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August 30, 2021

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: Project No. 1598975
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Supply Chain Applications Project (SCA Project)
Benefits Realization Annual Report No.1

BC Hydro writes to provide the Supply Chain Applications Project (**SCA Project**) Benefits Realization Annual Report No.1.

As directed in Order G-78-19, BC Hydro will file annual updates on benefits realization information from the in-service date of the SCA Project until the estimated Monetized Benefits have been achieved or the tenth anniversary of the in-service date, which ever is the sooner. The first update is to include the baselines developed during the Implementation Phase, and the metrics and measures for tracking the realization of benefits against the developed baselines which will be applied to each subsequent update.

For further information, please contact Joe Maloney at 778-879-7173 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Chris Sandve
Chief Regulatory Officer

ls/tl

Enclosure

BC Hydro
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BC Hydro Supply Chain Applications Project

Benefits Realization Annual Report No. 1

F2021

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1 Introduction

BC Hydro identified 13 capability gaps in its previous supply chain system, which the implementation of the Supply Chain Applications Project (**SCA Project** or **Project**) will close. By closing these capability gaps, BC Hydro anticipates realizing financial and risk-minimization benefits. The SCA Project was placed in service on August 4, 2020, and the new supply chain system and processes have been deployed across BC Hydro.

In Order G-78-19, the British Columbia Utilities Commission (**BCUC** or **Commission**) directed BC Hydro to file:

> Annual updates on benefits realization information from the in-service date of the SCA Project until the estimated Monetized Benefits have been achieved or the tenth anniversary of the in-service date, which ever is the sooner. The first update is to include the baselines developed during the Implementation Phase, and the metrics and measures for tracking the realization of benefits against the developed baselines which will be applied to each subsequent update.

In compliance with the above Order, BC Hydro provides this Benefits Realization Annual Report No. 1 (**Report**). To align the annual reporting on benefits realization from the Project with the end of BC Hydro's fiscal year, the next SCA Project Benefits Realization Annual Report will be filed with the BCUC in May 2022, and annually thereafter, until the estimated monetized benefits have been fully realized or the tenth anniversary of the in-service date of the Project, whichever is sooner.

As discussed in the Phase Two Verification Report (**Verification Report**) submitted to the Commission on October 12, 2018, no benefits were forecast in the first year after the Project is placed into service as the system and processes require time to stabilize. As it has only been one year since the Project was put in service, and consistent with the benefits ramp up period outlined in the Verification Report, there are currently no benefits to report.

In the Benefits Realization Update Report filed with the Commission on October 30, 2020, BC Hydro provided updates on the baselines developed during the Implementation phase, and the metrics and measures for tracking the realization of benefits against the developed baselines. BC Hydro also provided updates on the expected quantified benefits (**Expected Benefits**) and the expected monetized benefits (**Monetized Benefits**) at the end of the Implementation phase. There have been no changes to the Expected Benefits and Monetized Benefits amounts, or the underlying baselines, metrics and measures since the Benefits Realization Update Report was filed.

There has, however, been a change to the benefits realization ramp-up timeline for some benefits, as previously reported in the Project's Progress Report No. 4 filed with the BCUC on April 30, 2021. This is discussed below in section 2.1 of the Report.

In this Report, BC Hydro provides the template for the benefits measurement scorecard that was explained in the October 30, 2020 Benefits Realization Update Report, but was under development at that time. The benefits measurement scorecard will be used for ongoing benefit realization reporting.

2 SCA Project Benefits

2.1 Expected Benefits

As discussed in the Verification Report, the Expected Benefits will result in reduced cost and / or reduced effort for BC Hydro, as discussed below:

(a) **Cost Reduction Benefits:** Cost reduction benefits are comprised of cost savings and cost avoidance benefits. Cost savings benefits are a reduction in existing expenditures and cost avoidance benefits are a reduction in expected future increases in expenditures. These benefits can be quantified and monetized; and

(b) **Effort Reduction Benefits:** Effort reduction benefits are those that can be achieved through eliminating or streamlining efforts to save time. Effort benefits are quantified by assessing the savings on employee time per year in hours or dollars. Effort benefits may be monetized when time reductions are high and concentrated to a small group, but would be difficult to monetize if time reductions are of shorter duration and spread out over many resources or business units.

The following assumptions were used in determining the Expected Benefits (as updated in the Project's Progress Report No. 4 filed with the BCUC in April 2021):

(i) No benefits are forecast until August 2021 (one year after the Project in service) as the system and processes require time to stabilize;

(ii) Cost Reduction Benefits begin one year after the Project goes into service and ramp up over a four-year period, while monetized effort benefits begin two years after the Project goes into service and ramp up over a two-year period.

- Cost Reduction Benefits are expected to be at 100 per cent by the end of a five-year period. After the first year of stabilization period, Cost Reduction Benefits ramp up over the next four years, totaling a five-year ramp up. Cost Reduction Benefits are assumed to take longer than Effort Reduction Benefits to ramp up because they are often dependant on new contracts being in place. A longer ramp up period allows for contracts to expire and new contracts to be negotiated; and
- Effort Reduction Benefits are expected to be at 100 per cent by the end of a four-year period. After the second year of stabilization, Effort Reduction Benefits ramp up over the next two years for a total of a four-year ramp up period. Effort Reduction Benefits require that users be proficient with the new tools and processes, and this is reflected in the four-year ramp up period.

As previously reported in the Project's Progress Report No. 4 in April 2021, effort reduction benefits were originally assumed to ramp up after the first year of stabilization and reach 100 per cent by the end of a three-year period. However, effort reduction benefits require users to be proficient with the new tools and processes. As most of the system's end-users continue to work remotely due to the COVID-19 pandemic, stabilization of the system and processes is taking longer and effort benefits are taking longer to materialize. BC Hydro now expects effort benefits to ramp up in August 2022 and reach 100 per cent by August 2024. There has been no change to the expected timing for cost benefits realization.

2.2 Monetized Benefits

As outlined in the Verification Report, the following approach was used to estimate how much of the Expected Benefits can be monetized:

(i) The financial value of all Expected Cost Reduction Benefits can be monetized;

(ii) The financial value of Expected Effort Reduction Benefits where effort is concentrated, or the effort time savings are significant can be monetized; and

(iii) As the determination completed in (ii) was on the combined impact of total Expected Effort Reduction Benefits, BC Hydro discounted each discrete effort benefit value at the same rate to arrive at a monetized value at the benefit level.

As reported in the Benefits Realization Update Report, BC Hydro estimates overall it can monetize approximately 69 per cent of the value of the total Expected Benefits and 20 per cent of the value of the Expected Effort Reduction Benefits.

BC Hydro is reporting on the amounts of Monetized O&M Cost Savings to be achieved in the Fiscal 2023 to Fiscal 2025 Revenue Requirements Application.

Table 1 shows the ramp up of Monetized Benefits by fiscal year and provides a breakdown between cost savings and cost avoidance in order to identify the portions

that will be reflected in current and future revenue requirements applications[1]. As shown, the total Monetized Benefits ramp up after fiscal 2023 or second year after the in-service date and will be fully ramped up to $23.1 million by fiscal 2027.

Table 1 SCA Monetized Benefits by Fiscal Year

		($ million)								
	Notes	F23	F24	F25	F26	F27	F28	F29	F30	F31
Cost Savings Benefits										
Total Cost Savings O&M	1	501	1,345	2,189	2,634	2,689	2,689	2,689	2,689	1,345
Total Cost Savings Capital	2	727	2,092	3,457	4,108	4,182	4,182	4,182	4,182	2,091
Financing Costs - Reduced inventory	3	669	1,339	2,008	2,593	2,677	2,677	2,677	2,677	1,339
Total Cost Savings Benefits		1,897	4,776	7,653	9,335	9,548	9,548	9,548	9,548	4,774
Total Cost Avoidance Benefits		3,395	6,789	10,184	13,154	13,578	13,578	13,578	13,578	6,789
Total Monetizable Benefits	4	5,292	11,565	17,837	22,489	23,129	23,129	23,129	23,129	11,563
FTE Reduction (included in dollars above)	5	1	10	18	20	20	20	20	20	20

Benefits numbers in Table 1 may not add up in full due to rounding

Notes
1 Cost Savings O&M will be reflected in current and future RRAs.
2 Cost Savings Capital will be realized through reinvestment into BC Hydro's future projects.
3 Financial Costs Reduction targets will be realized over the current and future RRA Test Periods as BC Hydro's borrowing cost decrease.
4 Total Monetizable Benefits will be fully ramped up to $23 million by F27.
5 Effort Reduction Benefits will be monetized through reduction of 20 FTEs and will be reflected in current and future RRAs.

3 Benefits Tracking

3.1 Benefits Tracking Process

This section provides an overview of the expected benefits tracking process and the scorecard template that will be used for improved ongoing benefits realization reporting.

3.1.1 Benefits Tracking

BC Hydro will continue to track the Expected Benefits identified in the Appendix I provided with the Verification Report, except for Benefit ID #7 as explained in the

[1] Verification Report, page 3-6, lines 1-4**:** Cost reduction benefits are comprised of cost savings and cost avoidance benefits. Cost savings benefits are a reduction in existing expenditures and cost avoidance benefits are a reduction in expected future increases in expenditures.

Benefits Realization Update Report filed with the Commission on October 30, 2020. BC Hydro will be tracking eleven benefits that comprise approximately 84 per cent of the total Expected Benefits and 98 per cent of the total Monetized Benefits.

Table 2 below includes a high-level summary of the eleven tracked benefits.

Table 2 Summary of SCA Project Baselines, Metrics, and Measures

Benefit ID #	Benefit Type	Benefits Description	Updated Baselines	Updated Metrics	Updated Measures
2	Effort	Streamline the purchasing process via PO automation	4514 effort hours	Auto order volume, auto outline agreements	Effort hours
5	Cost	Reduced cost due to Active Contract & Supplier Management	$2.14 billion in addressable spend	Savings through active contract and supplier management	BC Hydro will calculate the benefit forecasted for a given spend category 'action' or 'intervention' or combination of actions
14	Cost	Reduction of cost of capital through an increase in inventory turns	$159 million inventory value	Inventory turns	Inventory value
16	Effort	Eliminate manual material reservations at Material Management	5 Full Time Equivalent (**FTE**)	FTE change	FTE change
26	Effort	Reduced effort to approve invoices	27,499 effort hours for invoice approval	Invoices paid based on SES, SES volume	Effort hours to complete SES
29	Effort	Reduction of efforts in manually performing accruals	52,325 effort hours in invoice accruals	Volume of auto accruals	Effort hours per accrual

Benefit ID #	Benefit Type	Benefits Description	Updated Baselines	Updated Metrics	Updated Measures
67	Effort	Reduced efforts to develop scope of work (**SOW**) via service catalogue	10,154 effort hours in preparing SOWs	Volume of orders where SOWs created from catalogue	Effort hours to develop scope of work from catalogue
102	Cost	Improved excess project material visibility	$1.09 million inventory in the staging tool	Material returns to inventory, material reissued	Value of materials reissued
103	Cost	Improved reel return management	Reel deposit write off $0.4 million	Actual reel deposit write-offs	Reduction in reel deposit write-offs
104	Cost	Reduction in inventory obsolescence write offs	Avg write-off of $1.1 million	Actual write-off	Reduction in write-off
105	Effort	Reduction in project forecasting effort	13,308 effort hours in project forecasting	Number of active projects and programs	Effort hours spent on project forecasting

The benefits tracking sheets included in Appendix A, similar to the Appendix I tracking sheets in the Verification Report, provide the baselines, the target benefit value, and the tracking plan for each benefit, as well as key information on the metric to be used and contributions to achieving the target benefit. There have been no changes to this information since filing the October 2020 Benefits Realization Update Report other than the following:

- The ramp up timeline for effort benefits has been updated to reflect the four year ramp up period as explained in section 2.1 of this Report;
- A reference to the benefits measurement scorecard has been inserted into those fields that will be reported in the benefits measurement scorecard as shown in Appendix B going forward rather than in the benefits tracking sheets in Appendix A (i.e., Measured Date, Performance Toward Achieving Target,

Suggested Corrective Action(s), Suggested Opportunistic Action(s), and Comments). Please refer to section 3.1.2 for more details; and

- Corrections of typos for Benefit ID #105 which was incorrectly labeled as a cost benefit, and Benefit ID #103 which was correctly labelled as a cost benefit but incorrectly tagged with a three-year ramp-up period.

The updated benefits tracking sheets are provided as Appendix A to the Report. BC Hydro does not expect any further changes or updates to the tracking sheets and as such, this version of the benefits tracking sheets in Appendix A will continue to be provided for reference in future Benefits Realization Annual Reports. The ongoing measurement of the tracked Expected Benefits will be reported in the benefits measurement scorecard, as discussed in the following section.

3.1.2 Benefits Measurement Scorecard

BC Hydro has developed a benefits measurement scorecard that will be used for reporting on the progress on the Benefit Realization Plan as described in the Benefits Realization Update Report filed with the Commission on October 30, 2020. The scorecard provided in Appendix B will replace only the benefit measurement section of the benefits tracking sheets included in Appendix A. The scorecard is an improved tracking template that is easier for the user to track and report benefits, and allows a more efficient and transparent review of BC Hydro's progress on realizing the eleven tracked benefits, both on an individual benefit level as well as on an overall program level, all in one place. It also contains the target and actual annual benefit amount of each tracked benefit and includes progress on realization of the Monetized Benefits.

The benefits measurement scorecard has three key sections:

1. Monetized Benefits

This section tracks the realization of Monetized Benefits, including total dollar value and (for monetized effort reduction benefits) FTE reductions achieved. As explained in the Verification Report, Monetized Benefits are a subset of Expected Quantified Benefits. As outlined in the Benefits Realization Update Report, total annual Monetized Benefits at full ramp up will be $23.1 million, including net reduction of 20 FTEs;

2. Tracked Expected Quantified Benefits

This section tracks the realization of the eleven tracked benefits listed in Table 2 above and in the Benefits Realization Update Report. As outlined in the Benefits Realization Update Report, total annual Expected Quantified Benefits at full ramp up will be $33.4 million.

3. Discussion and Analysis Narrative

This section includes a narrative explaining variances for each benefit that is not tracking to plan (e.g., where the actual benefit realized is significantly less than the target), as well as details of corrective or opportunistic actions planned.

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Benefits Realization Annual Report No. 1

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Appendix A

Benefit Tracking Form
Clean and Black-lined

Benefit Tracking Form

Supply Chain Applications

1. Project

Project Information	
Project Name	Supply Chain Applications Project
Project Description	Implementation of Supply Chain Applications
Project ID	YT-00486
Project In-Service Date	August 4, 2020
Project Participants	
Sponsor	David Wong
Initiator	Gurjit Parmar
Project Manager	Hugh Smith (Project Director) and Zaheer Shivji (Business Director)

2. Benefit Realization

Benefit Owner	
Business Unit(s)	Various
Technology Service / Solution	
Name	Supply Chain SAP
Measurement	
Period (e.g., quarterly)	N/A
Timing of submission	N/A
Reporting	
Reporting period	N/A
Report recipients	N/A

3. Monitored Outcomes

3.1. Benefit ID #5 – Cost – Spend reduction through active contract and supplier management

Outcomes

Benefit #	Description	Time Frame	Type
5	Better ability to manage contracts, suppliers and spend on an ongoing basis to ensure anticipated contract benefits are fully realized, do not erode and are increased over time. Supplier-related costs will be reduced due to active contract and supplier management enabled by SCA capabilities which provide more visibility, management and control over spend, contract terms and supplier performance; and by refocusing additional resources on these activities that are freed up through effort savings created by other benefit areas. Examples of SCA capabilities include: conformance to contract terms through outline agreements with 'locked pricing', management of milestone payments, better visibility of contract spend to ensure compliance to appropriate contracts, more efficient and reliable access to the signed contracts and amendments, matching of service and material acceptance with invoice information to ensure payment only of work and materials delivered, ERS that allows to pay without invoice while still supporting early payment discounts, ability to track discounts and rebates, ability to monitor and measure contract fulfillment and supplier performance, reports that provide data-based knowledge for decisions and actions.	Long Term (5 years)	Cost (Reduction and Avoidance)

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
5	**Benefit Details** BC Hydro's current systems have limited functionality to capture contract details for Business Groups across the company to enable active contract and supplier management. As a result, efforts are currently expended on manually gathering information. Reduced manual efforts from gathering information	Savings through active contract and supplier management	Using a baseline of $2.14 billion in addressable spend (managed through procurement process), a reduction of 1.5 per cent is achievable via supplier spend reduction	$16.1 M annual benefit value

	through the use of spreadsheets will be redirected to actively manage contracts and suppliers. With SCA functionality, it is expected these efforts to be repurposed to actively managing contracts and suppliers and therefore mitigate current value leakage due to missed discount terms, non-compliance to contracted rates and terms, overage charge due to rework or unjustified change orders. In addition, current systems also do not support understanding and tracking spend and supplier performance. As a result information that could be used to identify, target and track opportunities for improvement is unavailable. With SCA functionality, and focused resources as above, more detailed and more readily accessible information on spend and supplier performance will be available to support analysis and then action opportunities that will drive benefits. **SCA Design Considerations** Use of outline agreements to capture contracts as well as use of material and service masters to capture itemized services will enable BC Hydro to track progress on work and contract compliance. Use of these SCA elements will enable electronic tracking of contracted terms to mitigate leakage through non-compliance. There will also be a number of operational reports and improved data analysis available through BW to enable more effective management of Contract Expiration, Measure of Non-Compliance with Contract Terms, Measure of Missed Discount Terms, Measure Number of Change Order that Exceeds Contract Price and Spend by Outline Agreement along with a Supplier Relationship Management dashboard that will provide timely and quality information for more active management.		through active contract and supplier management. The savings estimate percentage applied is just below the mid-point of the benchmarked range for a PwC study on contract management and contract value leakage (non-compliance).	

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually

How measured	The benefit will be calculated as the difference between what is forecasted to occur given the SCA solution versus an estimate of what would have occurred without the SCA solution.
	BC Hydro will calculate the benefit forecasted for a given spend category 'action' or 'intervention' or combination of actions. This could be things such as but not limited to the following: a contract negotiation or renegotiation, the consolidation or redirection of spend onto the most appropriate contract, the realization of a benefit included in the contract (i.e., discount or better pricing), a beneficial change in supplier requirements, improvement in supplier performance. Benefits will be reported for each spend category. Financial benefits will be classified as either OMA or Capital based on what type of work the category supports within BC Hydro. For example 'Power Transformers' category is used for replacements or new substations, which is 100% capital. Consequently benefits calculated related to the Power Transformers category will be assumed to be 100% capital.
	For each 'action' or 'intervention', BC Hydro will also estimate how much of the benefit would have eroded overtime or would not have been possible without the SCA solution (Benefit Erosion/Unlikely or Missed Opportunities estimate). Given the extreme limitations in the current system, and industry information that indicates benefits either do not materialize or erode without the systems to provide visibility, control and active management, BC Hydro expects that the estimates for benefit erosion/unlikely or missed opportunities without SCA solution will be significant.
	The portion of the forecasted benefits from spend category actions/interventions that would likely have eroded or not been possible without SCA will be recorded as a benefit of the SCA Project.
	BC Hydro will also monitor key metrics (below are examples) that will indicate that the SCA solution is working as intended and driving contract value leakage and other sources of forecasted benefit erosion/unlikely or missed opportunities to near zero.
	Contract Value Leakage
	• Measure POs with no reference to contracts –
	  ○ BW report – SAP provides a message to user asking that they reference PO upon creation, if they decline to provide a reference analysis would be required to determine whether an actual contract exists
	• Measure value of change orders exceeding the contracted price –
	  ○ BW report – version control exists on contracts–analysis comparing versions of contracts will help identify contract leakage
	• Measure of Spend per Outline agreement –
	  ○ BW report
	• Measure of Spend without Outline Agreement
	  ○ BW report
	• Measure missed discount terms –
	  ○ BW report – Some discount term data is loaded into SAP and will provide a

	reference to measure against. Report will be developed to evaluate spend against a threshold or milestone which will require manual intervention to adjust master data to reflect newly discounted terms. Analysis of report will be required depending on discount and its relationship to reportable master data. • Measure non-compliance of contracted rates – ○ BW Report - SAP provides system enforced compliance on most spend channels assuring price compliance. SAP also will prevent users from exceeding total outline agreement value. Risk to contract non-compliance exists on two PO types (Flexible PO & Limit PO). On these two PO types some evaluation of a BW report will be required to evaluate non-compliance.
Other Assumptions	System based measurement is limited to terms with associated developed master-data including quality inspections, date-driven terms, quantity-driven terms. Volume related reporting can be used as a manual trigger to update terms.
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Increased use of material and service masters • Use of outline agreements • Correct selection of appropriate spend channels (PO's) • Effective change order process • Effective Contract Management and Supplier Relationship Management including KPIs
	Are there any key issues or risks related to this contribution? • Training and change management contributes to the acceptance and successful implementation of the new processes
IT Contributions	• Systematic compliance tracking • Systematic notifications for contract dates and values • Automated performance measurement scorecards
	Are there any key issues or risks related to this contribution? None identified at this time

3.2. Benefit ID #26 – Effort – Reduced effort to approve invoices

Outcomes

Benefit #	Description	Time Frame	Type
26	SCA will provide visibility to contract unit prices, enabling reduced manual effort across the Business Groups on invoice reconciliation and approvals.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
26	**Benefit Details** Manual effort reduction is expected from streamlining invoice reconciliation and approach for service invoices. These invoices were matched and approved manually before SCA was implemented. Automated reconciliation will reduce Business Groups' efforts in administering and approving invoices. **SCA Design Considerations** SCA will enable the use of 3-way match for services by leveraging service entry sheets and outline agreement functionality. Where appropriate ERS will be enabled to eliminate the need for an invoice to be generated by the vendor or processed by BC Hydro. ERS will enable full automation	Time required to approve service entry sheets	Benefits were estimated based on a forecast of 109,996 service invoices. Service invoices currently require on average 46 minutes to process and approve. With SCA, this effort will be redirected to the review and approval of Service Entry Sheets that are estimated to take 31 minutes on average to complete due to increased visibility of data (an estimated effort savings of 15 minutes per invoice).	$2.3 M annual benefit value

	of invoice processing (requirement for purchase orders (**POs**), volume/value accuracy and better vendor master data). SCA will streamline the process to resolve invoices that cannot be immediately processed via matching.			

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	Annually
How measured	• A study of the time and effort was completed on invoice approvals in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort to complete service entry sheets to determine the net benefit in time savings per transaction. Time reduction comparison will also need to include those transactions which have been completely automated as a time reduction. • Reports will be used to analyze the volume of Service Entry Sheets and Invoices paid during each reporting period.
Other Assumptions	• The Service Entry Sheet process will be required for all service vendors for the foreseeable future.

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	*How is it going?* See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Increased use of material and service master will increase 3-way match volume • Utilization of Outline Agreement and minimization of free text or non-contracted procurement methods • Timely use of Service Entry Sheets when work is completed
	Are there any key issues or risks related to this contribution? None identified at this time

IT Contributions	• Where applicable, ERS functionality will eliminate need of invoice to be generated and processed by BC Hydro • Systematic routing for Service Entry Sheet approval notifications and reminders for approvals
	Are there any key issues or risks related to this contribution? None identified at this time

3.3. Benefit ID #7 – Effort – Reduction of effort in operations managing completion of work

Outcomes

Benefit #	Description	Time Frame	Type
7	Management of contracted work completion was done manually by many people in Business Groups across BC Hydro (outside of Supply Chain). SCA will significantly reduce the effort to manage contracted work completion and provide systematic visibility to track, approve, and report on transactions recording work completion against contracts.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
7	**Benefit Details** SCA will provide the platform for contract details to be captured. These details can then be transacted through service entry sheet function by either BC Hydro personnel or the vendor directly, as work is completed to capture work completion on a timely, itemized basis in one system (**SAP**). **SCA Design Considerations** Use of outline agreements to capture contracts as well as use of service masters to	Further analysis determined that the realization of this benefit cannot be reliably measured due to the highly distributed and variable nature of the benefit among all users of the solution.	Approximately 4,000 people work in PassPort performing supply chain functions. It is estimated that 50 per cent of them are involved in downstream activities (managing contracts and suppliers) and spend 10 per cent of their annual effective time (1,586 hours) managing contracts. A conservative estimate is that 30 per cent of their time (~4 hours per month per person) is inefficient.	$4.0 M annual benefit value

	capture itemized services entries will enable BC Hydro to track work completion in detail. Use of these SCA elements will provide for real-time availability of work completion information in the system and therefore reduce manual efforts to track, approve, and report on transactions recording work completion resulting in efficiency gains.			

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	N/A
How measured	• The realization of this benefit cannot be reliably measured due to the highly distributed and variable nature of the benefit among all users of the solution.
Other Assumptions	• Although the realization of this benefit cannot be reliably measured, BC Hydro believes the benefit and its estimated value are still valid.

Measure – ***(Most of this section is not applicable until post implementation and will be updated at that time)***	
Measured Date	[YYYY-MM-DD}
Measured By	N/A
Metric Type	**N/A**
Performance toward achieving target	[On Track | Off Track]
Suggested Corrective action(s)	N/A
Suggested Opportunistic action(s)	N/A
Comments	N/A a

Business Contributions	• Documented standardized process for contract management • Use of vendor management templates
	Are there any key issues or risks related to this contribution? • Timely entry of service entry sheets
IT Contributions	
	Are there any key issues or risks related to this contribution? • None identified at this time

3.4. Benefit ID #14 – Cost – Reduction of cost of capital through an increase in inventory turns

Outcomes

Benefit #	Description	Time Frame	Type
14	The lack of need date accuracy and visibility to material demand at BC Hydro necessitated higher stock levels to deliver high material availability and expected service levels. Integration between work management scheduling and SAP, coupled with new demand management tools will allow for the establishment of planned independent requirements, will improve demand visibility and will enable improved inventory planning, increase inventory turns and therefore reduce the cost of capital.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
14	**Benefit Details** Materials Management carries large safety stock levels to support planned and unplanned work. BC Hydro's inventory turns are below industry average which results in higher carrying costs. Visibility to materials requirements is key to improve inventory planning to optimize inventory levels. Lowering inventory levels (while maintaining acceptable service levels) will reduce cost of capital tied up in inventory. SCA will enable work management, procurement and materials management functions to work collaboratively to	Inventory turns	The current inventory turn metric for active stock materials is 1.21. This translates to $160 M of active stock on hand. Assuming a 4 per cent carrying cost, this results in baseline carrying costs of $6.3 M per year. By improving the inventory turn metric to 2.79, savings of $2.7 M can be captured.	$2.7 M annual benefit value

	provide more visible and accurate demand signals as an input into the material requirements planning (**MRP**) process. This will help get the right materials to the right location at the right time, resulting in improved inventory turns. **SCA Design Considerations** Work management and material management integration, coupled with forecasting and material resource planning functionality will enable enhanced inventory planning and optimize the inventory levels to fulfill the desired service levels. SAP reporting will help planners set and adjust safety stock levels to appropriate levels to minimize risk of stockouts due to short planned and unplanned work. Needs dates generated by work management will allow accurate generation of demand signal and update speed of MRP will reduce offsets to compensate for manual planning cycles. Various inventory reports - including inventory aging report, inventory usage reports - will provide additional tools for better management that will improve inventory turns.			

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Track inventory turns and inventory value for active stock materials - ○ BW & Standard Report • Compare inventory turns to established SCA target and determine saving by multiplying inventory valuation differences by carrying cost for inventory.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD

Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Better planning to improve the inventory turns. • Consistent use of need dates by different parts of the business • Need date updates per schedule • Scheduling process based on the inventory availability
	Are there any key issues or risks related to this contribution? • Planning accuracy by work management and projects to feed MRP process
IT Contributions	• Inventory usage reports to measure inventory turns • Report for - need date vs issue date • Report for cancelled reservations – will ensure the overstock is tracked
	Are there any key issues or risks related to this contribution? None identified at this time

3.5. Benefit ID #29 – Effort – Reduction of efforts in manually performing accruals

Outcomes

Benefit #	Description	Time Frame	Type
29	The prior system did not allow for recording of work completion that has not yet been invoiced, and accurate purchasing documents were not created for service-based spend, significant manual effort was required to post and process accruals across Business Groups. Automation of this process will be enabled by SCA, resulting in a reduction of efforts.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
29	**Benefit Details** Before SCA was implemented, people across Business Groups were required to manually identify and provide amounts for invoices to be accrued for the work completed that has not yet been invoiced to	Effort reduced by eliminating, reducing or automating accruals; unapproved service entry	Benefits were estimated based on a forecast of 77,231 invoice accruals annually. Invoice accruals currently require an average of 41 minutes per invoice	$2.6 M annual benefit value

	ensure timely recording of expenditures against cost centers and projects. SCA will eliminate the need to track accruals manually where service entry sheets are used. Reports will be generated to assist with accruals for not yet accepted/approved service entry sheets. **SCA Design Considerations** SCA delivers the ability to produce a significantly higher percentage of detailed purchasing documentation. The combined use of outline agreements, PR's, PO's with service entry sheets will allow for more detailed recording of work and project completion that has not yet been invoiced. Depending on the stage of work completion and approvals, invoice processing becomes much more timely eliminating the need for accruals, in situations where work approvals delay the posting of transactions, reporting is available through SCA to auto-calculate a significantly higher percentage of the remaining approvals. This functionality reduces the effort required to quantify accruals.	sheets and non-PO invoices	accrued to identify and reconcile. With SCA, this effort will be eliminated as unapproved service entry sheets and non-PO invoices will be automatically accrued. If any residual effort is required, this will offset the savings and will need to be measured in future state.	

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	Annually
How measured	• Effort reduction/elimination generating accruals ○ A self-report study of the time and effort was completed on invoice accruals in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on invoice accruals to determine the net benefit in time savings per accrual. • # Accruals automated versus # Accruals manual
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard

Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	None identified at this time
	Are there any key issues or risks related to this contribution? • Change Management – adoption of service entry sheets by vendor and business units
IT Contributions	• Provide report to show accruals required for invoice for un-received/unapproved Service Entry Sheets.
	Are there any key issues or risks related to this contribution? None identified at this time

3.6. Benefit ID #105 – Effort – Reduction in project forecasting effort

Outcomes

Benefit #	Description	Time Frame	Type
105	The monthly schedule progression represents a large component of the Project Delivery Monthly Project Reporting process. SAP will be the future source of truth for contract related information and is available to all resources involved in monthly forecasting. Business Warehouse reporting capabilities will enable a significant time reduction across the many parties who perform these activities.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
105	**Benefit Details** Project Managers (**PjM**), Work Package Managers (**WPM**), Schedulers (**Schd**), Cost Analysts (**CA**), Contract Professionals (**CP**), Program Managers (**PgM**), Program Techs (**PT**) spend significant time on project forecasting. It is estimated that approximately 30 minutes per role per active project or	Number of active projects and programs versus time spent on project forecasting	The number of active projects and programs across BC Hydro that include a forecasting effort is approximately 588. The current project forecasting effort for the roles involved are as follows:	$1.1 M annual benefit value

	program per month will be reduced by the implementation of SCA project. This benefit is delivered through being able to leverage SAP as the one source of truth for contract and spend related information. SAP BW based reporting will significantly streamline these efforts. **SCA Design Considerations** Linkage between Outline Agreements, subsequent Purchase Orders, and the associated Projects and Network Activities will allow for effective reporting of commitments, delivery to date, and actual spend to date. This information can be summarized and reported through Business Warehouse (**BW**) by the SCA system for analysis by employees involved in project forecasting activity.		CIPD PjM 97min CIPD WPM 97min CIPD Schd 114min CIPD CA 50min CIPD CP 54min PCM PgM 327min PCM PjM 180min PCM WPM 180min PCM PT 360min With SCA, it is estimated that an average of 30 minutes per role will be saved on forecasting per project per month.	

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	Annually
How measured	• Measure number of active projects and programs • A self-report study of the time and effort was completed on project and program forecasting in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on project and program forecasting to determine the net benefit in time savings per active project or program.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Utilization of Outline agreements and purchase orders at the required detail level to eliminate or reduce monthly manual reporting

	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Automated transactions and reporting contribute to increased information availability and report generation
	Are there any key issues or risks related to this contribution? None identified at this time

3.7. Benefit ID #102 – Cost – Improved excess project material visibility

Outcomes

Benefit #	Description	Time Frame	Type
102	Many projects executed at BC Hydro order specific materials to meet construction requirements without a catalogue ID. This creates challenges with tracking items through the supply chain and reduces the visibility required to conduct Materials Management transactions. This can result in significant challenges for the Supply Chain and reduces the visibility for BC Hydro to reuse this material for future projects. SCA will provide functionality so that all the material handled by Materials Management will require a material ID to enable visibility of all stocked material.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
102	**Benefit Details** There are a number of transactions including quality inspection, warehouse management and spares that are dependent upon a catalogue identifier that SCA will enable. SCA will provide the platform for inventory records to be created, materials tracked and returns executed. Project stock will segregate project specific materials, thereby reducing the risk of inadvertent deployment to other projects. Previously, a separate database (Staging tool) was maintained to track this material with a	The realization of this benefit will be measured by tracking project materials returned to inventory in a separate category (ZGNC) in SAP and tracking the later reissuance of these materials for future use.	The total amount of material in the Staging tool less than 6 months is $544,046. Total estimated one year inventory is 2 x's $544,046 = $1.1 M. This is the total estimated value of purchased material that could be used by other projects due to non-stock material visibility with SCA.	$0.8 M annual benefit value

	value of $17 M that does not have a materials catalogue identifier assigned. This non-catalogue database was not integrated with PassPort creating challenges in searching for the free text materials. Potential project delays and reschedules occur due to materials with no transactional information resulting in potential loss of critical information and limited visibility to material availability. **SCA Design Considerations** Use of project stock and material master data will allow for the identification of all materials stored for consumption by projects. Increased utilization of master data records will aid in identifying materials not consumed by projects and transitioning them for redeployment. Standard material masters will be used for standard stock materials enabling return for redeployment. Visibility will also exist for materials with a shelf-life to improve opportunities for preservation when project delays occur or with any use of first in first out (**FIFO**) management.			

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Material Returns value from projects ○ BW Reports will provide visibility to reclamation of project stock as well as subsequent issue to other projects and programs.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Increased use of Material masters • Validation of appropriate reorder points for each material • On time return of excess material from the projects
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Report showing overstock material. i.e. material with no demand and on hand in excess of reorder point • Report showing material returns from the projects • Report showing material returns redeployed to other projects
	Are there any key issues or risks related to this contribution? None identified at this time

3.8. Benefit ID #67 – Effort – Reduced efforts to develop scope of work via service catalogue

Outcomes

Benefit #	Description	Time Frame	Type
67	Previously, there was no ability to look up a list of standard services, so the scope of work for purchase requisitions had to be manually defined and sent to Procurement. SCA will provide standard catalogues to reduce effort for the end users across the business units to develop scopes of work.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
67	**Benefit Details** SCA will result in a reduction of effort to create scopes of work involving services. In prior practice, all the	Time required to develop scope of	There were 10,750 service transactions in F19, and 40 per cent of those are for simple	$595.8 K annual benefit value

	scopes of work were generated manually by the end users across the Business Groups and captured as 'free text'. SCA allows the use of a service catalogue allowing users to reuse commonly purchased service specifications to reduce effort on defining scopes of work. This benefit is focused on time saved for the end users in the business for defining scope of work. **SCA Design Considerations** Use of outline agreements as well as use of a service catalogue for commonly used services will enable users to create requisitions against pre-existing contracts and rates. A service catalogue provides detailed specifications for the services which in turn can be used to develop scope of work.	work using service catalogue	services that could be requested through a catalogue. A requester can reduce its efforts by estimated 1.75 hours (defining and approving the scope of work for each CO).	

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	Annually
How measured	• A self-report study of the time and effort was completed on developing the scope of work for simple services in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on developing a scope of work from services included in the service catalogue to determine the net benefit in time savings per order initiated from the service catalogue. •
Other Assumptions	• This will require analysis from BW data by analyst

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard

Comments	See scorecard
Business Contributions	• Use of Service Catalogue to develop scope of work • Develop service masters with adequate details with proper specifications so that they can be used to develop scope of work
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.9. Benefit ID #2 – Effort – Streamline the purchasing process via PO automation

Outcomes

Benefit #	Description	Time Frame	Type
2	SCA will increase the level of automation in PO processing, and thus reduce the effort required by the Supply Chain team on manual POs. This is enabled by the use of SCA functionalities such as MRP, material/service masters, and contract records.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
2	**Benefit Details** Material POs with material master that have contracted pricing in place initiated from the MRP (through inventory planning and use of material reservation) can be automated. Service POs with service master and contracted price can also be automated. This will reduce the number of POs to be processed manually resulting in savings due to effort reduction. **SCA Design Considerations** SCA will enable PO automation for materials and services. POs with specific material and service masters that are tied to the contracted pricing can be automated. Ability to automate PO services will reduce the effort required compared to the current functionality in PassPort.	Time spent to process PO (for POs that can be automated), volume of automated orders and number of outline agreements set up for automatic release	As estimate of 1,500 material POs annually, requiring 2.2 hours each to process in the current state will be automated by leveraging contracted pricing stored within the system. Additionally, an estimate of 2,700 service COs annually, requiring 0.4 hours each to process in the current state will be automated with SCA through the use of service masters and contracts.	$378.4 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at –Year 4
When measured	Annually

How measured	• Track time spent to process POs
	  ○ A self-report study of the time and effort was completed on the process to complete material and service orders in the per-SCA state to establish a baseline performance that will be compared to future studies of time and effort on material and service orders to determine the net benefit in time savings per order that is automated in the future.
	• Measure and track number of POs automated. Consideration will be given to the number automated orders per outline agreement in the future state vs the number of manual orders per agreement in the previous state to ensure the realization of the benefit is accurately calculated.
	  ○ Volume of automated orders processed
	  ○ Outline agreements setup for auto-release

Other Assumptions	• The pre-SCA average order-to-contract ratio per year is 40.7 for materials and 9.6 for services.

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Assist setting appropriate min/max for material with contracted pricing • Increased usage of service master for frequently used services with contracted pricing
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.10. Benefit ID #16 – Effort – Eliminate manual material reservations at Material Management

Outcomes

Benefit #	Description	Time Frame	Type
16	There was no direct link between work orders, projects and material reservations. Integration of these components will reduce effort to manually collect and input information into the system. Materials Management will have accurate visibility of upcoming work orders to better manage demand, plan resources and actively manage reorder points.	Long Term (4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**

16	**Benefit Details** In prior state, work scheduling accuracy required Materials Management to adjust work order need dates. This manual effort required employees to interface with various stakeholder groups across BC Hydro that had materials needs for projects and maintenance work. SCA will have a direct link between work orders, projects, and material reservations which is anticipated to reduce the manual efforts required by demand planners. It will also allow for automatic updates to the need dates (previously performed manually), where any rescheduled work orders will update the need dates through to the material reservations. Warehouse operations will have visibility to the upcoming work orders. **SCA Design Considerations** SCA will provide easy access to existing schedules through work management/material management integration that allows for updated need dates to carry through the system (synchronized dates between work orders and material reservations). The manual work-arounds and efforts will be reduced while also improving accuracy of material delivery schedules.	Reduction in FTE positions	Currently, 2 FTEs (demand validators) are performing this function at MMBU, spending 1,586 hours each. With SCA, this effort will no longer be required. Additionally, 3 FTEs (field store keepers) are performing this function, spending 1,461 hours each. With SCA, this effort will no longer be required. This benefit assumes a standard labour rate for the demand validators ($62.47/hr) and field store keepers ($53.49/hr) based on BCH SLRs by area.	$432.6 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 2 years 100 per cent Benefit at – Year 4
When measured	Annually
How measured	• Confirmation of positions eliminated
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard

Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	*Accurate need dates to be entered and maintained by Operations when scheduling work.*
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.11. Benefit ID #104 – Cost – Reduction in inventory obsolescence write-offs

Outcomes

Benefit #	Description	Time Frame	Type
104	Obsolescence is a factor in any complicated supply chain. Design changes, material changes, project cancellations, ordering errors are all contributors to accumulated obsolescence. Effective Inventory management and demand planning is critical to reduce the exposure to obsolescence. SCA will enable improved demand planning and forecasting capabilities to be used in conjunction with MRP to reduce the financial impact of obsolescence on BC Hydro.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
104	**Benefit Details** The average annual write-off of inventory from fiscal 2016 to fiscal 2019 was $1.1 M. The impact to BC Hydro is that there are OMA costs associated with writing materials off in the event they are no longer required. This is because of the overstock due to demand and supply planning, change in the specification, project delays, unprocessed recall and defects and design changes to projects. SCA will enable tools to support improved demand planning, supply planning, materials management and returns. These tools will assist in enabling visibility and required changes in business processes to ensure better planning, notifications and recalls are managed effectively. **SCA Design Considerations** SCA provides a comprehensive inventory and planning platform. Increased use of master data and transaction compliance will increase visibility to inventory levels throughout BC Hydro's extended supply chain allowing for increased opportunities for redeployment and reductions in obsolescence. Adoption of leading master data governance practices will be a key enabler in driving visibility to achieve this benefit. Adoption of leading master data governance practices including establishing material masters for all materials flowing through BC Hydro distribution channels will be a key enabler in providing visibility to achieve this benefit.	Reduction in inventory obsolescence	The average annual write-off of inventory from fiscal 2016 to fiscal 2019 was $1.1 M. At 50 per cent realization ratio, total cost avoidance of $546,000 has been estimated.	$546.0 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Obsolescence write offs per year/Change in Dead Stock – ○ Standard & BW reports
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• Better demand planning will reduce obsolete inventory • Managing engineering changes with integration with MMBU
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Report for inventory with no usage in three years
	Are there any key issues or risks related to this contribution? None identified at this time

3.12. Benefit ID #103 – Cost – Improved Reel Return Management

Outcomes

Benefit #	Description	Time Frame	Type
103	Management of wire-core reel returns has historically been a challenge for BC Hydro as Materials Management did not track the reels used to transport wire and cables throughout the system. $400 K of reels does not get returned for credit from vendors annually resulting in a write-off and lost opportunity. SCA will enable the tracking for wire-core reels allowing for identification of business areas not returning these products and opportunities to expedite the return or re-train employees to improve the process.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
103	**Benefit Details** In prior system, in the absence of system tracking, it was difficult to validate where the cores were located without manual count and verification throughout the 60+ locations. This lack of visibility made it challenging for BC Hydro to work with vendors and reconcile outstanding cores that can be returned for credit. SCA enables a perpetual tracking system for cores that would greatly improve visibility on these items. Cores will be provided a Cat ID and will be tracked in the system allowing BC Hydro to determine exactly where each reel is located. This will greatly increase the probability of a reel being returned and BC Hydro being able to collect the deposit. Better tracking will improve the return rate and provide visibility of the reels in the system. **SCA Design Considerations** SCA will provide a process and system capabilities to track wire core reels throughout their lifecycle. Each wire core reel will be issued to end-users and will be expected to be returned within a reasonable time frame (end of project, completion of job, completion of certain number of jobs). Record of issue will allow for tracking and expediting of reels for credit, holding third-party contractors accountable for return (if appropriate), or retraining to assure they come back in the future.	Dollars of reels returned/% of reels returned/Write-offs of reels	Previously, wire core reels worth $400,000 were written off annually due to the inability to locate the wire reels. SCA will create visibility and tracking of the reels for returns that will eliminate the $400,000 write-off per year.	$400.0 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Measure write-offs of reels (at time of physical inventory) • Measure number of reel returns to vendor • Measure % of reels returned compared to total inventory ○ Standard and BW reports with limited analysis
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	See scorecard
Suggested Corrective action(s)	See scorecard
Suggested Opportunistic action(s)	See scorecard
Comments	See scorecard
Business Contributions	• On time returns of the reels • Increased visibility of reels
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Reels issued to the work orders with no returns
	Are there any key issues or risks related to this contribution? None identified at this time

Benefit Tracking Form

Supply Chain Applications

1. Project

Project Information	
Project Name	Supply Chain Applications Project
Project Description	Implementation of Supply Chain Applications
Project ID	YT-00486
Project In-Service Date	August 4, 2020
Project Participants	
Sponsor	David Wong
Initiator	Gurjit Parmar
Project Manager	Hugh Smith (Project Director) and Zaheer Shivji (Business Director)

2. Benefit Realization

Benefit Owner	
Business Unit(s)	Various
Technology Service / Solution	
Name	Supply Chain SAP
Measurement	
Period (e.g., quarterly)	N/A
Timing of submission	N/A
Reporting	
Reporting period	N/A
Report recipients	N/A

3. Monitored Outcomes

3.1. Benefit ID #5 – Cost – Spend reduction through active contract and supplier management

Outcomes

Benefit #	Description	Time Frame	Type
5	Better ability to manage contracts, suppliers and spend on an ongoing basis to ensure anticipated contract benefits are fully realized, do not erode and are increased over time. Supplier-related costs will be reduced due to active contract and supplier management enabled by SCA capabilities which provide more visibility, management and control over spend, contract terms and supplier performance; and by refocusing additional resources on these activities that are freed up through effort savings created by other benefit areas. Examples of SCA capabilities include: conformance to contract terms through outline agreements with 'locked pricing', management of milestone payments, better visibility of contract spend to ensure compliance to appropriate contracts, more efficient and reliable access to the signed contracts and amendments, matching of service and material acceptance with invoice information to ensure payment only of work and materials delivered, ERS that allows to pay without invoice while still supporting early payment discounts, ability to track discounts and rebates, ability to monitor and measure contract fulfillment and supplier performance, reports that provide data-based knowledge for decisions and actions.	Long Term (5 years)	Cost (Reduction and Avoidance)

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
5	**Benefit Details** BC Hydro's current systems have limited functionality to capture contract details for Business Groups across the company to enable active contract and supplier management. As a result, efforts are currently expended on manually gathering information. Reduced manual efforts from gathering information	Savings through active contract and supplier management	Using a baseline of $2.14 billion in addressable spend (managed through procurement process), a reduction of 1.5 per cent is achievable via supplier spend reduction	$16.1 M annual benefit value

	through the use of spreadsheets will be redirected to actively manage contracts and suppliers. With SCA functionality, it is expected these efforts to be repurposed to actively managing contracts and suppliers and therefore mitigate current value leakage due to missed discount terms, non-compliance to contracted rates and terms, overage charge due to rework or unjustified change orders. In addition, current systems also do not support understanding and tracking spend and supplier performance. As a result information that could be used to identify, target and track opportunities for improvement is unavailable. With SCA functionality, and focused resources as above, more detailed and more readily accessible information on spend and supplier performance will be available to support analysis and then action opportunities that will drive benefits. **SCA Design Considerations** Use of outline agreements to capture contracts as well as use of material and service masters to capture itemized services will enable BC Hydro to track progress on work and contract compliance. Use of these SCA elements will enable electronic tracking of contracted terms to mitigate leakage through non-compliance. There will also be a number of operational reports and improved data analysis available through BW to enable more effective management of Contract Expiration, Measure of Non-Compliance with Contract Terms, Measure of Missed Discount Terms, Measure Number of Change Order that Exceeds Contract Price and Spend by Outline Agreement along with a Supplier Relationship Management dashboard that will provide timely and quality information for more active management.		through active contract and supplier management. The savings estimate percentage applied is just below the mid-point of the benchmarked range for a PwC study on contract management and contract value leakage (non-compliance).	

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually

How measured	The benefit will be calculated as the difference between what is forecasted to occur given the SCA solution versus an estimate of what would have occurred without the SCA solution.
	BC Hydro will calculate the benefit forecasted for a given spend category 'action' or 'intervention' or combination of actions. This could be things such as but not limited to the following: a contract negotiation or renegotiation, the consolidation or redirection of spend onto the most appropriate contract, the realization of a benefit included in the contract (i.e., discount or better pricing), a beneficial change in supplier requirements, improvement in supplier performance. Benefits will be reported for each spend category. Financial benefits will be classified as either OMA or Capital based on what type of work the category supports within BC Hydro. For example 'Power Transformers' category is used for replacements or new substations, which is 100% capital. Consequently benefits calculated related to the Power Transformers category will be assumed to be 100% capital.
	For each 'action' or 'intervention', BC Hydro will also estimate how much of the benefit would have eroded overtime or would not have been possible without the SCA solution (Benefit Erosion/Unlikely or Missed Opportunities estimate). Given the extreme limitations in the current system, and industry information that indicates benefits either do not materialize or erode without the systems to provide visibility, control and active management, BC Hydro expects that the estimates for benefit erosion/unlikely or missed opportunities without SCA solution will be significant. The portion of the forecasted benefits from spend category actions/interventions that would likely have eroded or not been possible without SCA will be recorded as a benefit of the SCA Project.
	BC Hydro will also monitor key metrics (below are examples) that will indicate that the SCA solution is working as intended and driving contract value leakage and other sources of forecasted benefit erosion/unlikely or missed opportunities to near zero.
	Contract Value Leakage
	• Measure POs with no reference to contracts –
	  ○ BW report – SAP provides a message to user asking that they reference PO upon creation, if they decline to provide a reference analysis would be required to determine whether an actual contract exists
	• Measure value of change orders exceeding the contracted price –
	  ○ BW report – version control exists on contracts–analysis comparing versions of contracts will help identify contract leakage
	• Measure of Spend per Outline agreement –
	  ○ BW report
	• Measure of Spend without Outline Agreement
	  ○ BW report
	• Measure missed discount terms –
	  ○ BW report – Some discount term data is loaded into SAP and will provide a

	reference to measure against. Report will be developed to evaluate spend against a threshold or milestone which will require manual intervention to adjust master data to reflect newly discounted terms. Analysis of report will be required depending on discount and its relationship to reportable master data. • Measure non-compliance of contracted rates – ○ BW Report - SAP provides system enforced compliance on most spend channels assuring price compliance. SAP also will prevent users from exceeding total outline agreement value. Risk to contract non-compliance exists on two PO types (Flexible PO & Limit PO). On these two PO types some evaluation of a BW report will be required to evaluate non-compliance.
Other Assumptions	System based measurement is limited to terms with associated developed master-data including quality inspections, date-driven terms, quantity-driven terms. Volume related reporting can be used as a manual trigger to update terms.
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~{ On Track | Off Track }~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• Increased use of material and service masters • Use of outline agreements • Correct selection of appropriate spend channels (PO's) • Effective change order process • Effective Contract Management and Supplier Relationship Management including KPIs
	Are there any key issues or risks related to this contribution? • Training and change management contributes to the acceptance and successful implementation of the new processes
IT Contributions	• Systematic compliance tracking • Systematic notifications for contract dates and values • Automated performance measurement scorecards
	Are there any key issues or risks related to this contribution? None identified at this time

3.2. Benefit ID #26 – Effort – Reduced effort to approve invoices

Outcomes

Benefit #	Description	Time Frame	Type
26	SCA will provide visibility to contract unit prices, enabling reduced manual effort across the Business Groups on invoice reconciliation and approvals.	Long Term (~~3~~ 4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
26	**Benefit Details** Manual effort reduction is expected from streamlining invoice reconciliation and approach for service invoices. These invoices were matched and approved manually before SCA was implemented. Automated reconciliation will reduce Business Groups' efforts in administering and approving invoices. **SCA Design Considerations** SCA will enable the use of 3-way match for services by leveraging service entry sheets and outline agreement functionality. Where appropriate ERS will be enabled to eliminate the need for an invoice to be generated by the vendor or processed by BC Hydro. ERS will enable full automation	Time required to approve service entry sheets	Benefits were estimated based on a forecast of 109,996 service invoices. Service invoices currently require on average 46 minutes to process and approve. With SCA, this effort will be redirected to the review and approval of Service Entry Sheets that are estimated to take 31 minutes on average to complete due to increased visibility of data (an estimated effort savings of 15 minutes per invoice).	$2.3 M annual benefit value

	of invoice processing (requirement for purchase orders (**POs**), volume/value accuracy and better vendor master data). SCA will streamline the process to resolve invoices that cannot be immediately processed via matching.			

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	Annually
How measured	• A study of the time and effort was completed on invoice approvals in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort to complete service entry sheets to determine the net benefit in time savings per transaction. Time reduction comparison will also need to include those transactions which have been completely automated as a time reduction. • Reports will be used to analyze the volume of Service Entry Sheets and Invoices paid during each reporting period.
Other Assumptions	• The Service Entry Sheet process will be required for all service vendors for the foreseeable future.

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	*How is it going?* ~~[On Track | Off Track]~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• Increased use of material and service master will increase 3-way match volume • Utilization of Outline Agreement and minimization of free text or non-contracted procurement methods • Timely use of Service Entry Sheets when work is completed
	Are there any key issues or risks related to this contribution? None identified at this time

IT Contributions	• Where applicable, ERS functionality will eliminate need of invoice to be generated and processed by BC Hydro • Systematic routing for Service Entry Sheet approval notifications and reminders for approvals
	Are there any key issues or risks related to this contribution? None identified at this time

3.3. Benefit ID #7 – Effort – Reduction of effort in operations managing completion of work

Outcomes

Benefit #	Description	Time Frame	Type
7	Management of contracted work completion was done manually by many people in Business Groups across BC Hydro (outside of Supply Chain). SCA will significantly reduce the effort to manage contracted work completion and provide systematic visibility to track, approve, and report on transactions recording work completion against contracts.	Long Term (~~3~~ 4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
7	**Benefit Details** SCA will provide the platform for contract details to be captured. These details can then be transacted through service entry sheet function by either BC Hydro personnel or the vendor directly, as work is completed to capture work completion on a timely, itemized basis in one system (**SAP**). **SCA Design Considerations** Use of outline agreements to capture contracts as well as use of service masters to	Further analysis determined that the realization of this benefit cannot be reliably measured due to the highly distributed and variable nature of the benefit among all users of the solution.	Approximately 4,000 people work in PassPort performing supply chain functions. It is estimated that 50 per cent of them are involved in downstream activities (managing contracts and suppliers) and spend 10 per cent of their annual effective time (1,586 hours) managing contracts. A conservative estimate is that 30 per cent of their time (~4 hours per month per person) is inefficient.	$4.0 M annual benefit value

	capture itemized services entries will enable BC Hydro to track work completion in detail. Use of these SCA elements will provide for real-time availability of work completion information in the system and therefore reduce manual efforts to track, approve, and report on transactions recording work completion resulting in efficiency gains.			

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	N/A
How measured	• The realization of this benefit cannot be reliably measured due to the highly distributed and variable nature of the benefit among all users of the solution.
Other Assumptions	• Although the realization of this benefit cannot be reliably measured, BC Hydro believes the benefit and its estimated value are still valid.

Measure – ***(Most of this section is not applicable until post implementation and will be updated at that time)***	
Measured Date	[YYYY-MM-DD}
Measured By	N/A
Metric Type	**N/A**
Performance toward achieving target	[On Track | Off Track]
Suggested Corrective action(s)	N/A
Suggested Opportunistic action(s)	N/A
Comments	N/A a

Business Contributions	• Documented standardized process for contract management • Use of vendor management templates
	Are there any key issues or risks related to this contribution? • Timely entry of service entry sheets
IT Contributions	
	Are there any key issues or risks related to this contribution? • None identified at this time

3.4. Benefit ID #14 – Cost – Reduction of cost of capital through an increase in inventory turns

Outcomes

Benefit #	Description	Time Frame	Type
14	The lack of need date accuracy and visibility to material demand at BC Hydro necessitated higher stock levels to deliver high material availability and expected service levels. Integration between work management scheduling and SAP, coupled with new demand management tools will allow for the establishment of planned independent requirements, will improve demand visibility and will enable improved inventory planning, increase inventory turns and therefore reduce the cost of capital.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
14	**Benefit Details** Materials Management carries large safety stock levels to support planned and unplanned work. BC Hydro's inventory turns are below industry average which results in higher carrying costs. Visibility to materials requirements is key to improve inventory planning to optimize inventory levels. Lowering inventory levels (while maintaining acceptable service levels) will reduce cost of capital tied up in inventory. SCA will enable work management, procurement and materials management functions to work collaboratively to	Inventory turns	The current inventory turn metric for active stock materials is 1.21. This translates to $160 M of active stock on hand. Assuming a 4 per cent carrying cost, this results in baseline carrying costs of $6.3 M per year. By improving the inventory turn metric to 2.79, savings of $2.7 M can be captured.	$2.7 M annual benefit value

	provide more visible and accurate demand signals as an input into the material requirements planning (**MRP**) process. This will help get the right materials to the right location at the right time, resulting in improved inventory turns. **SCA Design Considerations** Work management and material management integration, coupled with forecasting and material resource planning functionality will enable enhanced inventory planning and optimize the inventory levels to fulfill the desired service levels. SAP reporting will help planners set and adjust safety stock levels to appropriate levels to minimize risk of stockouts due to short planned and unplanned work. Needs dates generated by work management will allow accurate generation of demand signal and update speed of MRP will reduce offsets to compensate for manual planning cycles. Various inventory reports - including inventory aging report, inventory usage reports - will provide additional tools for better management that will improve inventory turns.			

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Track inventory turns and inventory value for active stock materials - ○ BW & Standard Report • Compare inventory turns to established SCA target and determine saving by multiplying inventory valuation differences by carrying cost for inventory.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard
Measured By	TBD

Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• Better planning to improve the inventory turns. • Consistent use of need dates by different parts of the business • Need date updates per schedule • Scheduling process based on the inventory availability
	Are there any key issues or risks related to this contribution? • Planning accuracy by work management and projects to feed MRP process
IT Contributions	• Inventory usage reports to measure inventory turns • Report for - need date vs issue date • Report for cancelled reservations – will ensure the overstock is tracked
	Are there any key issues or risks related to this contribution? None identified at this time

3.5. Benefit ID #29 – Effort – Reduction of efforts in manually performing accruals

Outcomes

Benefit #	Description	Time Frame	Type
29	The prior system did not allow for recording of work completion that has not yet been invoiced, and accurate purchasing documents were not created for service-based spend, significant manual effort was required to post and process accruals across Business Groups. Automation of this process will be enabled by SCA, resulting in a reduction of efforts.	Long Term (~~3~~ 4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
29	**Benefit Details** Before SCA was implemented, people across Business Groups were required to manually identify and provide amounts for invoices to be accrued for the work completed that has not yet been invoiced to	Effort reduced by eliminating, reducing or automating accruals; unapproved service entry	Benefits were estimated based on a forecast of 77,231 invoice accruals annually. Invoice accruals currently require an average of 41 minutes per invoice	$2.6 M annual benefit value

	ensure timely recording of expenditures against cost centers and projects. SCA will eliminate the need to track accruals manually where service entry sheets are used. Reports will be generated to assist with accruals for not yet accepted/approved service entry sheets. **SCA Design Considerations** SCA delivers the ability to produce a significantly higher percentage of detailed purchasing documentation. The combined use of outline agreements, PR's, PO's with service entry sheets will allow for more detailed recording of work and project completion that has not yet been invoiced. Depending on the stage of work completion and approvals, invoice processing becomes much more timely eliminating the need for accruals, in situations where work approvals delay the posting of transactions, reporting is available through SCA to auto-calculate a significantly higher percentage of the remaining approvals. This functionality reduces the effort required to quantify accruals.	sheets and non-PO invoices	accrued to identify and reconcile. With SCA, this effort will be eliminated as unapproved service entry sheets and non-PO invoices will be automatically accrued. If any residual effort is required, this will offset the savings and will need to be measured in future state.	

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	Annually
How measured	• Effort reduction/elimination generating accruals ○ A self-report study of the time and effort was completed on invoice accruals in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on invoice accruals to determine the net benefit in time savings per accrual. • # Accruals automated versus # Accruals manual
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard

Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	None identified at this time
	Are there any key issues or risks related to this contribution? • Change Management – adoption of service entry sheets by vendor and business units
IT Contributions	• Provide report to show accruals required for invoice for un-received/unapproved Service Entry Sheets.
	Are there any key issues or risks related to this contribution? None identified at this time

3.6. Benefit ID #105 – Effort – Reduction in project forecasting effort

Outcomes

Benefit #	Description	Time Frame	Type
105	The monthly schedule progression represents a large component of the Project Delivery Monthly Project Reporting process. SAP will be the future source of truth for contract related information and is available to all resources involved in monthly forecasting. Business Warehouse reporting capabilities will enable a significant time reduction across the many parties who perform these activities.	Long Term (~~3~~ 4 years)	~~Cost~~Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
105	**Benefit Details** Project Managers (**PjM**), Work Package Managers (**WPM**), Schedulers (**Schd**), Cost Analysts (**CA**), Contract Professionals (**CP**), Program Managers (**PgM**), Program Techs (**PT**) spend significant time on project forecasting. It is estimated that approximately 30 minutes per role per active project or	Number of active projects and programs versus time spent on project forecasting	The number of active projects and programs across BC Hydro that include a forecasting effort is approximately 588. The current project forecasting effort for the roles involved are as follows:	$1.1 M annual benefit value

	program per month will be reduced by the implementation of SCA project. This benefit is delivered through being able to leverage SAP as the one source of truth for contract and spend related information. SAP BW based reporting will significantly streamline these efforts. **SCA Design Considerations** Linkage between Outline Agreements, subsequent Purchase Orders, and the associated Projects and Network Activities will allow for effective reporting of commitments, delivery to date, and actual spend to date. This information can be summarized and reported through Business Warehouse (**BW**) by the SCA system for analysis by employees involved in project forecasting activity.		CIPD PjM 97min CIPD WPM 97min CIPD Schd 114min CIPD CA 50min CIPD CP 54min PCM PgM 327min PCM PjM 180min PCM WPM 180min PCM PT 360min With SCA, it is estimated that an average of 30 minutes per role will be saved on forecasting per project per month.	

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	Annually
How measured	• Measure number of active projects and programs • A self-report study of the time and effort was completed on project and program forecasting in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on project and program forecasting to determine the net benefit in time savings per active project or program.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~[YYYY-MM-DD]~~See scorecard
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• Utilization of Outline agreements and purchase orders at the required detail level to eliminate or reduce monthly manual reporting

	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Automated transactions and reporting contribute to increased information availability and report generation
	Are there any key issues or risks related to this contribution? None identified at this time

3.7. Benefit ID #102 – Cost – Improved excess project material visibility

Outcomes

Benefit #	Description	Time Frame	Type
102	Many projects executed at BC Hydro order specific materials to meet construction requirements without a catalogue ID. This creates challenges with tracking items through the supply chain and reduces the visibility required to conduct Materials Management transactions. This can result in significant challenges for the Supply Chain and reduces the visibility for BC Hydro to reuse this material for future projects. SCA will provide functionality so that all the material handled by Materials Management will require a material ID to enable visibility of all stocked material.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
102	**Benefit Details** There are a number of transactions including quality inspection, warehouse management and spares that are dependent upon a catalogue identifier that SCA will enable. SCA will provide the platform for inventory records to be created, materials tracked and returns executed. Project stock will segregate project specific materials, thereby reducing the risk of inadvertent deployment to other projects. Previously, a separate database (Staging tool) was maintained to track this material with a	The realization of this benefit will be measured by tracking project materials returned to inventory in a separate category (ZGNC) in SAP and tracking the later reissuance of these materials for future use.	The total amount of material in the Staging tool less than 6 months is $544,046. Total estimated one year inventory is 2 x's $544,046 = $1.1 M. This is the total estimated value of purchased material that could be used by other projects due to non-stock material visibility with SCA.	$0.8 M annual benefit value

	value of $17 M that does not have a materials catalogue identifier assigned. This non-catalogue database was not integrated with PassPort creating challenges in searching for the free text materials. Potential project delays and reschedules occur due to materials with no transactional information resulting in potential loss of critical information and limited visibility to material availability. **SCA Design Considerations** Use of project stock and material master data will allow for the identification of all materials stored for consumption by projects. Increased utilization of master data records will aid in identifying materials not consumed by projects and transitioning them for redeployment. Standard material masters will be used for standard stock materials enabling return for redeployment. Visibility will also exist for materials with a shelf-life to improve opportunities for preservation when project delays occur or with any use of first in first out (**FIFO**) management.			

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Material Returns value from projects ○ BW Reports will provide visibility to reclamation of project stock as well as subsequent issue to other projects and programs.
Other Assumptions	

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~[YYYY-MM-DD]~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~ See scorecard
Suggested Corrective action(s)	~~N/A at this time~~ See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~ See scorecard
Comments	~~N/A at this time~~ See scorecard
Business Contributions	• Increased use of Material masters • Validation of appropriate reorder points for each material • On time return of excess material from the projects
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Report showing overstock material. i.e. material with no demand and on hand in excess of reorder point • Report showing material returns from the projects • Report showing material returns redeployed to other projects
	Are there any key issues or risks related to this contribution? None identified at this time

3.8. Benefit ID #67 – Effort – Reduced efforts to develop scope of work via service catalogue

Outcomes

Benefit #	Description	Time Frame	Type
67	Previously, there was no ability to look up a list of standard services, so the scope of work for purchase requisitions had to be manually defined and sent to Procurement. SCA will provide standard catalogues to reduce effort for the end users across the business units to develop scopes of work.	Long Term (~~3~~ 4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
67	**Benefit Details** SCA will result in a reduction of effort to create scopes of work involving services. In prior practice, all the	Time required to develop scope of	There were 10,750 service transactions in F19, and 40 per cent of those are for simple	$595.8 K annual benefit value

	scopes of work were generated manually by the end users across the Business Groups and captured as 'free text'. SCA allows the use of a service catalogue allowing users to reuse commonly purchased service specifications to reduce effort on defining scopes of work. This benefit is focused on time saved for the end users in the business for defining scope of work. **SCA Design Considerations** Use of outline agreements as well as use of a service catalogue for commonly used services will enable users to create requisitions against pre-existing contracts and rates. A service catalogue provides detailed specifications for the services which in turn can be used to develop scope of work.	work using service catalogue	services that could be requested through a catalogue. A requester can reduce its efforts by estimated 1.75 hours (defining and approving the scope of work for each CO).	

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	Annually
How measured	• A self-report study of the time and effort was completed on developing the scope of work for simple services in the pre-SCA state to establish a baseline performance that will be compared to future studies of time and effort on developing a scope of work from services included in the service catalogue to determine the net benefit in time savings per order initiated from the service catalogue. •
Other Assumptions	• This will require analysis from BW data by analyst

Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~{ On Track | Off Track }~~See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~ See scorecard

Comments	~~N/A at this time~~ See scorecard
Business Contributions	• Use of Service Catalogue to develop scope of work • Develop service masters with adequate details with proper specifications so that they can be used to develop scope of work
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.9. Benefit ID #2 – Effort – Streamline the purchasing process via PO automation

Outcomes

Benefit #	Description	Time Frame	Type
2	SCA will increase the level of automation in PO processing, and thus reduce the effort required by the Supply Chain team on manual POs. This is enabled by the use of SCA functionalities such as MRP, material/service masters, and contract records.	Long Term (~~3~~ 4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
2	**Benefit Details** Material POs with material master that have contracted pricing in place initiated from the MRP (through inventory planning and use of material reservation) can be automated. Service POs with service master and contracted price can also be automated. This will reduce the number of POs to be processed manually resulting in savings due to effort reduction. **SCA Design Considerations** SCA will enable PO automation for materials and services. POs with specific material and service masters that are tied to the contracted pricing can be automated. Ability to automate PO services will reduce the effort required compared to the current functionality in PassPort.	Time spent to process PO (for POs that can be automated), volume of automated orders and number of outline agreements set up for automatic release	As estimate of 1,500 material POs annually, requiring 2.2 hours each to process in the current state will be automated by leveraging contracted pricing stored within the system. Additionally, an estimate of 2,700 service COs annually, requiring 0.4 hours each to process in the current state will be automated with SCA through the use of service masters and contracts.	$378.4 K annual benefit value

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at –Year ~~3~~4
When measured	Annually

How measured	• Track time spent to process POs
	  ○ A self-report study of the time and effort was completed on the process to complete material and service orders in the per-SCA state to establish a baseline performance that will be compared to future studies of time and effort on material and service orders to determine the net benefit in time savings per order that is automated in the future.
	• Measure and track number of POs automated. Consideration will be given to the number automated orders per outline agreement in the future state vs the number of manual orders per agreement in the previous state to ensure the realization of the benefit is accurately calculated.
	  ○ Volume of automated orders processed
	  ○ Outline agreements setup for auto-release

Other Assumptions	• The pre-SCA average order-to-contract ratio per year is 40.7 for materials and 9.6 for services.
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~ See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~ See scorecard
Comments	~~N/A at this time~~ See scorecard
Business Contributions	• Assist setting appropriate min/max for material with contracted pricing • Increased usage of service master for frequently used services with contracted pricing
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.10. Benefit ID #16 – Effort – Eliminate manual material reservations at Material Management

Outcomes

Benefit #	Description	Time Frame	Type
16	There was no direct link between work orders, projects and material reservations. Integration of these components will reduce effort to manually collect and input information into the system. Materials Management will have accurate visibility of upcoming work orders to better manage demand, plan resources and actively manage reorder points.	Long Term (~~3~~4 years)	Effort

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**

16	**Benefit Details** In prior state, work scheduling accuracy required Materials Management to adjust work order need dates. This manual effort required employees to interface with various stakeholder groups across BC Hydro that had materials needs for projects and maintenance work. SCA will have a direct link between work orders, projects, and material reservations which is anticipated to reduce the manual efforts required by demand planners. It will also allow for automatic updates to the need dates (previously performed manually), where any rescheduled work orders will update the need dates through to the material reservations. Warehouse operations will have visibility to the upcoming work orders. **SCA Design Considerations** SCA will provide easy access to existing schedules through work management/material management integration that allows for updated need dates to carry through the system (synchronized dates between work orders and material reservations). The manual work-arounds and efforts will be reduced while also improving accuracy of material delivery schedules.	Reduction in FTE positions	Currently, 2 FTEs (demand validators) are performing this function at MMBU, spending 1,586 hours each. With SCA, this effort will no longer be required. Additionally, 3 FTEs (field store keepers) are performing this function, spending 1,461 hours each. With SCA, this effort will no longer be required. This benefit assumes a standard labour rate for the demand validators ($62.47/hr) and field store keepers ($53.49/hr) based on BCH SLRs by area.	$432.6 K annual benefit value

Tracking Plan	
When to occur	Stabilization – ~~1 year~~2 years 100 per cent Benefit at – Year ~~3~~4
When measured	Annually
How measured	• Confirmation of positions eliminated
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~{YYYY-MM-DD}~~See scorecard

Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~ See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	*Accurate need dates to be entered and maintained by Operations when scheduling work.*
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	
	Are there any key issues or risks related to this contribution? None identified at this time

3.11. Benefit ID #104 – Cost – Reduction in inventory obsolescence write-offs

Outcomes

Benefit #	Description	Time Frame	Type
104	Obsolescence is a factor in any complicated supply chain. Design changes, material changes, project cancellations, ordering errors are all contributors to accumulated obsolescence. Effective Inventory management and demand planning is critical to reduce the exposure to obsolescence. SCA will enable improved demand planning and forecasting capabilities to be used in conjunction with MRP to reduce the financial impact of obsolescence on BC Hydro.	Long Term (5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
104	**Benefit Details** The average annual write-off of inventory from fiscal 2016 to fiscal 2019 was $1.1 M. The impact to BC Hydro is that there are OMA costs associated with writing materials off in the event they are no longer required. This is because of the overstock due to demand and supply planning, change in the specification, project delays, unprocessed recall and defects and design changes to projects. SCA will enable tools to support improved demand planning, supply planning, materials management and returns. These tools will assist in enabling visibility and required changes in business processes to ensure better planning, notifications and recalls are managed effectively. **SCA Design Considerations** SCA provides a comprehensive inventory and planning platform. Increased use of master data and transaction compliance will increase visibility to inventory levels throughout BC Hydro's extended supply chain allowing for increased opportunities for redeployment and reductions in obsolescence. Adoption of leading master data governance practices will be a key enabler in driving visibility to achieve this benefit. Adoption of leading master data governance practices including establishing material masters for all materials flowing through BC Hydro distribution channels will be a key enabler in providing visibility to achieve this benefit.	Reduction in inventory obsolescence	The average annual write-off of inventory from fiscal 2016 to fiscal 2019 was $1.1 M. At 50 per cent realization ratio, total cost avoidance of $546,000 has been estimated.	$546.0 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year 5
When measured	Annually
How measured	• Obsolescence write offs per year/Change in Dead Stock – ○ Standard & BW reports
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~[YYYY-MM-DD]~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~ See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• Better demand planning will reduce obsolete inventory • Managing engineering changes with integration with MMBU
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Report for inventory with no usage in three years
	Are there any key issues or risks related to this contribution? None identified at this time

3.12. Benefit ID #103 – Cost – Improved Reel Return Management

Outcomes

Benefit #	Description	Time Frame	Type
103	Management of wire-core reel returns has historically been a challenge for BC Hydro as Materials Management did not track the reels used to transport wire and cables throughout the system. $400 K of reels does not get returned for credit from vendors annually resulting in a write-off and lost opportunity. SCA will enable the tracking for wire-core reels allowing for identification of business areas not returning these products and opportunities to expedite the return or re-train employees to improve the process.	Long Term (~~3~~ 5 years)	Cost

Expected Benefits and Tracking Plan

Expected Benefit				
#	**Description**	**Metric**	**Baseline**	**Target**
103	**Benefit Details** In prior system, in the absence of system tracking, it was difficult to validate where the cores were located without manual count and verification throughout the 60+ locations. This lack of visibility made it challenging for BC Hydro to work with vendors and reconcile outstanding cores that can be returned for credit. SCA enables a perpetual tracking system for cores that would greatly improve visibility on these items. Cores will be provided a Cat ID and will be tracked in the system allowing BC Hydro to determine exactly where each reel is located. This will greatly increase the probability of a reel being returned and BC Hydro being able to collect the deposit. Better tracking will improve the return rate and provide visibility of the reels in the system. **SCA Design Considerations** SCA will provide a process and system capabilities to track wire core reels throughout their lifecycle. Each wire core reel will be issued to end-users and will be expected to be returned within a reasonable time frame (end of project, completion of job, completion of certain number of jobs). Record of issue will allow for tracking and expediting of reels for credit, holding third-party contractors accountable for return (if appropriate), or retraining to assure they come back in the future.	Dollars of reels returned/% of reels returned/Write-offs of reels	Previously, wire core reels worth $400,000 were written off annually due to the inability to locate the wire reels. SCA will create visibility and tracking of the reels for returns that will eliminate the $400,000 write-off per year.	$400.0 K annual benefit value

Tracking Plan	
When to occur	Stabilization – 1 year 100 per cent Benefit at – Year ~~3~~5
When measured	Annually
How measured	• Measure write-offs of reels (at time of physical inventory) • Measure number of reel returns to vendor • Measure % of reels returned compared to total inventory ○ Standard and BW reports with limited analysis
Other Assumptions	
Measure – ***(Most of this section is not applicable until actual measurement is conducted and reported post implementation and will be updated at that time)***	
Measured Date	~~[YYYY-MM-DD]~~See scorecard
Measured By	TBD
Metric Type	**Quantitative** | Qualitative
Performance toward achieving target	~~[On Track | Off Track]~~ See scorecard
Suggested Corrective action(s)	~~N/A at this time~~See scorecard
Suggested Opportunistic action(s)	~~N/A at this time~~See scorecard
Comments	~~N/A at this time~~See scorecard
Business Contributions	• On time returns of the reels • Increased visibility of reels
	Are there any key issues or risks related to this contribution? None identified at this time
IT Contributions	• Reels issued to the work orders with no returns
	Are there any key issues or risks related to this contribution? None identified at this time

BC Hydro
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Benefits Realization Annual Report No. 1

F2021

Appendix B

Benefits Measurement Scorecard

Appendix B – Benefits Measurement Scorecard

The template below will be used for annual reporting on progress on the benefit realization plan

MONETIZED BENEFITS ('000)

NOTES:
1. This section provides information on the **tracked monetized benefits**, in particular - the overall targets, annual targets as well as the annual results. Annual target and actual benefit amounts (in FTE and $) represent the aggregate value built up from previous years and the reported year. For example, for year F26, the target 20 FTEs are planned to be reduced during years F23 (1FTE), F24 (+9 FTE), F25 (+8 FTEs), F26 (+2 FTEs).
2. All **cost benefits** are monetized and therefore the amounts of the monetized and quantified cost benefits are the same in the 'Tracked monetized benefis' and 'Tracked expected quantified benefits' sections of this scorecard.
3. Effort benefits are monetized where effort reductions are significant and concentrated to a small group and result in elimination of a net 20 Full Time Eployee (FTEs) with a $2.6 M/year target per year.

Benefit		Realization Time	Measured	Target Benefit	F22		F23		F24		F25		F26		F27	
Type	Description				Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Effort	Monetized effort benefits in Full Time Employee 'FTE'	4 years	Annually	20 FTE	N/A		1 FTE	-	10 FTE	-	18 FTE	-	20 FTE	-	20 FTE	-
	Monetized effort benefits in $			$ 2,617	N/A		$ 164	-	$ 1,309	-	$ 2,453	-	$ 2,617	-	$ 2,617	-
Cost	Monetized cost benefits in $	5 years	Annually	$ 20,512	$ 638		$ 5,128	-	$ 10,256	-	$ 15,384	-	$ 19,872	-	$ 20,512	-

TRACKED EXPECTED QUANTIFIED BENEFITS ('000)

NOTES:
1. This section provides information on the expected quantified benefits that BC Hydro will be measuring and tracking, in particular - the overall targets, annual targets as well as the annual results. Annual target and actual amounts represent the aggregate value built up from previous years and the reported year
2. All quantified **cost benefits** are monetized and the same as included in the monetized benefits section above.
3. Effort benefits are quantified by assessing the savings on employee time per year in hours and dollars. Effort reduction benefits are not necessarily linked directly to a headcount reduction, but rather it is the cumulative reduction from all effort benefits combined that will enable the headcount reduction and therefore the actual annual results for the quantified and monetized benefits may differ.

Benefit			Realization Time	Measured	Target Benefit	F22		F23		F24		F25		F26		F27	
#	Type	Description				Projected Estimate	Actual	Projected Estimate	Actual	Projected Estimate	Actual	Projected Estimate	Actual	Projected Estimate	Actual	Projected Estimate	Actual
2	effort	Streamline the purchasing process via PO automation	4 years	Annually	$ 346	N/A		$ 22	-	$ 173	-	$ 324	-	$ 346	-	$ 346	-
16	effort	Eliminate manual material reservations at MM			$ 433	N/A		$ 27	-	$ 217	-	$ 406	-	$ 433	-	$ 433	-
26	effort	Reduced effort to approve invoices			$ 2,305	N/A		$ 144	-	$ 1,153	-	$ 2,161	-	$ 2,305	-	$ 2,305	-
29	effort	Reduction of efforts in performing manual accruals			$ 2,632	N/A		$ 164	-	$ 1,316	-	$ 2,467	-	$ 2,632	-	$ 2,632	-
67	effort	Reduced efforts to develop scope of work via service catalogue			$ 596	N/A		$ 37	-	$ 298	-	$ 559	-	$ 596	-	$ 596	-
105	effort	Reduction in project forecasting effort			$ 1,125	N/A		$ 70	-	$ 562	-	$ 1,055	-	$ 1,125	-	$ 1,125	-
		Total tracked quantified EFFORT			**$ 7,437**	**N/A**		**$ 465**	-	**$ 3,718**	-	**$ 6,972**	-	**$ 7,437**	-	**$ 7,437**	-
5	cost	Reduced cost due to Active Contract & Supplier Mngmt	5 years	Annually	$ 16,073	$ 502	-	$ 4,018	-	$ 8,037	-	$ 12,055	-	$ 15,571	-	$ 16,073	-
14	cost	Reduction of cost of capital through an increase in inventory turns			$ 2,677	$ 84	-	$ 669	-	$ 1,339	-	$ 2,008	-	$ 2,593	-	$ 2,677	-
102	cost	Improved excess project material visibility			$ 816	$ 26	-	$ 204	-	$ 408	-	$ 612	-	$ 791	-	$ 816	-
103	cost	Improved reel return management			$ 400	$ 13	-	$ 100	-	$ 200	-	$ 300	-	$ 388	-	$ 400	-
104	cost	Reduction in inventory obsolescence write-offs			$ 546	$ 13	-	$ 137	-	$ 273	-	$ 410		$ 530	-	$ 546	-
		Total COST			**$ 20,512**	**$ 638**	-	**$ 5,128**	-	**$ 10,256**	-	**$ 15,384**	-	**$ 19,872**	-	**$ 20,512**	-
		TOTAL TRACKED EXPECTED QUANTIFIED Cost & Effort			**$ 27,949**	**$ 638**	-	**$ 5,593**	-	**$ 13,974**	-	**$ 22,356**	-	**$ 27,308**	-	**$ 27,949**	
		BENEFITS NOT TRACKED Effort			**$ 5,423**	**$ 5,423**	-	**$ 5,423**	-	**$ 5,423**	-	**$ 5,423**	-	**$ 5,423**	-	**$ 5,423**	-
		GRAND TOTAL - EXPECTED BENEFITS Cost & Effort			**$ 33,372**	**$ 6,061**	-	**$ 11,016**	-	**$ 19,397**	-	**$ 27,779**	-	**$ 32,731**	-	**$ 33,372**	

Benefits Realization Scorecard – Discussion & Analysis

Monetized Benefits

Benefit Type	Comments
Effort	Include comments on any variance between target and actual for monetized effort benefits (on a combined basis).
Cost	Include comments on any variance between target and actual for monetized cost benefits (on a combined basis).

Tracked Expected Quantified Benefits

Benefit #	Comments
2	Include comments for individual benefits (as applicable): Reasons for variance between target and actual (if any) Corrective/opportunistic actions
16	
26	
29	
67	
105	
5	
14	
102	
103	
104	