

Integrated Program Review 2

Commercial Operations Follow Up

Posted 2/24/17



Evolution to a roadmap

- **2012 – First SCED internal assessment**
 - Based on BPA's understanding of SPP EIS (e.g. generic EIM/SCED).
 - Extensive cross agency engagement.
- **2014 – Second SCED internal assessment**
 - Built upon first internal assessment.
 - Based on BPA's understanding of the NWPP SCED.
- **2015 – Post SCED assessment**
 - Built upon previous assessments.
 - Look at investments that maximize value absent joining a SCED.
- **2017 – Long-term roadmap (in progress)**
 - Built upon the foundation of all earlier work.
 - Based on BPA's view of the changing marketplace.
 - Informed by a respected industry expert and EIM integrator.

Between 2010 and 2015, BPA spent \$6 million on the first three bulleted items. These costs were all internal and would not be considered incremental as defined in the 2/16 presentation.

Efforts Approved for FY 18 - 19

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate
Program Management	BPA staff and contractors responsible for supporting the development of program projects (pre-proposal, proposal, project) tracking deliverables and ensuring work is completed within budget and on time.	ALL	\$2m - \$4m
Marketing and Settlements System Project	Replace the failing ISO bidding and settlement platforms, enable efficient EIM settlements for transfer load and surplus sales, and add marketing data analysis capabilities.	5, 10, 11	\$2m - \$4m
Generation Outage Tracking System Project	Improves communication and coordination between FCRPS entities, increasing reliability. Aids in coordinating maintenance schedules and transmission limitations in accordance with increasing daily activity. Enhances BPA's ability to comply with NERC reporting requirements and thus reduces risk of fines.	5, 7, 10, 11	\$2m - \$4m

- Approved efforts for FY 18-19 are expected to represent \$5M of the commercial operations budget.

Candidate Foundational and Modernization Projects

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
Operational Data Re-architecture	<p>Purpose: Develop a data architecture with proper governance that is accessible across the agency.</p> <p>Benefit: Increase flexibility and access to data from core business systems.</p>	1, 2, 3, 5, 9, 11	\$2m-\$4m	50%
Operational Network Modeling Coordination and Enhancements	<p>Purpose: Improve BPA's network model systems and processes to ensure accuracy and consistency across the agency and region.</p> <p>Benefits: Improve reliability, consistency and efficiency of network model systems and processes within BPA and among WECC transmission providers.</p>	3, 10	\$1m -\$2m	40%
Transmission Modeling Strategy	<p>Purpose: Develop a roadmap and implementation plan that envisions BPA using consistent and reliable power flow and dynamic models which enable better planning, operational, and commercial decision making.</p> <p>Benefits: Improved efficiency and accuracy of BPA's system modeling capabilities.</p>	1, 2, 10, 11	\$1m– 2m	50%

Candidate Foundational and Modernization Projects (continued)

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
BPA and CAISO Coordinated Transmission Agreement Implementation Project	<p>Purpose: Implement tools and data exchanges for more effective congestion management practices, controls and visualizations.</p> <p>Benefits: Precise, effective and price informed congestion management of EIM flows on BPA flowgates.</p>	1, 2, 3, 11	\$2m-\$4m	100%
Operational State Awareness Tools	<p>Purpose: Enhance situational awareness of system conditions for BPA operators.</p> <p>Benefits: Increase real time transparency of system flows and other constraints for more accurate and measured response to system conditions.</p>	1, 2, 3, 5, 11	\$2m-\$4m	60%
System Operating Limits Calculation Enhancements	<p>Purpose: Create operating limits that are informed by real time and forecasted data.</p> <p>Benefit: The transmission system in studied state more often. More timely and proactive information, more accurate curtailments and increase confidence in ATC values.</p>	1, 11	\$1m-\$2m	100%

Candidate Foundational and Modernization Projects (continued)

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
<p>Products, Services and Inventory Development</p>	<p>Purpose: BPA transmission products and services align with market conditions, regulatory obligations, and price signals for system expansion and usage. BPA establishes risk metrics relative to inventory and study assumptions for transmission ATC calculations.</p> <p>Benefits: BPA's infrastructure investment would be fully utilized providing rate stability and greater customer satisfaction. It would also send proper price signals to future participants who request transmission expansion for their future needs. Inventory would be made available consistent with sound utility practices and regulatory obligations.</p>	<p>1, 2, 5, 11</p>	<p>\$5m-\$10m</p>	<p>70%</p>
<p>One BPA Outage Management</p>	<p>Purpose: Outage needs are coordinated as far in advance as possible and managed to specific criteria to allow them to proceed with continual assessment and communication of certainty, providing maximum value to BPA safety, planning and operations.</p> <p>Benefits: Fewer outage moves, more effective sequencing of work, increased efficiency, better program execution (more work done, under budget), improved collaboration (business line integration), more lead time to manage risk, and improved outage duration accuracy</p>	<p>1, 11</p>	<p>\$2m-\$4m</p>	<p>100%</p>

Candidate Foundational and Modernization Projects (continued)

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
End Use Load Research Project	<p>Purpose: Update end use load shape data for residential and commercial buildings.</p> <p>Benefits: End use load data provides input data that is critical to understanding the future loads and impacts on BPA's system. It also provides information needed to target demand-side solutions to solve transmission and power needs.</p>	11	\$1m-\$2m	100%
Enhanced Forecasting Tools Project	<p>Purpose: Improve load forecasting including conservation impacts, wind forecasting, solar forecasting and hydrological expectations. May also expand forecasting to additional adjoining.</p> <p>Benefits: More accurate modeling of load, wind error, solar error and hydro expectations allow BPA to better manage uncertainty in river and transmission system operations. Better forecasting of market opportunities enables BPA capitalize and increase secondary revenue.</p>	1, 2, 3, 5, 7, 9, 10	\$500k-1m	40%
DTC Calculation Improvements	<p>Purpose: Develop methods and tools to calculate real time dynamic transfer capabilities and commercial variable transfer limits.</p> <p>Benefits: Improved reliability and potential improved commercial access to dynamic transfer capabilities.</p>	1, 2, 3, 5	\$500k-\$1m	50%

Candidate Foundational and Modernization Projects (continued)

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
Data Science and Analytics	<p>Purpose: Build data reservoirs with supporting analytical tools, techniques, visualizations and pipelines that make big data more accessible and meaningful.</p> <p>Benefits: More efficient analysis of commercial and operations information, more timely data informed decision making, lower technology costs, reliable data storage, scalable compute resources, reduced maintenance overhead, improved ability to deliver its products to customers and increased workforce productivity for all variety of data practitioners.</p>	1, 2, 3, 5, 7, 9, 10, 11	\$1m-\$2m	100%
Enhancements to Scheduling and Curtailment tools	<p>Purpose: BPA's scheduling and curtailment systems and processes are standardized, consistent with industry best practices and designed to manage increasing volume and complexity in response to changing industry requirements.</p> <p>Benefit: Standard systems are more robust, able to efficiently adjust to changing requirements and improve ability to deliver products to customers. Systems are consistent between scheduling and operations and manual processes are limited.</p>	1, 3, 5	\$500k-1m	75%

Candidate EIM Optionality Projects

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
Benefit Analysis Studies	<p>Purpose: Estimate the qualitative and quantitative benefits of market opportunities.</p> <p>Benefits: Decisions on how to engage with the markets are informed by analytics.</p>	ALL	\$500k-\$1m	100%
New Markets Engagement Project	<p>Purpose: Engage with the EIM and potential Western ISO to ensure BPA's positions are included in stakeholder processes.</p> <p>Benefits: BPA is in the best position to meet preference customer loads, maximize power and transmission revenues to anticipate any necessary systems and process changes that result from market evolution.</p>	4, 5, 6, 8, 9, 10	\$500k-1m	100%
Additional EMS and AGC functionality	<p>Purpose: Develop tactical EMS and AGC changes to support increased interaction with the EIM.</p> <p>Benefits: Ability to support automated implementation of directions from the EIM.</p>	2, 3, 5, 7, 10, 11	\$500k-\$1m	20%
Additional Applications for Market Participation	<p>Purpose: BPA will need the tools and applications necessary to engage with emerging markets.</p> <p>Benefits: As opportunities for additional participation in the emerging markets arise, BPA will be able to capitalize on those opportunities.</p>	5, 10	\$2m-5m	20%

Candidate EIM Optionality Projects (cont.)

Project Name	Purpose and Benefit	Risk ID's	Cost Estimate	BP18 % Complete Estimate
Enhanced Data Management, Analytics and Integration	<p>Purpose: Create centralized data management capabilities.</p> <p>Benefit: BPA is able to accommodate increased volume and frequency of data and provide quality analytics capabilities.</p>	ALL	\$2m-\$5m	40%
Training and Change Management for modified business functions	<p>Purpose: Equip BPA staff to operate safely and reliably in a rapidly changing environment.</p> <p>Benefits: Staff has the knowledge and equipment necessary to execute BPA's future business model.</p>	ALL	\$500k-\$1m	15%

- FY 18-19 represent roughly half of the total expected commercial operations program costs.

Financial Disclosure

- This information was made publicly available on February 24, 2017, and contains information not sourced directly from BPA financial statements.