Project. Please refer to BC Hydro's response to BCUC IR 1.1.3 for a discussion of two reports on supply chain application vendors, which show SAP as the top rated vendor.

ABB's evidence shows Figure 3-12 of the ARC Study related to leading suppliers of Enterprise Asset Management for power generation. ABB does not present Figure 3-13 of the ARC Study, which shows the leading enterprise asset management suppliers in the category of Electric Power Transmission and Distribution. As shown below, ABB does not appear as a leading supplier in this category:

Figure 1 ARC Study – Leading Suppliers of
Enterprise Asset Management for
Electric Power T&D



BC Hydro is a vertically integrated utility, with generation, transmission, distribution, and retail functions. Moreover, the majority of BC Hydro's overall active inventory is used for transmission and distribution related work.⁷ The supply chain requirements for transmission and distribution are different than for generation.

The ARC Study confirms that Asset Suite is an Enterprise Asset Management product focused on power generation, particularly nuclear. As stated in the ARC Study, [REDACTED]

[REDACTED]

[REDACTED]

⁷ Exhibit B-6, BCUC IR 2.35.1.

[REDACTED]

The ARC Study states that:

[REDACTED]

[REDACTED]

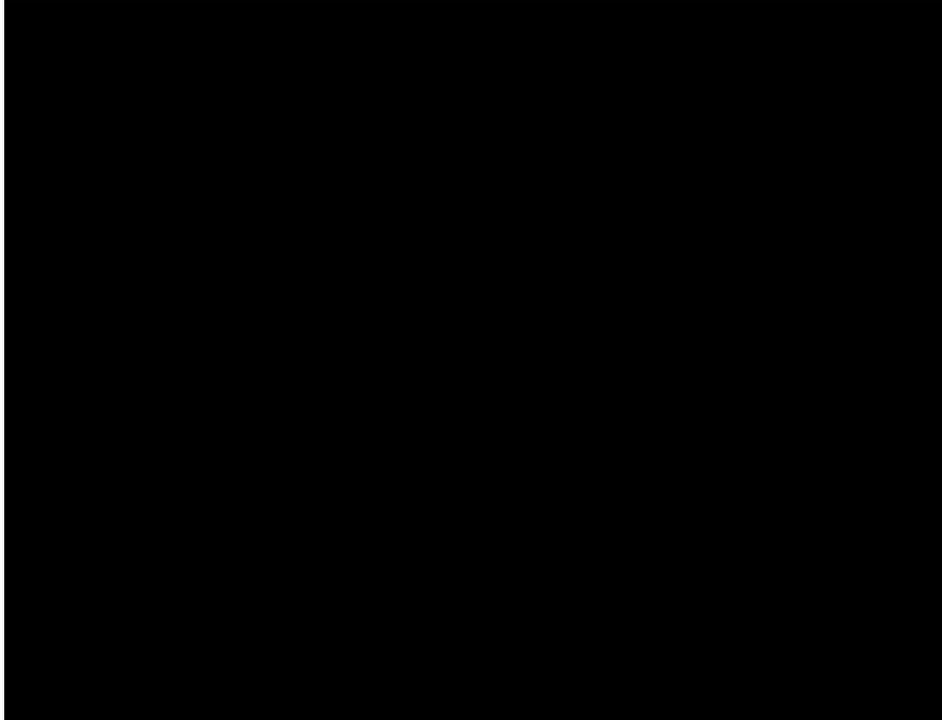
[REDACTED]

Bruce Power has stated that it will be replacing all current Passport applications in summer 2018 with IBM's Maximo.⁸

For completeness, BC Hydro also reproduces below Figure 3-29 of the ARC Study showing the leading enterprise asset management suppliers for companies with revenue greater than \$1 billion (a category within which BC Hydro falls):

⁸ <http://www.brucepower.com/suppliers/business-plan/>

Figure 2 ARC Study – Leading Suppliers of
Enterprise Asset Management for



The split in market share between ABB's two Enterprise Asset Management products (Asset Suite and Ellipse) is not shown in the ARC Study. It is not clear what ABB's market share of this category would be solely based on Asset Suite.