



Bonneville Power Administration

Final Report



Asset Management

Enterprise Process Improvement Project

January 17, 2006



Bonneville Power Administration

This information is being released externally by BPA on April 21, 2006, as analysis generated for BPA's Enterprise Process Improvement Program (EPIP) studies. Although baselines were sourced from the Financial System, they do not track directly back to official financial statements. In some instances subsequent analysis was performed to better represent the particular scope of the process being



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Bonneville Power Administration





1. Executive Summary

Since its creation through the Bonneville Project Act of 1937, Bonneville Power Administration (BPA) has played an important role in the Pacific Northwest managing the power and transmission facilities of the Federal Columbia River Power System (FCRPS). As the region's population and economy have grown, BPA's role has also grown. In addition to fulfilling its mandate to maintain system reliability, BPA has been required to play an active part in promoting rate equity, environmental protection, and the development of conservation and renewable resources.

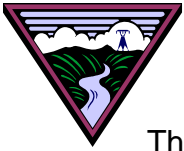
The specific means by which BPA manages its assets have been shaped by numerous pieces of legislation and regulatory prescriptions (e.g. Bonneville Project Act, Environmental Protection Act, Transmission Act, Regional Act, etc.). These have changed over time and different portions of BPA policy and operations have been modified in response. These modifications have sometimes been applied to the Agency as a whole, but at other times, to specific portions (i.e. the major asset areas – hydro, Columbia Generating Stations (CGS), transmission, Information Technology (IT), Energy Efficiency (EE), Fish and Wildlife (F&W), and buildings). Accordingly, current asset management practices have been implemented at different times for different categories of assets and reflect the priorities of the time they were implemented. Although each asset area may manage their assets successfully, they do not necessarily subscribe to common visions, policies, implementation strategies, or methodologies.

The purpose of the Enterprise Process Improvement Project (EPIP) Asset Management (AM) Study is to provide a recommendation for an integrated Agency AM Framework that can be applied **consistently** and **effectively** across all asset areas. This Framework should reflect industry best practices but also be adapted or tailored to BPA's specific characteristics and regulatory requirements. The specific goal of the AM EPIP gave the team a mandate to recommend a repeatable process for managing the physical assets of the FCRPS in a way that is beneficial to the Agency and informative to stakeholders.

Goal of the Asset Management EPIP

Demonstrate to ourselves and our stakeholders/customers that BPA has a transparent repeatable process for effectively managing the physical assets of the FCRPS.

- **Ensure that asset-related decisions advance strategic goals**
 - **Make better decisions**
 - **Use resources efficiently**
 - **Improve communications**

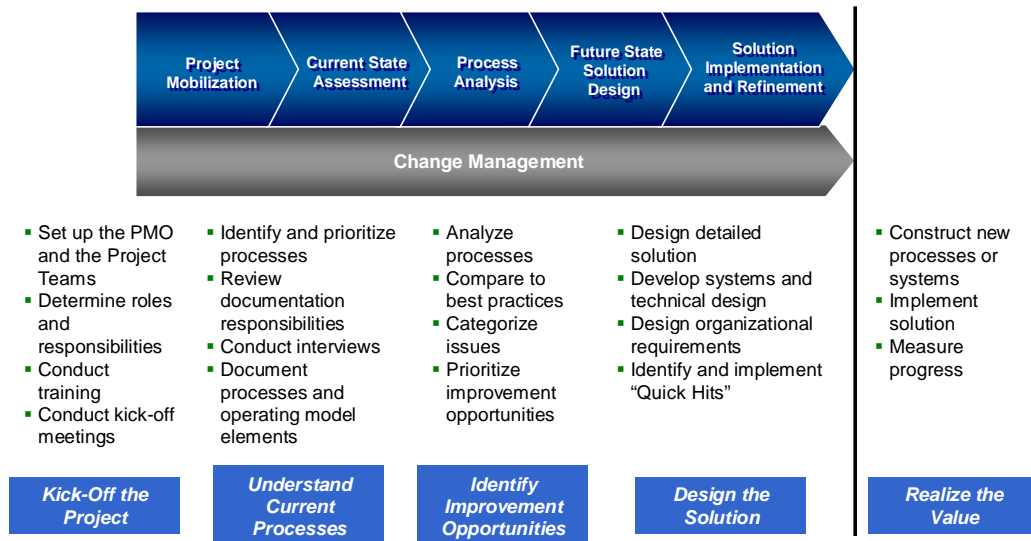


The EPIP AM Team was comprised of members from each of the Business Lines (BL) (including Corporate) who gathered information from managers and subject matter experts in seven distinct areas where BPA has responsibility for the management of capital assets: hydro generation, CGS, transmission, F&W, EE, IT, and buildings.

The EPIP team applied KEMA’s tailored approach to achieving excellence. This EPIP methodology was adapted to the objectives associated with asset management questions at BPA. The steps included organizing around the concepts of asset management, researching and analyzing the current state of asset management at BPA, exploring best practices in the industry, identifying differences between industry best practice and BPA’s practices, and developing a set of recommendations to address the priorities for change. An overview of the team process is shown in Figure 1.1, KEMA’s Tailored Approach to Achieving Excellence in Asset Management.

Figure 1.1

KEMA’s Tailored Approach to Achieving Excellence in Asset Management



AM is defined as the systematic and coordinated activities and practices through which BPA optimally manages its physical assets, and the associated performance, risks, and expenditures over the asset’s life cycle for the purpose of achieving the objectives of BPA’s strategic plan. For the purpose of the team’s analysis, AM was divided into 12 elements: policy, strategy, information management, risk management, legal/regulatory requirements, corporate objectives, condition and performance targets, asset plans, financial planning, operations implementation, emergency preparedness, and



continuous improvement. The result of the team's research on the current state was a description of how each of the asset categories addresses the 12 functions of AM.

Current State of Asset Management at BPA

A general finding of this initial stage of inquiry was that each of the seven asset areas does manage its assets successfully. However, the different asset categories display widely disparate levels of explicitness, detail, and sophistication in their treatment of different phases of the AM process. Furthermore, the different asset categories show varying degrees of alignment with regard to each of the elements of AM. For instance, for some groups, financial planning involves a detailed assessment of future financial needs based upon anticipated consequences and their likelihood of occurrence. The consequences that are considered are explicitly linked to stated policy, strategy, and perceived risk. At the other extreme, financial planning may simply be an exercise in fitting tasks or projects to available budgets with minimal strategic guidance or anticipation of potential changes in the operating environment.

The Agency clearly has a wide variety of approaches and processes for AM. This is due to a variety of factors including the diverse objectives embodied in authorizing statutes, the need to collaborate with other organizations on asset-related questions, and the internal dynamics associated with individual program needs. The net effect of all these forces is a diverse, unaligned collection of approaches with little commonality across the organization.

Asset Management Best Practices

The past decade has seen substantial evolution in the utility companies' approach to managing physical assets. Among the changes are a more tightly defined set of criteria for making asset-related decisions, greater specificity around roles and responsibilities for asset planning and care, and tighter linkage between the assets and the strategic objectives of the organization. The result of this evolution is a set of practices that has come to be called "asset management."

The "best practices" model or framework for AM displays the following characteristics. It is:

- **Holistic** in its orientation, leading to appropriate decisions for the organization as a whole as expressed in its goals and strategies, rather than sub-optimizing for individual asset areas.
- **Systematic** in application and transparently methodical, repeatable, and auditable.
- **Systemic** in outlook, viewing assets as a system rather than in isolation,
- **Structured** so that roles and responsibilities are clear and management control is integrated,
- **Risk-based** and oriented towards priorities appropriate for the identified risks,

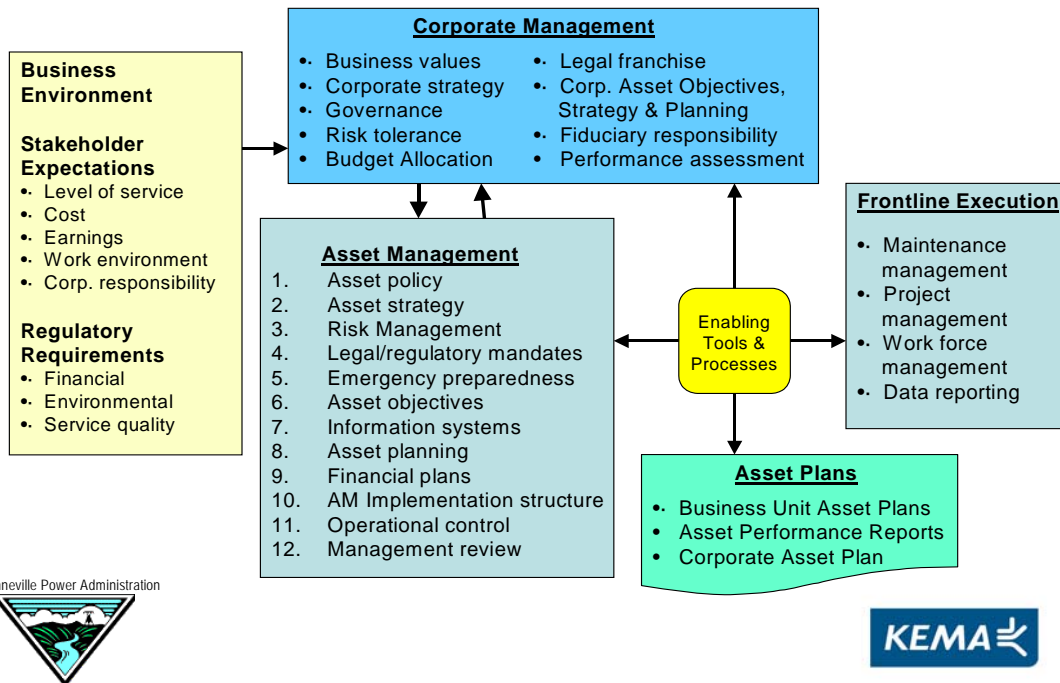


- **Optimal**, embodying the best trade-off among performance, cost, and risk over the asset life cycle, and
- **Sustainable**, characterized by achievable levels of service delivery, capital spending, and Operation and Maintenance (O&M) over time.
- **Process driven** requiring loyalty to one process that cuts across organizational units.

Figure 1.2 shows the structure of a corporate AM system. It distinguishes between the external drivers (business environment and stakeholders), corporate management setting policy and strategy, AM focusing on planning and analysis, and frontline execution. The “best practices” model integrates AM throughout an organization by creating functional alignment between successive stages in the treatment of assets and methodological consistency across the various types of assets

Figure 1.2

A Corporate Framework for Asset Management



Modern AM is described by the 12 functional elements comparable to those used to assess the current state. Adhering to the best practices in each of these functional elements will create a documented and repeatable sequence of steps that will optimize asset-related decisions and actions across the organization. “Best practice” AM occurs when an organization creates an AM structure and has a clearly defined, organization-wide **policy** that is translated into a **strategy** to guide actions. This strategy accommodates **legal, regulatory, and other requirements** and takes into account **risk**



identification, assessment and management efforts. The directions set by the strategy inform the more specific **objectives** and condition and performance **targets** that are used to render asset plans and related financial planning actionable. These plans guide implementation and **operational control** efforts that contain **emergency preparedness** provisions to deal with numerous, varied contingencies that can be anticipated if not forecast with reliability or accuracy. **Information management** systems are designed to support the analytical demands of tracking, aggregating, and analyzing data necessitated by the strategy guidance and represented concretely in asset and financial planning. A final management review and **continuous improvement** step completes the AM cycle while simultaneously setting the stage for the next round of efforts.

Gap Analysis

Gap analysis was used by the EPIP team to identify the differences between current and best practices. While the term “gap” can be taken to imply a shortcoming, this is not necessarily the implication to be taken from this part of the analysis. The gaps are merely differences between the yardstick and current practices. Some differences will warrant attention and proposals for change while others may be entirely appropriate for the circumstances and characteristics of BPA and its mission.

The approach adopted by the EPIP AM Team proceeded as follows:

- *Gap Identification.* The EPIP team reviewed the “current state” information they had gathered and compared it with the “best practice” model. Additional information was also collected from Agency staff knowledgeable in the subject area. This led to a list of 121 potential gaps organized by the 12 elements of the AM model.
- *Development of Criteria for Asset Management Improvement.* After reviewing best practices, the Team Lead and KEMA Lead prepared a list of 51 AM Criteria that could potentially be used at BPA. The Business Operations Board (BOB), the Sounding Board, and the full AM EPIP Team reviewed the list and identified the high priority criteria that the future state of AM should satisfy. The high priority criteria were grouped into five themes: governance, strategy/vision, operational control, stakeholder involvement, and spending framework.
- *Assignment of Listed Gaps by Criteria Theme.* The team sorted the gaps according to the five criteria themes.
- *Force Field Analysis.* The EPIP team conducted a force field analysis to identify the forces that were working in the direction of change and the forces inhibiting change. Those forces are summarized in Figure 1.3.

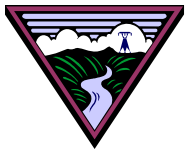


Figure 1.3
Force Field Summary

Drivers of Change	Inhibitors of Change
One BPA—Desire to optimize asset decisions across the organization	Culture resistant to the discipline of internal controls
BOB interest in disciplined AM and management control	Weak links between strategy and performance
Motivation of BLs to adopt best practices	Lack of AM skill sets and recognition of its value
Interest in a long-term view (shared vision and strategy)	Vested interest in the status quo
External pressures for formalized process design	Resource constraints

By identifying driving and restraining forces, force field analysis begins to reveal action items for moving forward. The forces favoring change can be strengthened. The forces inhibiting change can be counteracted. The AM EPIP Team first developed such courses of action for the key gaps under each of the criteria themes. These were in turn aggregated and integrated into a set of overall recommendations for the Agency.

Future State Solution Design

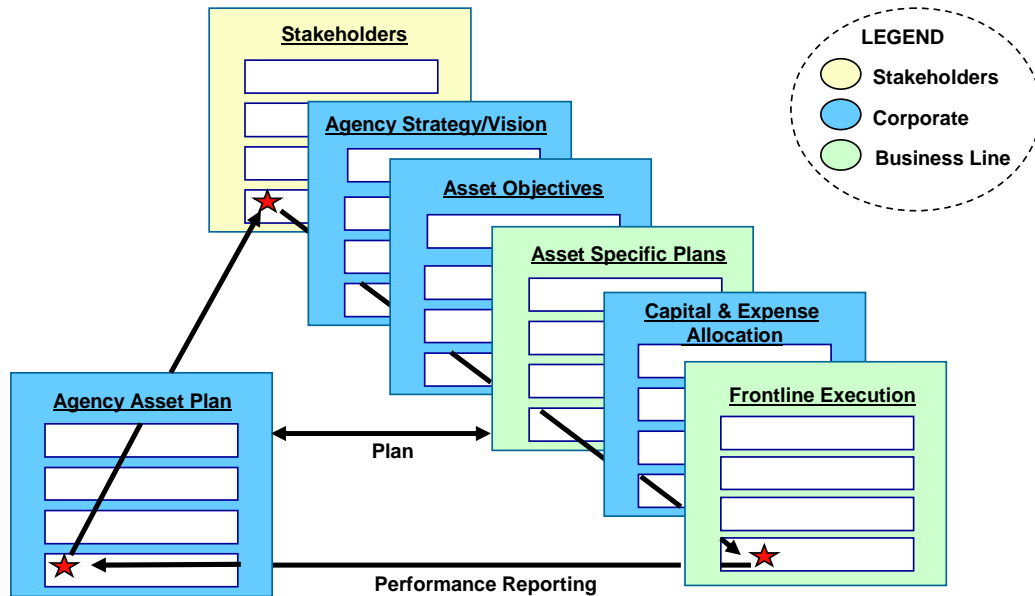
The recommendations of the AM EPIP are the product of the review of current state of AM at BPA, the description of best practices in the industry, the identification of the disparities between BPA practices and best practices, and, finally, an assessment of the priorities within BPA. The AM EPIP placed special emphasis on designing its recommendations to accomplish the objectives established by its Charter at the outset and the priorities that were identified during the process of completing the work.

Best practice asset management includes a “line of sight” connection between stakeholder interests and corporate strategy, planning, and execution. The Asset Management EPIP recommends that this idea be the core of the future state. Figure 1.4 illustrates this. The Agency assesses stakeholder and corporate objectives and then provides guidance for asset planning. The business units with direct asset responsibilities prepare the asset specific plans. The budget funds the plans. The BLs then implement the plans with the available financial resources. The individual asset plans and the associated frontline execution performance are consolidated into the “one BPA” asset plan.



Figure 1.4

Asset Planning and Decision Making Line of Sight



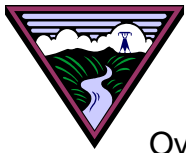
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The Vision for AM sets the stage for specific recommendations. Designing the correct sequence to the recommendations and deciding how aggressively BPA should pursue the necessary improvements are critical challenges for creating an actionable agenda.

A rational decision to implement the recommendations ought to be based on an understanding of the expected benefits and costs. Based on industry experience on expected benefits of a strong AM regime, BPA should expect:

- Tighter linkage between the asset and the strategic objectives of the organization,
- Instituting a more tightly defined set of criteria for making asset-related decisions,
- Approaching asset-related decisions holistically across the organization to ensure that limited resources are optimally allocated, and
- Greater specificity around roles and responsibilities for asset planning and care.



Over the years, BPA and its asset-owner partners have made significant advancements in collaborating to make improvements in managing the assets of the FCRPS to meet the diverse needs of our stakeholders, including Treasury and the (Office of Management and Budget (OMB)). The best practices that exist today in the industry have surpassed the practices we currently employ. The AM EPIP team found a significant number of gaps between our current practices and the advancements made elsewhere in the industry. Most significantly, we found great diversity in how asset decisions are approached at BPA across different asset categories.

The agency now has the opportunity to apply the industry's improved approaches and practices in asset management to maximize the value of the FCRPS assets to our stakeholders. By adopting the recommendations in this report we expect to achieve tangible benefits for our stakeholders such as cost reductions, improved performance of our assets (e.g. hydro output, hydro availability, transmission reliability), lower rates and improved environmental results and compliance. It is too early in the process to quantify these benefits.

It is easier to estimate the cost of implementing the near term recommendations. Accordingly, the 2006 calendar year recommendations have been scoped and designed to minimize the need for increased budgets. As designed, the agency's asset manager function may take up to 4 Full Time Employees (FTE) to implement. Both transmission and power will need to spend around \$350,000 to implement the recommendations exclusive of money necessary to acquire and implement agency strategy and capital allocation software. Budget and FTE resources may be available by reprioritizing other work. A key recommendation is that our Internal Audit group does a review in November 2006 on the Agency's progress in implementing the recommendations so that an informed decision can be made with respect to continuing to implement the EPIP recommendations.

The following sections are the specific recommendations. They are arranged according to 5 categories of Governance, Strategy/Vision, Operations, Stakeholder, and Spending Framework/Capital Allocation.

Recommendations: Governance

1. Agency establishes Agency asset manager position with responsibilities for corporate asset strategy, AM coordination, preparation of the Agency asset plan, and continuous improvement in asset-related resource allocation.
2. Agency establishes Asset Managers for each asset category (Transmission; Hydro; CGS, IT, nonelectric buildings; EE; and F&W) with responsibilities for asset planning and plans; implementing asset investment strategy and additional analytical tools; and evaluating asset performance and condition.
3. Establish an AM Council consist with Standards of Conduct (SOC) to facilitate a coordinated agency AM function. Council to be comprised of Agency Asset



Manager, each asset category asset manager, and Chief Risk Officer (CRO) designee.

4. AM Council assists Agency Internal Auditor in evaluating progress of Agency's AM effort by end November 2006. Recommendations resulting from the evaluation are to be made to Chief Operations Officer (COO).
5. Administrative Process: COO establish the appropriate agency wide organization structure that facilitates implementing AM function as part of agency reorganization effort in fiscal year (FY) 2006.

Recommendations: Strategy and Vision:

1. Adopt a 2-year strategy development and budgeting cycle and begin with budget cycle in FY 2006 followed by a strategy cycle in FY 2007.
2. Create an Agency strategic plan, including an Agency vision of the future between November 2006 and November 2007 (next Agency strategic planning cycle).
3. Agency strategic planning group develops long-term BPA strategic objectives, to include performance expectations and agency asset targets (level 1 pbviews input for FY 2008 by April 2007),
4. In fiscal 2007 the Asset Category Asset Managers prepare AM strategies for all asset categories guided by the Agency strategy (available by March 2007). The asset strategy includes a vision, strategic intent, and an overview of asset condition, identification of performance criteria and targets, and key initiatives to address the vision.
5. Finalize the Agency asset strategy based on the individual asset category strategies by September 2007.
6. Incorporate Agency strategy into the agency-balanced scorecard with line-of-sight supporting objectives at all levels of agency for fiscal 2008

Recommendations: Operations

1. Define the strategic physical assets for hydro and transmission within 90 days of AM EPIP final report.
2. Establish an asset registry for these assets to provide sufficient data for asset planning in 2007. Asset Managers are responsible for the registry. Asset Managers collaborate with EPIP Program Manager Office (PMO) to assure alignment with Supply Chain, O&M, and Plan-Design-Build (PDB) EPIP's.

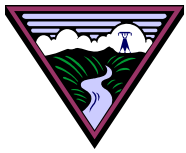


3. Develop asset plans.

- a. For hydro, complete 2 prototype asset plans for Black Canyon and Dworshak by end of March 2006. Prepare an Agency assessment of these completed prototypes consistent with Agency needs and decide how to move forward on additional plans. Subject to this assessment of these pilots, complete 4 additional Corps of Engineers (Corps) and Bureau of Reclamation (Reclamation) project asset plans by September 2006.
- b. For transmission, after completion of the Asset Definition and Asset Registry and the first 2 hydro plans, complete 2 asset plans by September 2006.
- c. Complete all asset plans for remaining hydro and transmission assets subject to first quarter FY 2007 review of AM program.
- d. Define assets for the nonelectric buildings, create an agency inventory of nonelectric buildings, and develop a condition assessment format and methodology in FY 2006, complete the condition assessment of all nonelectric buildings in FY 2007, and begin development of asset plan in FY 2007.
- e. Asset plans for other assets will be considered upon completing the first year review of the asset program in the first quarter of FY 2007.
- f. Draft agency asset plans available for FY 2008 public comment period for capital and expenses. Final agency AM plan is completed in August 2008 when Administrator makes final budget decisions.
- g. Agency Asset Manager reviews asset category plans to implement Asset Plans by close of FY 2008.
- h. Asset Plans are implemented in FY 2009.
- i. By September 2007, AM Council will recommend to the COO draft assets specific performance and condition targets that meet agency level one targets.
- j. Final performance and condition targets that cascade from level one pbview targets through asset specific asset targets established by September 30, 2008.

4. Emergency preparedness:

- a. Asset plans need to explicitly consider agency emergency preparedness implications in the areas of prevention, minimizing adverse affects and on recovery;



- b. Supply Chain EPIP, PDB EPIP, and O&M EPIP have a coordinated approach to emergency preparedness in their recommendations.
5. AM Council will recommend training to exploit the benefits of modern AM.

Recommendations: Stakeholder

Adopt a routine, periodic and integrated process for interacting with stakeholders on AM when stakeholders are reviewing BPA programs.

Recommendations: Spending Framework/Capital Allocation

1. Standardize financial analysis requirements across asset categories in FY 2006 for use in FY 2008 budget process.
2. Define end state capital allocation process with goal of full implementation in FY 2008.
3. Implement first phase of capital allocation methodology in FY 2006. Phase 1 is to be implemented by Chief Financial Officer (CFO).
4. Put agency strategy and capital allocation software in place in FY 2006 and calibrate to agency needs

Implementation, Roles, and Responsibilities

The recommendations are designed as a phased program. Asset plans are to be developed over the period from 2006 to 2008 with full plan implementation scheduled to commence in 2009. AM strategies are to be prepared early in FY 2007. The strategies and the associated plans then become the basis for the 2008 budget process. An evaluation is scheduled for the first quarter of FY 2007 to monitor progress of AM implementation and to adjust the framework as appropriate.

AM will involve all levels within and across BPA. The recommendations are designed to provide the necessary policy and strategic guidance from the Agency level. The business units with the direct asset responsibilities undertake the asset-specific strategizing and planning. This knowledge is then aggregated at the Agency level to create the BPA AM plan. The interdependent roles and responsibilities are summarized in Figure 1.4.



FUNCTIONAL ROLES AND RESPONSIBILITY (Figure 1.4)

	- Agency -	- Asset Category -
Agency Strategy	●	☉
Agency AM Strategy	●	☉
AIS Tool	●	☉
Other Enabling Tools	○	●
Asset Plans	◐	●
Aggregated Asset Plan	●	☉
Asset Plan Implementation	○	●
Performance Evaluation of Business Line Processes	☉	●
Performance Evaluation of Asset Management System	●	☉
Stakeholder Involvement	●	☉

Legend

● = Lead Responsibility

◐ = Guidance and Approval

☉ = Collaboration

○ = Coordination & Information Exchange



2. Overview

Since its creation through the Bonneville Project Act of 1937, BPA has played an important role in the Pacific Northwest managing the power and transmission facilities of the FCRPS. As the region's population and economy have grown, BPA's role has also grown. In addition to fulfilling its mandate to maintain system reliability, BPA is required to play an active part in promoting rate equity, environmental protection, and the development of conservation and renewable resources.

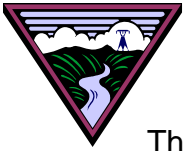
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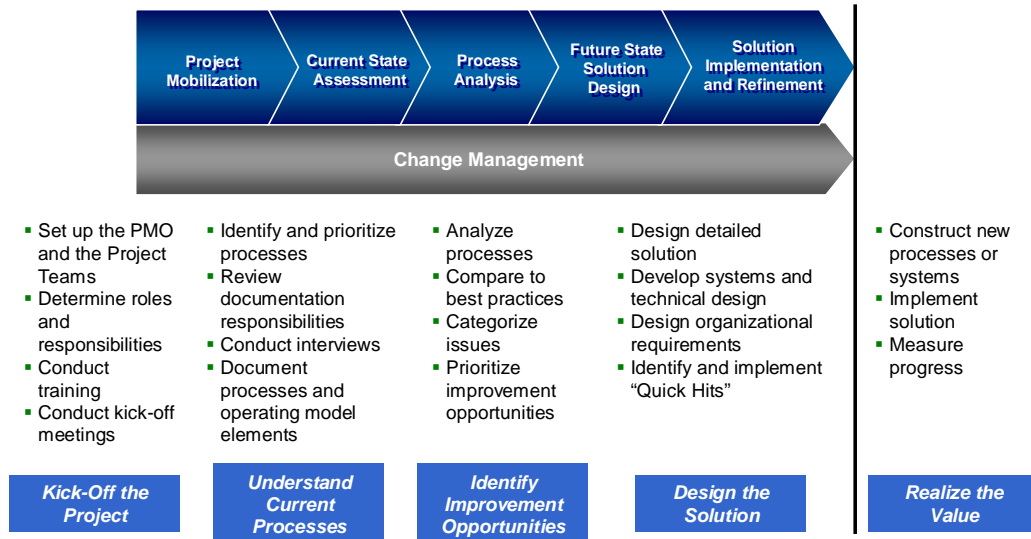


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Figure 2.1

KEMA's Tailored Approach to Achieving Excellence in Asset Management



The remaining sections of this report parallel the steps in the data collection and analytical methodology used to develop the AM EPIP recommendation and detail the team's findings from each key step.

- Chapter 3 provides a description of the current state of AM at BPA. It compares and contrasts how 7 key asset areas perform in each of 12 functional categories that encompass the stages of the AM life cycle.



- Chapter 4 describes industry best practices for each of the 12 functional categories of the AM life cycle.
- Chapter 5 identifies the major gaps between current BPA practices and leading industry practices, comparing the 7 asset groups across 5 key gap areas – Strategy/vision, governance, operations, stakeholders, and spending framework.
- Chapter 6 consists of the AM EPIP's recommendations for how BPA should restructure its AM.



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3. Current State

A general finding of this initial stage of inquiry is that each of the seven asset areas does successfully manage its assets. However, the different asset categories display widely disparate levels of explicitness, detail, and sophistication in their treatment of different phases of the AM life cycle. Furthermore, the different asset categories show varying degrees of alignment between processes addressing successive stages in the life cycle. For instance, for some groups, financial planning involves a detailed assessment of future financial needs based upon anticipated consequences and their likelihood of occurrence. The consequences that are considered are explicitly linked to stated policy, strategy, and perceived risk. At the other extreme, financial planning may simply be an exercise in fitting tasks or projects to available budgets with minimal strategic guidance or anticipation of potential changes in the operating environment.

The first step toward making improvements in AM at BPA is to document how current processes function in each of a series of key categories, each of which reflects a critical phase or facet of the overall life cycle of the management of capital assets. For the purposes of this EPIP study, the AM life cycle is described in terms of twelve distinct functional categories:

1. Policy
2. Strategy
3. Information Management
4. Risk Identification, Assessment and Management
5. Legal, Regulatory and Other Requirements
6. Objectives
7. Condition Targets
8. Plans
9. Financial Planning
10. Implementation and Operation
11. Emergency Preparedness
12. Review and Continuous Improvement

The EPIP team identified 7 asset categories for which interviews were conducted and documents were gathered:

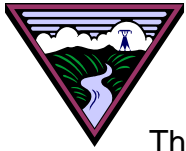
- Hydro
- CGS
- Transmission
- F&W
- EE
- IT
- Buildings

The result of this research on the current state was a description of how each of the asset categories addresses the 12 functions of AM. The team's summary appears in Figure 3.1



Summary Table – Status of Current Asset Management Program (Figure 3.1)

Asset Management Program Element	Hydro	Columbia Generating Station (CGS)	Transmission	Building (HQ & Ross Complex)	Information Technology	Fish and Wildlife (Construction projects)	Energy Efficiency
Asset Management Policy	Documented in Memoranda of Agreement developed in collaboration with Corps & Reclamation	As directed by Energy NV Strategic plan & CGS Long-Range Plan (annual updates)	Guided by internal & external documents	Limited & tied to operational issues	Limited policies	BPA program driven by law & Power Council	BPA program driven by Law & Power Council
Asset Management Strategy	In place since 1999, updated in 2004	See above	Work in progress; derived from long range plans	Strategy limited to location/ siting decisions	Focus on decision process for acquiring hardware & software	Set by Power Council or procurement actions	Selection process considers up front whether project will save energy
Information Systems	Multiple specialized systems supporting Asset Mgmt. Tracked by "Project" (site)	Meet extensive nuclear industry standards for data gathering & reporting	BES intended as primary tool, supplemented by a variety of specialized systems	Substantial for HQ building. Ross Complex uses hard copy inventories	Multiple, specialized systems with different purposes	Focus on contract & project Mgmt. indirectly address Asset Mgmt. (Use BES & FISCES)	Use Regional Technical Forum database (energy savings focus)
Risk	Formal process to access equipment condition (tied to reliability)	Formal tools assessing value & Probability of failure	Focus on system reliability impact if facility is unavailable	Focus on business impact if facility is unavailable	Focus attention to critical systems; limited methods for addressing life cycle risks	Focus on risk related to contract nonperformance	Focus on risks related to contract / project nonperformance
Legal Regulatory Framework	Consider multiple governing requirements in developing plans & programs	Heavily regulated industry. Formal and extensive documentation of processes	Consider multiple governing and industry requirements in developing plans & programs.	Extensive monitoring of building codes, etc. Compliance as requirements change.	Dynamic environment, try to meet reporting requirements at any point in time, cyber security compliance a priority.	Program decisions reflect extensive set of statutes, court, rulings, etc.	Program decisions reflect extensive set. of statutes, local codes, etc.
Asset Management Objectives	Have Strategy Map, BSC & measure in place, updated periodically.	See Policy above; Objectives for safe, reliable & low cost operations, developed through formal method.	Have BSC & Key Performance indicators, established through formal mgmt. process.	Focus on annual operating plans or BSC.	Development of an IT Architecture strategy in-process.	Focus on individual contract requirements.	Focus on program goals, reducing kWhs
Performance Systems (Conditions & Targets)	Have established Performance targets & financial incentives, managed through annual contracts with Corps & Reclamation	Multiple performance targets established per internal & external requirements	Emerging Asset Mgmt. program Condition assessments being considered	Work in process for HQ. Ross building targets are tied to budget plans.	Work in process but not yet tied to Asset Mgmt., focus on project mgmt.	Focus on project & contract goals.	Focus on measurable, verifiable energy savings as precondition for contract.
Asset Plans	Develop up to six pilot plans in FY 2006	See Policy & Objectives above Formal documentation of major maintenance program.	Specific plans tied to equipment type direct current efforts	Work in progress for HQ, tied to 24/7 reliability & office quality.	Focus on project mgmt. & organizational resources	Focus on contract & project mgmt. (selection process determines if project will benefit F&W Program, limited follow up once contract is awarded)	Focus on contract & project mgmt.; (selection process determines if project benefits EE Program, limited follow up once contract is complete)
Financial Planning	Extensive analyses to support capital & O&M budget requests. Business cases for continued investments, partial use of life cycle analysis.	Formal process to identify funding needed to accomplish long-range plan. Create business case for each project.	Extensive analyses to support capital & O&M budget requests. Developing "Common Asset Investment Model"	Limited to expense & capital budget processes. Develop business case for capital requests.	Focus on project mgmt. & organizational resources, do not reflect life-cycle Asset Mgmt. perspective	Focus on contract & project mgmt., and annual budget process.	Focus on contract & project mgmt., and annual budget process.
Implementation (Management Framework)	Proactive management of program with Corps & Reclamation via formal agreements. Aligned training efforts.	Roles & responsibilities are well-defined & documented.	Matrix Team reviews and recommends funding requests emerging Asset Mgmt. program.	Some proactive mgmt. tied to Asset Mgmt. Limited formal roles, some related training.	Isolated areas & processes consider Asset Mgmt. Training aimed at project & property mgmt.	See above	Extensive communications regarding program accomplishments
Emergency Preparedness	Participate Regional infrastructure protection effort plus COOP.	Two standing preventive plans as required by law.	Participate in Regional infrastructure protection effort plus COOP.	Preventive projects for HQ, plus COOP for all sites, work in progress.	COOP & Critical Infrastructure Protection are works in progress	Hatcheries may have emergency plans.	Not applicable to program
Continuous Improvement	Proactive annual review & evaluation process with partners, plus self-assessments.	Formal periodic reviews & assessments	Accomplished through periodic reviews of KPIs	Focusing on establishing overall strategy	On-going process improvement. Priority is to stabilize organization & then evaluate.	Progressive refinement of contract process. Working with Power Council to improve solicitations & guidance	Annual oversight reviews with participating utilities



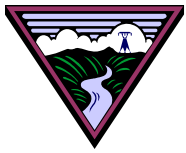
The goal of this study is to identify (and ultimately implement) an Agency AM process that is efficient, effective, and consistent across asset areas. To bridge the gap between current and best practices, it is first necessary to get a clear and accurate picture of how assets are managed at the present time. In this section, the current state for each of the 7 asset areas at BPA are compared across each of the 12 functional categories of AM. The individual asset area addressed in most detail in this section is the one determined to be the best example of how BPA deals with the specific issues of a particular functional category.

1. **Policy** – An Organization’s Asset Management Policy establishes the overall intentions and direction of an organization with regard to the assets (e.g., policy of balancing economic and social objectives or a deliberate policy of choosing “middle of the road” technology rather than “cutting edge” technology). Policy also addresses the framework for the control of asset related processes and activities (e.g., depreciation rates, discount rates, cost-benefit requirement).

Policy is the starting point for unifying AM across an organization. Without this, alignment and consistent management control is not possible. While BPA lacks such a unifying, Agency-level policy to coordinate the management of assets across the seven major categories, policies of more focused applicability or scope are in place.

For both generation and transmission, “policy” largely consists of interlocking sets of prescriptive regulations, regulatory guidance, and industry standards.

- For hydropower, AM policy is grounded in the authorizing legislation that specifies a purpose for each hydro plant. For nearly all FCRPS hydro projects, power is a subordinate purpose, served only after meeting other project purposes. Both the Corps and Reclamation have policies in place regarding the stewardship of their hydro assets. Further policy guidance comes from BPA’s vision statement, Congressional budgets, and memoranda of understanding between BPA and the Corps, and BPA and Reclamation. Additional program direction comes from Joint Operating Committees and associated subcommittees, Biological Opinions (BiOps), the System Operation Review and other environmental documents govern operations of the system.
- For CGS, the Energy Northwest Strategic Plan (Strategic Plan) and the CGS Long Range Plan (LRP) provide the AM policy framework. In addition, a large portion of the Energy Northwest AM policy is prescribed in the form of regulations, regulatory guidance, and industry standards. These requirements and guidance include specific criteria regarding the purchase, operation, maintenance, and testing of plant systems, structures and components.
- Transmission uses internal and external documented policies in fulfilling its obligations of stewardship and guiding its decisionmaking processes. These policies include Reliability Management Standards, Western Electricity



Coordination Council (WECC) maintenance standards, Customer Service Policy, and other miscellaneous organizational sub-policies.

For EE and Environmental Fish and Wildlife (EF&W), primary policy guidance originates in the terms and conditions of the Regional Act. Both of these groups share responsibilities with the Regional Power Planning and Conservation Council and, therefore, do not have unilateral control over global program policy setting. Both groups do work jointly with the Council in shaping such policy. EF&W's actions, in particular, are constrained by a large number of Federal laws, Treaties, and Executive Orders that address specific aspects of environmental protection.

IT manages assets based upon minimal documented policies (largely on the small equipment-level). Property policy comes from the BPA Manual, Agency Priority Steering Committee Charter and processes for the project/capital side, and the Computer Capitalization Policy for project estimates.

There is no centralized policy document for all nonelectric buildings.

- 2. Strategy - An Asset Management Strategy provides the overall long-term action plan for the assets that is consistent with asset policies and directed at the objectives of the strategic plan.**

As is the case with AM Policy, there is no unifying Agency Strategy. Strategy in individual asset areas largely consists of interlocking sets of prescriptions and guidelines from a variety of sources.

CGS is guided by Energy Northwest's overall intention regarding stewardship of assets, which is documented in its Strategic Plan. The Energy Northwest asset strategy is developed and maintained by Energy Northwest management. Specifically, management review committees lead the organization regarding strategy development. The committee members set key direction and provide constraints for implementing of the policies. The Strategic Plan documents the asset strategy. Key direction and constraints are included in the development of AM policy. Energy Northwest management maintains an awareness of standards (nuclear industry standards) and regulations (10CFR50) through training programs and industry development programs. The Energy Northwest senior managers and executives develop AM policies (Strategic Plan, LRP). The policies are developed in coordination with the Energy Northwest Board of Directors.

Hydropower AM is guided to a significant degree by strategic plans regarding the stewardship of these resources put in place by both the Corps and Reclamation. For example, the Corps and Reclamation establish depreciation rates based on Generally-Accepted Accounting Procedures and the Federal Energy Regular (FERC) form of accounts. BPA establishes its own discount rates and Internal Rate of Return requirements for justifying capital projects.



Transmission is actively pursuing AM to develop a long-range action plan. Currently Transmission Business Line (TBL) uses the Capital Plan, the Capital Replacement 10-Year Plan, the Constraint Schedule Management Plan, and the Reliability Centered Maintenance Program to guide strategy.

A significant part of EE's de facto strategy is that all planning for the life-cycle of assets need to be done up front. That is, kilowatthour savings are estimated, installation is documented, and initial measurement and verification (M&V) occur. After M&V and payment, future involvement by BPA ceases. This strategy is shaped by stakeholder input, Regional Council public processes, BPA public processes, EE Working Group, and customer sounding boards.

Currently, the foundation of BPA's ongoing "strategy" for F&W assets primarily consists of coordinating the management of the 400+ projects and 600+ contracts to their conclusion. "Action planning" consists of soliciting proposals (with the Council having the lead in this process) and selecting a set to implement over a specified time interval (such as the 2007-2009 Power Rate Period).

For IT, strategy consists primarily of guidance for small, day-to-day operational items, but not for the asset area as a whole.

For nonelectric buildings, the development of a guiding strategy is in progress, with a focus on the overall space assignment for BPA office employees (location within the region and then location within a facility). The facility operations and management strategy will be the next phase.

3. Information Management - This function includes any formal tools used in maintaining asset information as well as any activities that support the management and analysis of asset information for asset management purposes. Specifically included are the databases, analytical tools, and activities that support asset decisions. It also includes both the centralized and decentralized information management capabilities.

Assets are managed by BPA using a variety of information management tools. A major tool is centralized in the Agency-level Bonneville Enterprise System (BES). In addition, each asset area has some databases of its own that are individually structured to meet the specific needs of that group's AM activities.

The hydro program maintains and is informed by several asset-related databases that address asset capability, condition, performance, and financial parameters.

- The plant capability database (generating capacity, hydraulic capacity, hydraulic head, unit efficiency, other) supports operational planning and investment analysis. The derivative documents include Fast Facts, Columbia Vista, Near-Real Time Optimizer, Fish Passage Plan, among others.



- BPA maintains condition data that support maintenance and investment decision making (hydroAMP).
- Performance data (generation, availability, efficiency, flow, head, other) support key performance indicators (KPI) tracking and performance reporting (Performance Indicators (PI), Record of Decision, Operations and Maintenance Business Information Link, Outage database, Generating Availability Data System, other).
- Long-term investment needs information and analyses support capital and financial planning (Capital Workgroup).
- Maintenance databases (Maximo, Facility Equipment Maintenance System, tubs) aid in the management of managing frontline execution,
- Expenditure databases (Corps: Corps Financial Management System, Reclamation: Reclamation's Financial Management System, BPA: BES and Capital Spreadsheet) monitor budget resources.
- Capital project databases (Corps: Premavera and Project Management, Reclamation: spreadsheets) are in place for project management,
- Financial databases (Fast Facts, BES, annual reports, rate cases), the Northwest Power Planning Council Hydro Database are used to report and analyze the financial condition of the Agency.
- The Benchmarking Database provides for performance comparisons with peer companies.

Transmission uses BES principally as its information system of record, however there are many additional, stand-alone databases that individual operating units use in their day-to-day operations and planning processes.

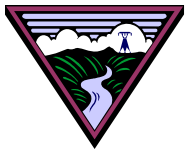
F&W uses two database management systems: BES for storing legal and contract information and Pisces for managing over 600 contracts and projects. The 2 systems interact with one another to exchange critical pieces of information.

IT uses BES for contract award funding and terms. Hardware is managed through Sunflower and software through IT Tracking. Miscellaneous spreadsheets and small databases are additionally used for specific applications.

In addition to extensive in-house databases for record-keeping of expenditures and acquisitions, EE also utilizes the Regional Technical Forum database through which customer utilities and BPA report their resource acquisitions.

The Computerized Maintenance Management System is the primary database used for nonelectric building AM. Hard copies of condition reports are also maintained for the Ross Complex.

- 4. Risk Identification, Assessment and Management – Risk management focuses on the asset-related risks to achieving the organization's goals. The emphasis is on the risks associated with the physical assets, not**



wholesale power marketing and trading activities or financial instruments in general.

BPA is in the process of adopting a risk management process model (AS/NZS 4360:2004 Risk Management Standard) that is applicable to the function of AM. While some organizations are making progress toward that goal, all would still likely be characterized at the formative stage of maturity of their AM risk management process.

Risk management associated with generating assets has reached the greatest level of development in that it takes into consideration uncertainties surrounding costs of operating the assets and the performance of the assets. Hydro risk management plans are imbedded in business planning, decision documents, maintenance strategies, Reliability Centered Maintenance and equipment spares and replacements plans. CGS contains risk management provisions within its LRP and other operational risk management plans.

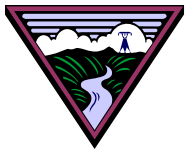
By contrast, transmission network planning continues to be performed on a deterministic basis without formal risk-based planning metrics and processes to assess overall project risk performance. Risks are, however, factored into investment planning and budgeting.

For the other groups within BPA, risk management is limited to procedural guidelines and safeguards, such as, contract specifications, inspection procedures, and other management controls.

5. Legal, Regulatory and Other Requirements - This set of the activities and deliverables supports compliance with mandates that are imposed by authorities external to the organization.

BPA is subject to numerous laws and regulations that fall into two major categories: enabling laws and regulatory requirements. Enabling laws define BPA's mission and purposes. The principal enabling laws include:

- The Bonneville Project Act of 1937 – authorized BPA to market power from the federal hydroelectric projects on the Columbia River to public agencies in the Northwest.
- The Federal Columbia River Transmission Act of 1974 – authorized BPA to construct necessary transmission facilities to deliver federal power to public agencies, provide transmission to nonpublic entities and established BPA as a self-financing power marketing authority.
- The Pacific Northwest Electric Power Planning and Conservation Act of 1980 – augmented BPA's resource acquisition mission including renewable energy and conservation resources and to take an active role in mitigating the environmental impacts of federal hydroelectric projects on the Columbia and Snake River systems.



The regulatory requirements pertain to how BPA fulfills its mission and cover a broad range of mandates and prohibitions. Mandates are things BPA must do and prohibitions are things BPA cannot do. Regulatory requirements derive from numerous sources including: federal laws, treaties, executive orders, and biological opinions. These regulatory requirements may apply to the agency as a whole while others apply more specifically to particular business units and functions within BPA.

When developing AM strategies, power and transmission must consider such things as: authorizing legislations, biological opinions, the Canadian Treaty, the Pacific Northwest Coordination Agreement, the Hourly Coordination Agreement, court orders, and other environmental, Occupational Health and Safety Act (OHSA), FERC, and WECC regulations. Additionally, nuclear plants have unique regulatory requirements defined by such entities as the Nuclear Regulatory Commission.

Both EE and F&W are groups that were primarily enabled by the Northwest Power Act. However, particularly for F&W, there are many environmental laws that define the obligations and bounds within which that organization carries out its mission. The EF&W external web site lists 13 federal laws, 2 treaties, and 4 executive orders that govern their activities. For EE, other legal and regulatory impacts that are factored into investment decisions include: Hazardous Materials; National Environmental Policy Act; State Audit Requirements; and national and local codes as they affect efficiency measures.

IT is governed by a set of continuously changing federal regulations and departmental directives that apply to its asset investment reporting, enterprise architecture standards, and cyber security.

Buildings Management must comply with numerous safety and environmental regulations and departmental directives from source, such as, Environmental Protection Agency (environmental), OHSA (safety), Federal Power Act (fire protection), American Society of Heating, Refrigeration, and Air Conditioning Engineers (environmental quality and energy), General Service Administration (GSA) (construction standards), Department of Homeland Security (security), and national and local building codes.

- 6. Objectives - Organizations that perform asset management may have formal or informal objectives for asset management. These objectives would represent outcomes or achievements required of the assets in order to achieve the higher-level goals of the Agency or the overall asset management strategy.**



Power and Transmission have the most developed and formalized sets of objectives. Transmission has developed a comprehensive performance management process to drive superior performance within the organization. This includes the implementation of best practice processes in investment decisionmaking to achieve the strategic objectives and the development of implementation strategies for corrective actions to close identified gaps in performance as measured by KPI. The four basic elements of the balanced scorecard (Stakeholder, Financial, Internal, People and Culture) were used as the primary strategic objectives in developing the KPI framework.

The FCRPS hydro program uses a strategy map and balanced scorecard that links to the strategic plans of BPA, the Corps and Reclamation. The balanced scorecard has specific measures tied to each strategic objective. Exhibits to the Memorandum of Agreement's governing the direct funding agreements further support these objectives. Joint Operating committees, subcommittees, program managers, and plant managers communicate the hydro program strategy and related performance measures within the program. The objectives, measures and targets are recalibrated on an annual basis, last done in early FY 2005.

The Strategic Plan and CGS – LRP provide a framework for the CGS AM strategy. Incorporated in this asset strategy is a formal methodology and process for managing the objectives of AM. Objectives include safe reliable operation of the plant, generation capability projections, and cost of power targets based on both projected generation and budget targets. Objectives are measured via department PIs and equipment (asset) reliability PIs. AM objectives are in place. Specific assets may also be reviewed and re-evaluated based relative value with regard to other projects or related emerging issues. Projects (assets) are analyzed using a business case model based on risk and resulting impact on generation. The AM objectives are integrated into the LRP forecasts. The LRP projections are for 10 years, and updated annually. The LRP is consistent with the Strategic Plan. The Strategic Plan is also updated on an annual basis.

The remaining asset categories utilize objectives that are less integrated into a comprehensive AM framework.

- For EE all pertinent aspects of AM are addressed contractually when a commitment is made. The process is geared toward maximizing kWhs saved for any given cost per kWh. The specific goals are set out in the strategic plan.
- For EF&W, the specifications of each of over 400 projects and 600 contracts are crafted to support larger F&W needs as well as fulfill the EF&W's organizational mission. Contractor proposals are selected to serve the program's objectives.
- IT evaluates everything on a case-by-case basis. IT's objectives are derivative of the business units that it serves.



- The annual Office Facilities Balanced Score Card and associated metrics document the AM objectives linked to the agency strategic plan. As the Facility Management Officer role evolves, this connection is being strengthened. The Balanced Score Card objectives are designed to be specific and measurable. The objectives are communicated to the staff through periodic meetings, and the sharing of plans and status reports.

7. Condition and Performance Targets - The activities that support the development and measurement of specific levels of performance or condition required of the assets in order to achieve the objectives established by the Organization.

Both Power (Hydro, CGS) and TBL groups have comprehensive and/or emerging AM plans characterized by well articulated Key Performance Indicators

The other asset groups within BPA use performance indicators for management purposes, though these are not integrated into an asset life-cycle methodology. EE has M&V requirements for the asset to be purchased and implemented by the program. However, the satisfaction of the appropriate requirements is determined by analysis prior to the acceptance of the proposal and is not explicitly measured after implementation. The program assumes that the benefits identified in the prior analysis are achieved. F&W has performance at the contract level (contract elements).

IT has performance measures for project performance (budget and schedule), but not quantitative performance targets/conditions for the asset being deployed; additionally, there are some various departmental metrics related to the operational environment, but not within an asset-based, organizationally comprehensive AM perspective.

The Headquarters (HQ) building is operated by BPA (owned by GSA) under a Delegation of responsibilities, and at "Above Standard" services for "Critical Systems" requiring 24/7 service. The Agency uses a Facility Condition Index as an indicator for replacing/investing assets.

8. Plans - A written plan that guides the systematic and coordinated activities through which an organization manages its physical assets.

In all asset categories, the decision criteria for developing business case based plans include reliability, financial, environmental, safety, and risk elements. Most decision processes also contain some form of ranking system where tradeoffs can be made.

TBL has management plans that address performance and costs, but those plans reside within the different organizations and are not linked to a central database. The hydro program currently has an initiative underway to develop a framework for plant-specific asset plans. Most, if not all, of the elements that



would be included in an asset plan already exist in some form within the hydro program. These elements address cost, performance, and risk. The Strategic Plan and CGS LRP provide a framework for the CGS AM strategy. Incorporated in this asset strategy is a methodology for determining the value and probability of failure (risk) of physical assets.

F&W designs contracts to addresses what would otherwise be contained in asset plans. These contracts address performance and cost, but deal with risk only in the sense that results that are not achieved are not paid for. In the case of EE, issues of cost and performance are addressed in the program documents with little direct treatment of risk.

For IT, these issues are also addressed on a contractual level – specifically when software or hardware is purchased. Project documentation provides qualitative performance goals. Project proposals are required to address lifecycle costs and risks, but the focus is primarily focused on the project execution. Longer-term cost, risk, and performance are not assessed after the project is delivered.

9. Financial Planning – This refers to planning specifically directed at the financial resource requirements over the life-cycle of the physical assets.

Hydro, Transmission, and CGS use formal assessment tools on an annual basis to determine future capital needs. Because the Power Business Line (PBL) is no longer acquiring new resources, its planning focuses on equipment replacement needs (with long forecast horizons of 20 and 50 years) and 5-year O&M expense forecasts. BPA’s Federal Hydro Projects are subject to a leading practice decision process that considers project justification, alternatives, risks, costs, and benefits. (See the Figure 3.2, “Hydro’s Decision Support Document (DSD)” at the end of this chapter.)

As part of an OMB budget exercise, Transmission forecasts and assesses scenarios for both new acquisitions and replacements. Both BLs are planning to adopt a common Asset Investment Strategy Model in the near future. Planning for the CGS is performed by an AM Group within Energy Northwest. That process combines the results of the Plant Review Committee’s decisions and the results of strategic and business planning.

For F&W, EE, and HQ Building Plant, financial planning is primarily a matter of linking specific projects with agency budgeting and capital approval processes. Lifecycle planning is conducted primarily at the level of specific projects. The budgeting and approval process associated with F&W’s project planning is guided by and conducted in conjunction with the Council’s F&W Plan.

IT financial planning is less programmatically constrained than EE or F&W. It links the financial resource available with the Agency’s needs without requiring



more elaborate assessments of consequences and likelihoods characterizing the Hydro and Transmission deliberations.

10. Implementation and Operation – This refers to the organizational structure of how asset planning is currently executed, plus training and communications.

Implementation and operations for the hydro program are guided by a three-agency strategy forum that includes BPA, the Corps, and Reclamation.

- BPA's lead for hydro asset planning is the Federal Hydro Projects (PGF) manager. An asset manager, a capital manager, an O&M manager, a performance manager, and four project representatives support the PGF manager. A similar structure for asset planning exists within the Corps and Reclamation. PGF staff has the responsibility of program development.
- The Vice President of Generation Supply and Senior Vice President for the Power BL set program direction and approve budgets.
- A delegation of authority chain is clearly defined in PBL's financial process documents. Each PGF employee has a Skills Assessment under the Employee Development Pilot Program. This assessment identifies training needs of employees. Training is provided, based on available resources.
- For staff with direct asset responsibilities, internal communications are handle via staff meetings, a weekly operations call, weekly Project Representative meetings, a weekly Core Team Meeting, twice-weekly Management Team Meetings, and specific topical meetings as required. Telephonic and electronic media are also used.
- External communication is handled through formal hydro program forums, which include a Strategy Team, Joint Operating Committee (JOC), and JOC Subcommittees. The FCRPS website, telephonic and electronic media and courier services are also used. Additional external forums include the Sounding Board, Power Function Review, and future regional dialogue forums

The Strategic Plan and CGS – LRP provide a framework for the CGS AM strategy. Incorporated in this asset strategy is the organization structure for asset planning.

- Responsibilities are defined in specific plant operating procedures for all individuals involved in AM. Three committees at worker level, department management level, and executive level review projects (assets) for prioritization based on nuclear safety, regulatory commitments, licensing basis requirements, and optimization of generation.
- Training is provided by a dedicated training staff and is accredited by the Institute of Nuclear Power Operations. Infrastructure to track employee training and qualifications is in place. Communication is generally upward when determining asset planning, needs and priorities, and generally



downward when setting budgetary and generation targets and business goals.

- The Energy Northwest organization structure, training, and communication are structured to support the needs outlined in the LRP. The LRP projections forecast demands and costs for the next 10 years.

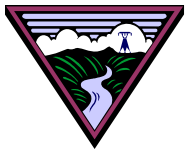
The TBL responsibilities are managed by a Matrix Team with established processes. This is complemented by Chapter 20 of the BPA Manual. Chapter 20 describes how the authority for executing contracts related to developing the transmission grid is delegated to the Senior Vice President of the TBL.

- The TBL is considering a 3-tiered approach to cross training: Level 1 will be for entry engineers (up to 5-years experience), who will rotate through most of the engineering and field disciplines for short tours of duty; Level 2 will be for more experienced engineers who will rotate through fewer engineering disciplines but will spend a greater amount of time rotating between the field and design; Level 3 will be for Managers' rotation and should be for a minimum period of 1 fiscal year.
- Internal communications take place primarily through the Transmission Business Line Management Committee (TBLMC) meeting and the TBL Executive meetings, as well as the TBL AM web site and ad-hoc AM change management presentations to work groups. A process for external communications is currently under development.

Within the EF&W Group, planning, analysis, and hands-on activities are all controlled by and implemented through contracts. Roles are clearly defined.

- Within EF&W, separate workgroups are responsible for planning and monitoring contracts pertaining to projects on the Lower and Upper Columbia River respectively. Responsibilities generally follow the line structure in these organizations. Business Operation Support has responsibility for budgets.
- Training in project management and contract monitoring is provided in-house. Training plans have been developed and reside in the Pisces database.
- Internal communications are handled through face-to-face contacts, on the internal EF&W website, and through Pisces and BES. While all of these methods could be in principle be used by anyone within the Agency, use of Pisces and BES is generally limited to staff with direct asset responsibilities.
- Information is routinely shared with the Council through regular reports and informal contact. Public involvement processes occur around planning and rate case cycles. Yearly reports and BPA's external website also provide a source of information for outside parties.

EE's planning and program implementation groups develop programs for achieving megawatt targets.



- Training for this group consists primarily of on-the-job experience over the last 25 years of running programs as well as technical training in conservation-related engineering and program evaluation.
- Internal communications take place via briefings and through BES reports. External communications are carried out through public forums and meetings about program design needs and via Council's planning processes.

AM for IT takes place under the Chief Information Officer and through Regional Response and Recovery Team and PMO processes and through the Agency Priority Steering Committee (APSC) project process.

- The APSC reviews and approves IT proposals, monitors project progress, and recommends changes to BPA's agency-wide portfolio business automation projects. It also has the responsibility (1) to ensure that investments in business automation are aligned with capital planning and control criteria; and (2) to advocate for adequate funding for automation projects to serve the agency's strategic goals. The committee's membership represents each of the agency's three business units.
- Much of the IT training takes place on the job. Project managers receive formal training.
- Internal communications take place through PMO administration. The project managers and sponsors produce documents related to project funding. The APSC Chairman and Coordinator arrange the logistics for decisionmaking, planning, and results. The Project Portfolio Manager (PPf) is the communication channel for PPf decision records, annual budget process requirements, and activities that require Agency level approval and oversight. IT Program Management coordinates the overall IT budget.

For the HQ building, executive oversight and control is managed via the approval process for capital requests and the overall budget.

- Staff is trained through professional accreditation (International Facility Management Association or Building Owners and Managers Association), self-study, academic programs, and on-the-job coaching.

11. Emergency Preparedness - This refers to the planning specifically associated with protecting the assets against natural and man-made threats.

Emergency preparedness plans are formalized within groups that manage assets that are directly related to issues of security, safety, reliability and business continuity. Some of these plans reflect prevalent industry practice while others are mandated by various regulatory requirements. All groups within BPA have Continuity of Operations Plans (COOP), which define responsibilities and procedures for staff members in emergency situations.

- Power and Transmission participate with BPA Security to plan for protecting BPA assets from increased security threats post 9/11. They



also participate in power emergency procedures, tabletop exercises, threat level procedures, flood control management plans, emergency closure devices, black start and emergency restoration plans and exercises.

- With regard to CGS BPA maintains a working knowledge of two plans developed by Energy Northwest (NW): the Emergency Plan and the Security Plan. The Emergency Plan is written to address emergencies at the CGS and the Owner Controlled Area. It also describes the emergency preparedness capability of Energy NW and offsite emergency response organizations. The Security Plan, a document that can be released only to individuals with security clearance, addresses the physical security needs of CGS.
- For F&W, the O&M plans for facilities such as hatcheries contain emergency preparedness provision.
- Buildings management – In addition to COOP, building management participates in emergency preparedness and continuity of operations planning and exercises. Additional projects related to building seismic reinforcement, power supply redundancy and enhanced building security have been undertaken. Buildings management participates with BPA Security in BPA's Security and Emergency Preparedness activities.

12. Review and Continuous Improvement – The last step in the asset management life cycle is a review of current processes with an eye towards continuous improvement in successive cycles of asset development and operation.

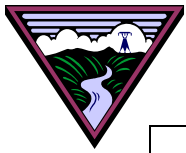
Most asset categories have established management review processes for asset performance against the established goals/objectives/targets. The exception is the non electric plant category.

- For hydro, several processes and reports assess hydro program performance against targets, including a JOC end-of-year Performance Evaluation Report, a JOC annual program report, Hydro Power Reviews, and NERC/WECC audits.
- For transmission, TBL's asset performance targets are depicted as KPIs. The KPIs are tracked by the AM group, and reported regularly at tier-II meetings and monthly at TBLMC.
- For EE, the main review of asset performance occurs after acquisition through the annual Oversight Review with each utility. Most asset performance assessment occurs prior to the acquisition decision followed by M&V, typically within the year of installation. After acquisition and M&V, there is little ongoing monitoring of asset performance.
- At CGS, there is management review of asset performance that is tied to nuclear power industry and regulatory goals and targets as well as plant specific objectives.
- In the case of F&W, asset performance is evaluated on an ongoing basis as a part of contract management.



CONCLUSION

The Agency has a wide variety of approaches and processes for managing AM. This is due to a variety of factors including the diverse objectives embodied in authorizing statutes, the need to collaborate with other organizations on asset-related questions, and the internal dynamics associated with individual program needs. The net effect of all these forces is an ad hoc collection of approaches with little commonality across the organization.

**Figure 3.2****Hydro's Decision Support Document**

BPA's Federal Hydro Projects developed a project evaluation process several years ago that involved filling out a "Capital Project Priority Form." This form, which was known as the "Decision Document" was intended to provide a consistent presentation for all new capital investments and to allow for a systematic determination of project priority. The current form, known as the "Decision Support Document" (DSD) is a modified version of the initial one started in 2000.

Shortly after the Asset Management Strategy for the Federal Columbia River Power System came out in 1999, and following the signing of all four memoranda of agreements on direct funding, Hydro's Capital Investment Program was in need of a more objective process to consider and ultimately chose projects for equipment replacement or refurbishment. Initially, version 1 of the Decision Document was developed. It consisted of 5 parts:

- Project description, alternatives, schedule, risk, justification, and other qualitative management items;
- Detailed breakdown of projected costs (expenditures) by labor/contracts to complete the project;
- Identification of anticipated benefits with project completion, either monetary or qualitative;
- If appropriate (i.e., monetary power benefits), an economic analysis including net present value, benefit/cost ratio and internal rate of return; and
- Project Priority Score, which was a rating of the project's significance with regard to "value of investment," "material condition," "reliability," "environmental," "safety/workplace quality," and "regulatory."

After about 2 years of implementation (in 2002), a second version was developed. It expanded slightly on the eliminating the project priority score. The first two alterations were minor and did not substantially change the purpose, intent or use of the document. The third alteration was more significant. It eliminated what was thought to be an important method for ranking projects. However in use, the project priority score did not provide decision makers with any valuable comparison among competing projects. In other words, a low scoring project was often as necessary as a high scoring project. The scores were often more connected with what the proposed equipment affected – for example, the replacement of a failing transformer would score high where as a failed generator winding would have a lower score. The transformer, even though it was still working would pick up points from the environmental, safety/workplace quality and regulatory factors that the generator winding would not. Both of these example projects though would have significantly high economic return and would be judged as critical investment needs. Consequently, the current version of the DSD focuses on the economic basis for replacement/repair and not on a broad set of ranking factors.

As part of the introduction of the second version and to distinguish it from the first version, its name was changed to "Decision Support Document." The word "support" was added. This change recognizes explicitly that rating projects is not an exact science and cannot rely solely on a numerical ranking. Technical judgment, along with the proper context, is essential. The DSD "supports" the decision making process; it is not a replacement of it.

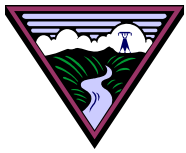
Federal Hydro Project's capital program currently uses the DSD for all new projects and it is updated whenever a project moves into phase work or requires a significant cost increase. The form itself is available electronically to project proponents, it is an Excel spreadsheet, and the data only needs to be entered once on the form. It also provides an effective outline for its presentation to decision makers by the project proponent. Typically, 5 to 10 DSDs are considered at each meeting of the Capital Workgroup, the body that manages the hydro power capital investment program.

A current version of the DSD is included in this report in Appendix 1



Bonneville Power Administration





4. Asset Management Best Practices

Effective implementation of asset management principles can only be achieved within a framework of appropriate control and monitoring by management.

Australian National Audit Office

The past decade has seen substantial evolution in the utility companies' approach to managing physical assets. Among the changes are a more tightly defined set of criteria for making asset-related decisions, greater specificity around roles and responsibilities for asset planning and care, and tighter linkage between the asset and the strategic objectives of the organization. The result of this evolution is a set of practices that has come to be called "asset management."

Although there is broad consensus of what constitutes AM, the specific activities at any given company can vary widely. This variation is entirely appropriate given different circumstances of the diverse organizations that generate and transmit power. Consequently, this section provides an overview of principles and best practices. It is not a description of how any individual company approaches these issues. It is a compilation of the leading practices around the world condensed into a high-level vision of AM. As such, it is a standard of comparison, not necessarily a prescription of what AM should be specifically at the BPA. It does, however, capture principles that should be consistent with the future of AM at the BPA.

BPA is accountable for fulfilling a variety of statutory obligations. It must balance business concerns with those of stewardship. Given the diverse roles that the Agency must perform, it is difficult to benchmark its AM practices to specific utilities or power producers. The "best practices" model of AM provided by KEMA and used to structure both data collection and comparisons between asset areas, however, provides a framework that can be adapted and tailored to the specifics of the legal and regulatory prescriptions that govern BPA's operations (e.g. Regional Act responsibilities, BiOps, Treasury repayment obligations, etc.).

The "best practices" model or framework for AM displays the following characteristics. It is:

- **Holistic** in its orientation, leading to appropriate decisions for the organization as a whole as expressed in its goals and strategies, rather than sub-optimizing for individual asset areas.
- **Systematic** in application and transparently methodical, repeatable, and auditable.
- **Systemic** in outlook, viewing assets as a system rather than in isolation,
- **Structured** so that roles and responsibilities are clear and management control is integrated,
- **Risk-based** and oriented towards priorities appropriate for the identified risks,

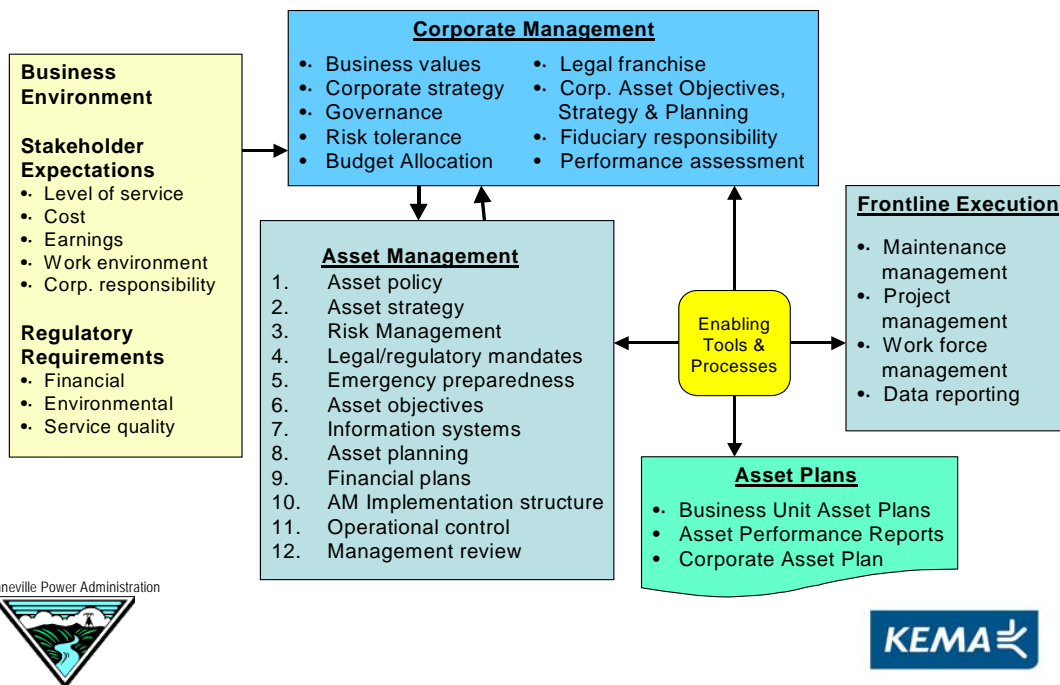


- **Optimal**, embodying the best trade-off among performance, cost, and risk over the asset life cycle,
- **Sustainable**, characterized by achievable levels of service delivery, capital spending, and O&M over time, and
- **Process driven** requiring loyalty to one process that cuts across organizational units.

Figure 4.1 shows the structure of a corporate AM system. It distinguishes between the external drivers (business environment and stakeholders), corporate management setting policy and strategy, AM focusing on planning and analysis, and frontline execution. The “best practices” model integrates AM throughout an organization by creating functional alignment between successive stages in the treatment of assets and methodological consistency across the various types of assets

Figure 4.1

A Corporate Framework for Asset Management



Modern AM is composed of 12 functional elements. Adhering to the best practices in each of these functional elements will create a documented and repeatable sequence of steps that will optimize asset-related decisions and actions across the organization. “Best practice” AM occurs when an organization has a clearly defined, organization-wide **policy** that is translated into a **strategy** to guide actions. This strategy accommodates **legal, regulatory, and other requirements** and takes into account **risk identification, assessment and management efforts**. The directions set by the



strategy inform the more specific **objectives** and **condition targets** that are used to render asset **plans** and related **financial planning** actionable. These plans guide **implementation and operation** efforts that contain **emergency preparedness** provisions to deal with numerous, varied contingencies that can be anticipated if not forecast with reliability or accuracy. **Information management** systems are designed to support the analytical demands of tracking, aggregating, and analyzing data necessitated by the strategy guidance and represented concretely in plans. A final **management review and continuous improvement** step completes the AM cycle while simultaneously setting the stage for the next round of efforts. These elements are described below.

4.1 Asset Policy

Asset policy reflects a two-fold responsibility of management. First, asset policy includes a high level statement of the intentions and principles for guiding AM in the organization. It is directly linked to the organization's strategic plan and its objectives, but focused on the assets. It also includes references to the legal, regulatory, and statutory requirements that give guidance to the organization. Second, the asset policy lays out the framework or steps for implementing AM. The functional aspects of AM policy establish the accounting rules, the planning/budgeting cycle, the risk assessment requirements, and the stakeholder interface. In sum, it is intended to provide durable guidance to the organization with regard to the principles that guide asset management and the broad structure within which it will be managed.

BPA is one organization that provides clarity on what a policy is and what is required to put one in place. According to BPA, policy states the official position; provides direction on issues in matters affecting individual employees or collective interests and actions. Policies ensure consistency and are agency principles that articulate goals and serve as a basis for sound decisionmaking. BPA suggests that a policy statement contain the following sections:

- a. Purpose
- b. Definitions
- c. Policy or Regulation
- d. Responsibilities
- e. Procedures
- f. References

These thoughts can be applied to create an asset management policy statement.

4.2 Asset Strategy

The asset strategy is the long-term action plan for the assets that is derived from the organization strategic plan and is consistent with the AM policies. In a very large sense, the strategy expresses the desires of the organization with respect to the assets and the



concrete, yet high-level, plans to accomplish the organization's goals. It commits an organization to a course of action. The most fundamental dynamic of strategy is how to close the gaps between current conditions, including capabilities, and the organizations vision of the future.

Strategy development considers:

- Stakeholder expectations
- Future demands for services
- Asset criticality
- Physical condition and capabilities of the assets
- Criteria for comparing options
- Asset-related scenarios, including contingency planning and
- Risks and rewards associated with:
 - Strengths
 - Weaknesses
 - Opportunities
 - Threats

The asset strategy should state the organization's vision of the future, desirable future outcomes, and the broad steps to achieve them.

4.3 Risk Management

Risk management gets to the heart of AM; that is, optimizing the trade-offs between performance, cost, and risk. Best practice risk management leads an organization to understand the cause, effect, and likelihood of adverse events occurring. An adverse event is anything that may cause the organization to fail to meet current or future corporate goals. When this is understood, then actions must be prioritized to control or reduce the risks that are identified. Management is a key word in the phrase "risk management." Management must provide guidance with regard to the risk tolerance of the organization. All activities are then planned and managed with reference to this organization-wide risk tolerance. Best practice organizations typically prepare risk matrices for mapping multiple projects on a severity/uncertainty scale. These matrices inform planning decisions and resource allocation. (See Figure 4.2) In addition, a complete risk management program also provides an audit trail so that when an adverse (or positive) event occurs, the rationale for the decision path can be analyzed the organization can learn from its experiences, and stakeholders can be kept informed.

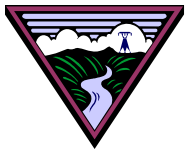


Figure 4.2

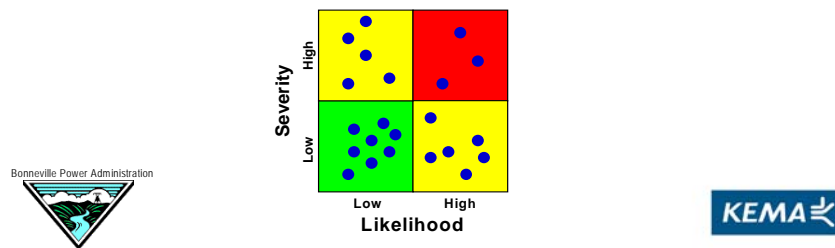
Project Risk Matrices

For each project

- Identify potential bad outcomes if project is not done
- Identify likelihood of bad outcomes (high, medium, low)
- Identify severity of bad outcomes (high, medium, low)

Plot projects on a risk matrix

Examine risky projects for mitigation or approval

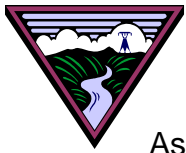


4.4 Legal and Regulatory Mandates

Organizations are subject to numerous legal and regulatory mandates that put boundaries on asset-related decisions. These need to be factored into decisions systematically. This implies that an organization must establish and maintain procedures for identifying and accessing the legal, regulatory, statutory, and other asset management requirements. Other AM requirements may also be appropriate to include such as company-specific requirements (often expressed in the asset policies), trade association guidelines, manufacturer requirements, and asset-related standards. These standards must be communicated within the organization. Procedures must also be created to ensure that the legal and regulatory requirements are being met.

4.5 Emergency Preparedness

The physical assets of an organization can be both the cause of an emergency and the means to recover from one. Consequently, emergency preparedness planning should be factored into asset planning. Emergency preparedness remains a function and a discipline in its own right, but the needs for preparedness need to be carried over to the AM function. What capabilities are desired? What redundancy would be prudent? What inventories are needed to support the assets in an emergency? How much coordination with neighbors is appropriate?



Asset planning needs to address what is needed to prevent an emergency, how impacts can be mitigated if an adverse event occurs, and the role of assets in recovery. Contingency planning has always been a part of utility planning. Under modern asset management, it needs to be taken a step further to ensure that emergency needs are assessed against other choices and built into the asset plan.

4.6 Asset Objectives

The asset objectives make the asset strategies and related corporate intentions measurable. They are the high-level objectives that become the cornerstone to the more-specific condition and performance targets. The objectives are the asset-dependent milestones and performance goals identified in the organization strategic plan. Other sources of objectives can be legal and regulatory requirements, financial imperatives, technology change plans, and stakeholder requirements. However, these requirements and their rationale should also be captured in the organization strategic plan. Examples of corporate objectives include reliability, capacity adequacy, deferred maintenance, customer satisfaction, safety, and cost control. The corporate objectives are then cascaded down to the asset-specific performance targets.

Careful specification of the asset objectives is a necessary step to ensure that AM policies are being implemented, that strategy is actionable, and that performance can be assessed. In order for the asset objectives to serve their purpose, the objectives should be achievable. Financial resources, human resources, and the time available should be sufficient to achieve the objectives. If they are not, then the objective may need to be adjusted or the objectives themselves may need to be refocused toward gaining the time and acquiring the necessary resources. Stretch targets or breakthrough results may be appropriate in some circumstances, but even ambitious objectives should be achievable with the resources available.

Setting targets has implications for cost. In addition, sometimes targets can be in conflict with each other. Therefore, target setting should be an iterative exercise between corporate management and the asset managers. The objectives are the initial “stake in the ground” around which both the specific targets and the optimization analysis will be engaged. If the initially proposed objectives lead to trade-offs between risk, performance, and cost that are undesirable, then the objectives may need to be recalibrated.

4.7 Information Systems

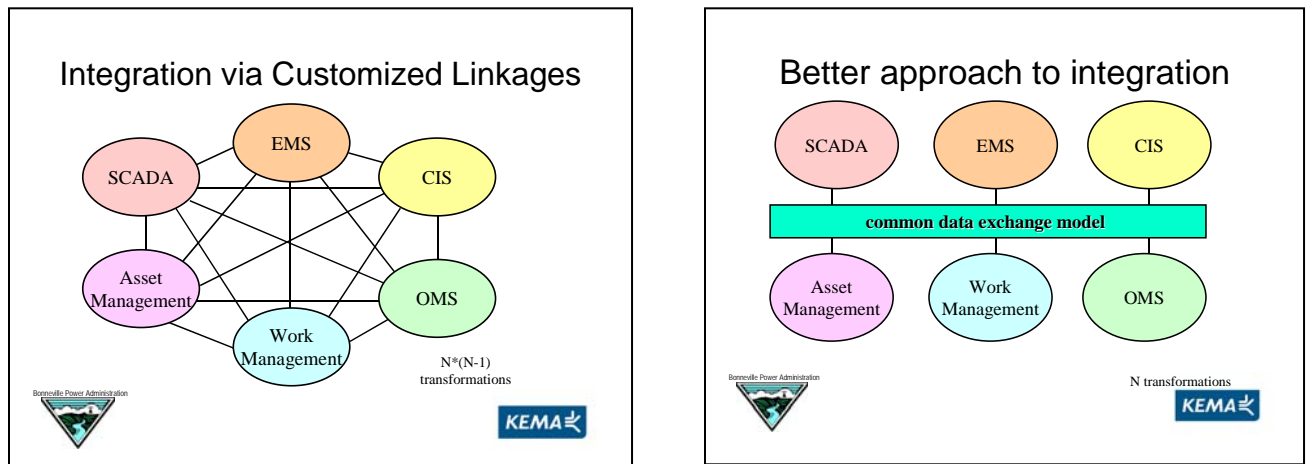
The asset information system should be designed and maintained to support all aspects of asset management. The system shall include asset descriptions, costs, location, engineering data, vendor data, capability, condition, performance, and maintenance schedules and records. The information not only contains data, but it also includes the analytical tools that support asset management. The system shall have the technical and financial information to facilitate lifecycle costing, asset optimization, impacts of



deviations from plans, control of risks, and the implementation of a repeatable, auditable AM process.

A complete asset management system is large and complex. It can include information about outage management system, geophysical information, work management, customer information, asset management specific information, and other company records and analytical tools. Somehow all of this information needs to be integrated. It must be timely as well as be available to the people who need it. The information can be managed by customized individual connections among the various subsystems and platforms or by full integration via a common data exchange model. The right degree of information system integration will vary for each company, but the tendency should be toward more integration rather than less. (See Figures 4.3) Certainly individual staff teams will need specialized asset information of limited use to others in the organization. Full integration of all of these specialized needs would be expensive. At the same time, any data that is kept routinely for record keeping or analysis should be captured in a complete AM information system.

Figure 4-3



A good place to start to build an asset information system is to adopt the concept of an *asset register*. An asset register is the repository of the core asset management information. The following sequence of figures shows the contents of a fully developed asset register. (See Figures 4.4) It starts at the high-level categories and then sequentially illustrates the kind of information appropriate for each category.



Figure 4.4

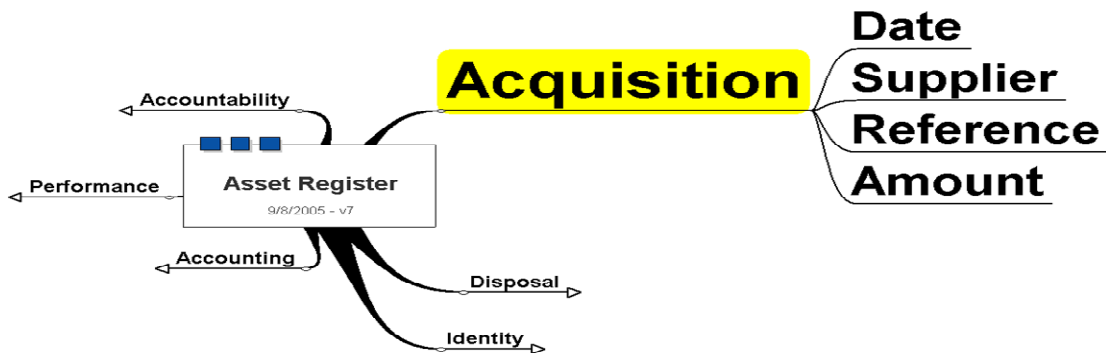
Asset Register



SOURCE: Adapted from the Australian National Audit Office

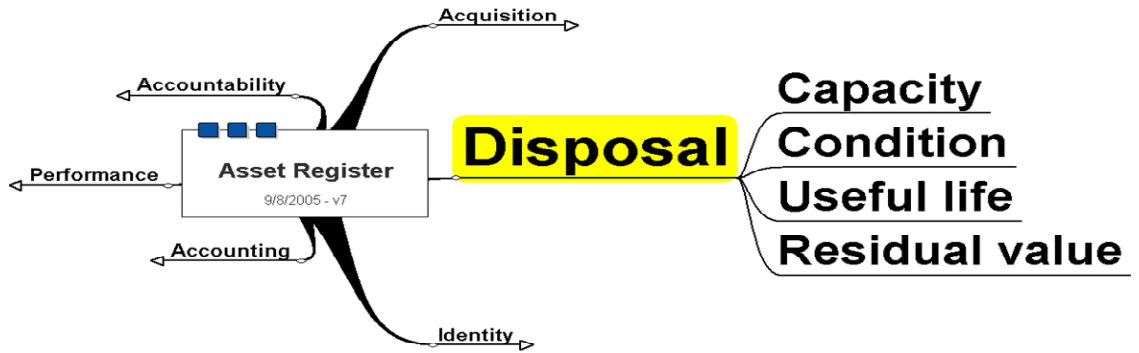


Asset Register: Acquisition

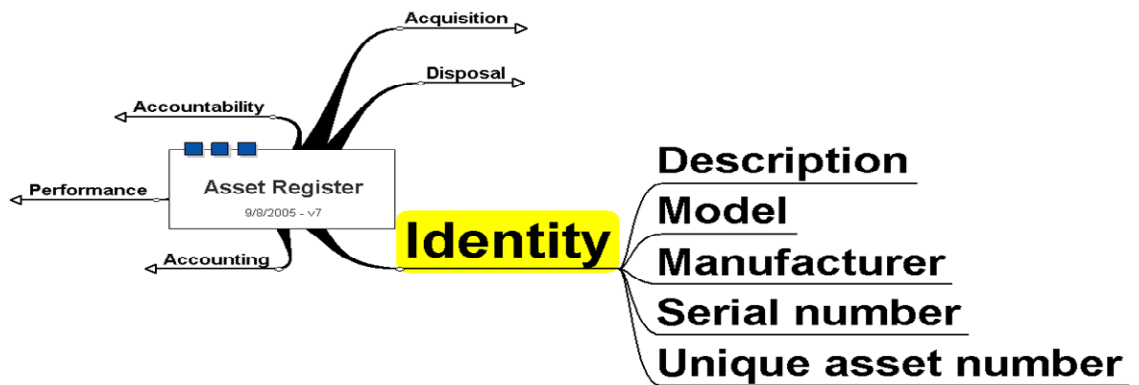




Asset Register: Disposal

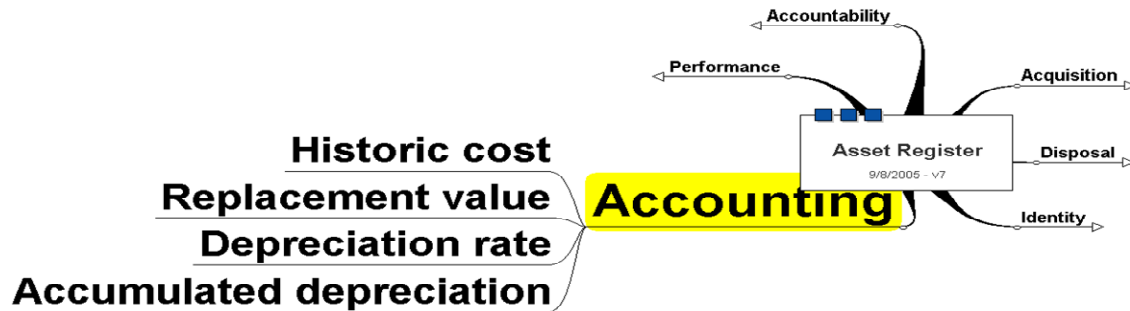


Asset Register: Identity

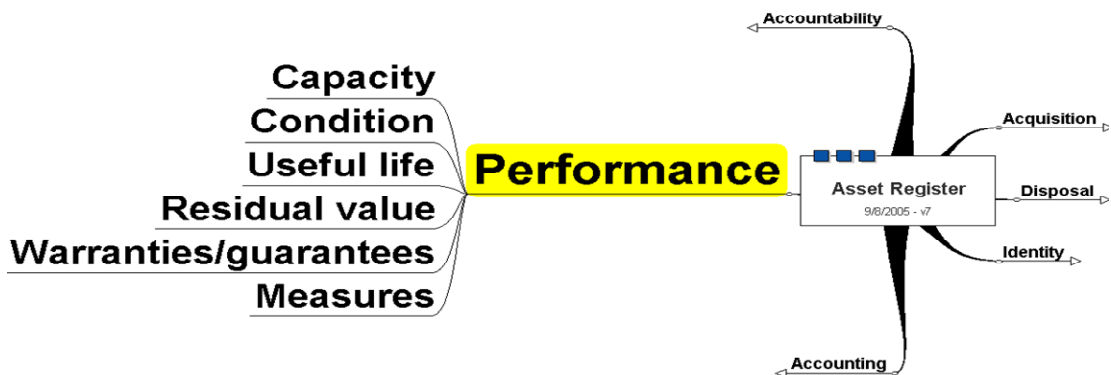




Asset Register: Accounting

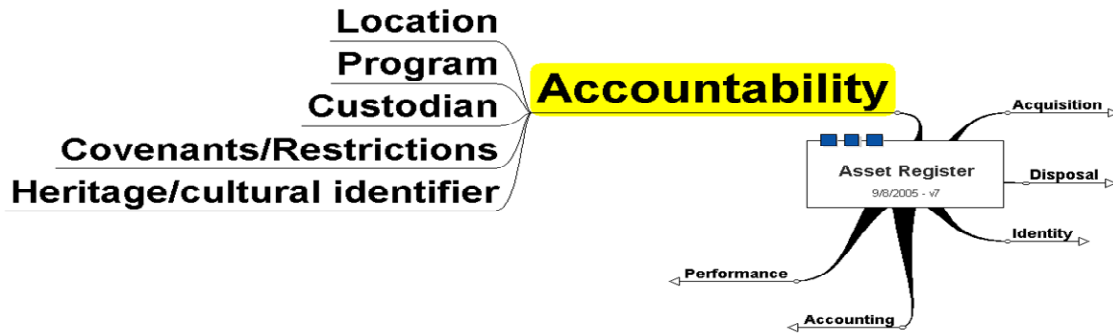


Asset Register: Performance





Asset Register: Accountability

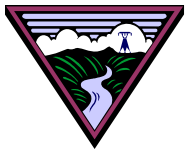


4.8 Asset Planning

A best practice AM program includes the preparation of specific asset management plans for advancing the organization’s strategy and achieving the objectives and targets set for the physical assets. Asset planning is focused on serving the organization’s strategy. More specifically it aligns asset acquisition, capacity, maintenance, decommissioning, inventory management, service quality, and service delivery with the organization’s strategy.

The plans address all elements of AM with consideration of historical performance, asset condition, projected needs, lifecycle costs, financial constraints, scheduling constraints, and cost-effectiveness to achieve the most desirable trade-offs among performance, cost and risk.

As with other elements of AM, the best asset planning practices are “best” when they are appropriate for the characteristics of the subject organization. For example, one transmission utility under significant cost pressure from the regulator uses the following process in its asset planning. First, the company develops future scenarios for the grid taking into account corporate strategy, stakeholder interests, and the regulatory compact. The regulatory compact allows for a fair rate of return on prudently incurred costs. Second, the company evaluates the scenarios from three perspectives:



1. Optimize the current grid at current capacity considering future demand over the next 10 years.
2. Assess the risk of future stranding of assets (a significant regulatory risk).
3. Create the least cost path for a reliable, efficient grid that maintains service quality obligations and meets future growth.

Third, following implementation of the least-cost plan, the company uses KPI's and benchmarking to measure the effectiveness of the plan.

Extending beyond this specific company example, a more comprehensive approach to designing a best practices approach to asset planning builds upon nine steps:

1. Specify Service Parameters

Service parameters are specified in a collaborative process that includes executive management and the asset management team. The process blends together the corporate objectives, customer expectations, and regulatory requirements. These parameters (goals, objectives, targets, etc.) address the primary service categories such as reliability, customer service quality, safety, environmental standards, and financial condition. The parameters should be at a more disaggregated than the high level objectives in order to measure and track performance.

2. Predict Demand

Identify the factors and trends that will determine what demands will be placed upon the assets. This will include a broad array of economic, demographic, technological, and locational factors. The predicted demands should be asset specific.

3. Assess Asset Condition

The capability of an asset to meet the predicted demand depends upon its condition. The age of the asset, the loads placed upon it, and the rate of deterioration should all be considered. What has been learned from condition-based maintenance of the asset? What are the failure patterns of similar assets in the company and in the industry? Formal condition assessment techniques consider historical operations, maintenance records, local conditions, staff knowledge, external influences, and nominal life expectancy. Most importantly, what is the business value of the asset and how is that affected by its condition?

The condition assessment process and spending for rehabilitation or replacement depends upon the:

- Criticality of the asset
- Condition of the asset
 - Age
 - Load placed on the asset
 - Rate of deterioration



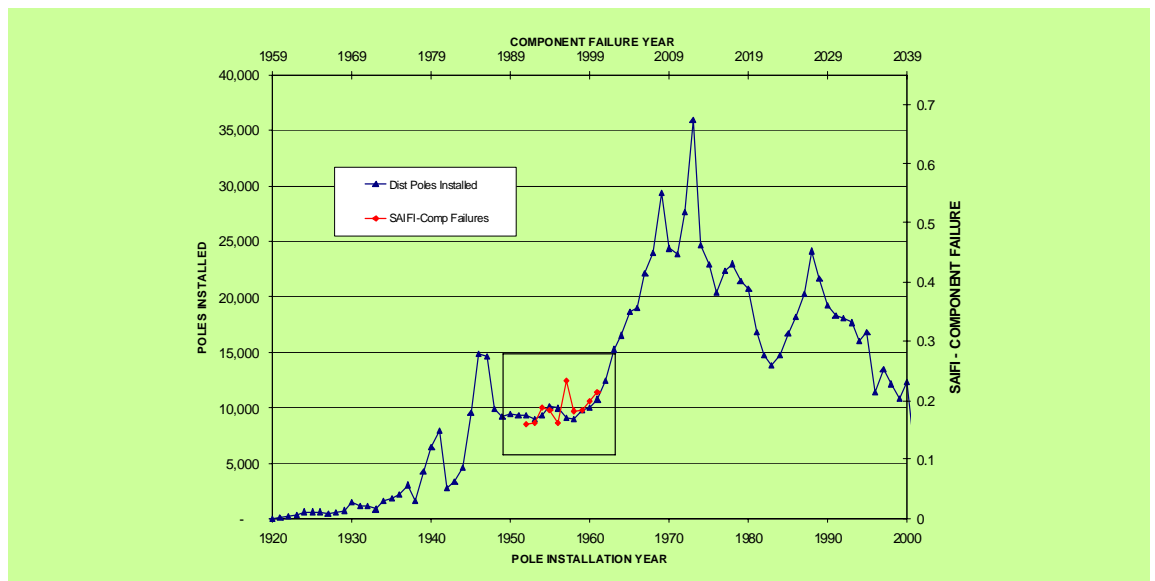
- Failure patterns
- Value of the outcomes to the business

Utilities tend to focus on criticality, condition, and reliability impacts when planning. But the most important consideration is the value of the outcomes to the business. The outcomes must be linked to all of the stakeholder objectives for asset management to be most effective.

The magnitude of the issues raised by condition assessment is enormous. For example, PPL faced a system-wide issue related to the age of its poles. Based upon their own experience and the shape of standardized deterioration curves, they faced the daunting task of replacing a generation of poles. In fact, the number of poles that fell into the age cluster in question was so large that replacing them on a calendar cycle was not feasible. (See Figure 4.5) As the graphic shows, PPL found that at a threshold age of 39 years, poles are more likely to fail. Clearly, condition assessment must play a

Figure 4.5

On Point: Poles By Installation Year



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prominent role in their spending decisions. The same question affects all elements of the utility infrastructure. Optimal spending depends more on condition than it does on the calendar.

4. Predict Capability and Performance

Knowledge of asset condition leads to an assessment of the capability of the asset to perform as required. How many hours of useful life can be expected? What is the probability of failure?

5. Identify the gaps between the predicted demands

Areas of spending need begin to emerge as the gaps between the predicted demands and the predicted capabilities of the assets are analyzed.

6. Identify Risk Exposure

The organization's strategic plan and knowledge of the business environment may raise some risks that need to be assessed. In addition, the preceding gap analysis may point toward some specific risks that need attention. The significance of these risks can only be evaluated when management establishes risk criteria and risk tolerance. The primary risks to be addressed are risks to achieving the corporate strategic objectives. Certainly there are risks that a piece of equipment will fail and managing these risks is the cornerstone of optimizing maintenance. But the significance of a risk is measured in terms of the impact on attaining strategic objectives, not by the probability of an equipment failure alone.

7. Find Assets at Risk and Asset Opportunities

The combination of the gap analysis and the risk assessment leads to the identification of risk mitigating measures. Equipment may need to be repaired, replaced or upgraded. Maintenance strategies may need to be revised. Monitoring equipment health may need to be improved. Performance improvement may also come from taking advantage of some opportunities. Changes in the areas of automation, design standards, maintenance practices, or operations may be appropriate.

8. Consider Nonasset Alternatives

Not all gaps and risks require an asset-centric response. Running to failure may be the best options for some equipment. Then the focus shifts to failure management to protect the corporate objectives. Financial insurance may be the best choice for large and random potential outcomes. Demand management also needs to be considered. Nonasset alternatives can help asset performance stay within capability and operating guidelines, extend useful lives, and manage lifecycle costs.



9. Propose Projects

The single most important step in AM is to create a menu of proposed projects that address the needs linked to the strategic objectives. Unfortunately, even the litany of AM best practice has not addressed this well. Any specific objective can be accomplished with an infinite combination of resources. In addition, there are trade-offs in resources, time, and performance. There may be capital-intensive solutions, labor-intensive solutions, outsourced solutions, accelerated or delayed solutions, and high-performance or acceptable performance solutions. Criteria in the form of an asset management policy are needed to make the optimal set of decisions. Without an asset management policy, individual projects submitted to a ranking scheme will not be comparable. They will include only one cut along the dimensions listed above. Management will be faced with the impossible task of comparing apples and oranges. In spite of all of the complex ranking procedures that can be applied and all of the colorful dashboards that can be viewed on a PC, a ranking system that sorts bottom-up projects will not reflect corporate priorities. Management simply cannot exercise its responsibilities if it must allocate spending based upon discrete project rankings. At a minimum, management and planners must understand the value of alternative uses of the resources, the value of alternative outcomes to the proposed projects, and the significance of the constraints facing the company.

The key to unlocking this value is to go farther upstream to where the project descriptions are created. Changing the process here can give management a richer set of choices and greater ability to address corporate priorities. Instead of asking planners, engineers, and other project developers to submit a single project proposal to address a specific need, ask them to submit a map of options that could address the same need. The map of options would provide information for each of the dimensions that need to be addressed—resources, timing, and performance. What in the past would have been a single project submitted to a ranking system would now be a set of projects bracketing the earlier submittal. This approach breaks down the lumpiness of the choices and creates knowledge of the incremental trade-offs implied by resource allocation decisions.

4.9 Financial Planning and Optimization

Financial planning and optimization is interwoven with the asset planning described above. All of the previous steps in the process are designed to inform decisions. Financial planning and optimization identifies the feasible options, assesses the net benefits of each option to advance the corporate objectives, and selects the bundle of options that maximizes the corporate objectives. Here is where the loyalty to the AM process throughout the organization has its payoff. Optimization is based upon the analysis of the assets and future needs, not the personalities in the budget meeting. Also, here is where the decisions are guided by the corporate objectives, not onsite, out-of-context assessments.

The decision guidelines and policies promote consistent decisionmaking across the company. These decisions are complex. Decisions with different levels of expenditure



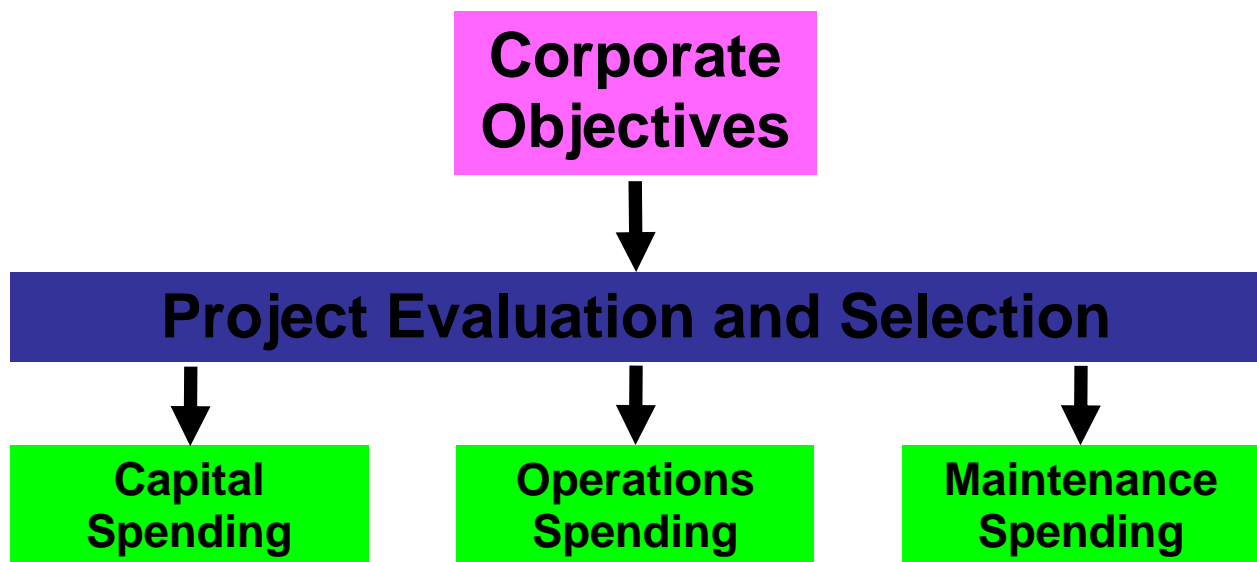
or levels of risk may require different levels of analytical effort. These complex decisions may also depend upon sophisticated analytical tools such as decision trees, net present value, linear programming, net benefit calculations, and real options analysis. Common assumptions must be specified for such variables as discount factors, risk adjustments, cost of capital, time horizons, and other parameters. Criteria must be established for evaluating or ranking the options.

An absolutely fundamental precept that should not be violated is that the financial planning and optimization step should be based upon a lifecycle view. This has three facets.

First, the process needs to recognize the cost and revenue streams related to specific assets. This applies to capital spending decisions for new assets as well as operational, maintenance, and disposal decisions for existing assets. Ownership implies a future cost stream to maintain it and a future revenue stream to pay for it. A corollary of this is that a financial forecast is required. Funds are needed to acquire, maintain, and operate the assets. The financial forecast along with analysis of the implications of the cost and revenue implications of asset decisions are fundamental to knowing whether the assets can be funded and the business model is sustainable.

Second (and implied by the first), capital and O&M need to be considered together (Figure 4.6). Not making this linkage is the equivalent of flying blind. Minimizing costs to achieve objectives implies that all costs are considered.

Figure 4.6



Third, a lifecycle view of asset decisions not only requires that you consider the future cost and revenue streams and understand the net present value (NPV), but it also means that you understand the potential for future decisions affecting the assets. This implies that simply knowing the NPV of a project and using that in a ranking system is



not sufficient for optimal resource allocation. It is often wrong. Traditional NPV calculations, whether they are based on fixed forecasts of net revenues or Monte Carlo forecasts of net revenues, do not account for the choices that management has after an initial decision is made. Management may choose to change the operating parameters of the asset, revise its guidance on risk tolerance, expand future operations, invest in complementary assets, or pursue other options. An optimization process that does not account for this optionality risks making some expensive mistakes or missing some significant opportunities.

4.10 AM Implementation Structure

Modern AM addresses traditional functions but in a better way as part of a common process. Traditional functions include new investment planning, O&M, budgeting, understanding equipment condition, and achieving corporate goals. Modern AM modifies the traditional functions in three ways: seeks optimal corporate performance in contrast to technical performance; puts the cost, performance, and risk trade-offs at center stage; and, works through a new organization design that implements a common view of asset decisionmaking.

AM oriented organizations create an organizational structure with roles and responsibilities that support the alignment of the assets with policy, strategy, and objectives. This not only creates an efficient organization, but it also signals the commitment of executive management to asset management principles. This commitment starts with the appointment of a senior executive to be responsible for the organizations asset management system. This executive then collaborates with a team of asset managers that works to ensure that the assets advance the organization's strategy and that objectives and targets are met. Together, the structure is designed to support a concerted and coordinated effort across the organization.

Implementation also typically requires training. The training ensures that personnel with asset management responsibilities are appropriately qualified. O&M personnel need to understand the AM system and the importance of analysis and reporting. Others may need training on the planning and analysis associated with AM decision-making.

Executive management is responsible for the preparation of a communications plan. These communications should provide all stakeholders (employees, customers, government officials, and others) with the appropriate asset management information.

4.11 Operational Control

Operational control ensures effective management of all activities required to fulfill the objectives of the asset management program. It accounts for the greatest share of the overall level of effort to implement AM. Specific tasks must be controlled including working methods, tactical planning, scheduling, ongoing resource allocation, and hazardous tasks. Supply chain risk must be managed related to equipment design,



safe handling and installation, qualification of personnel, and access control. Plant and equipment life needs to be optimized via O&M procedures, refurbishment, disposal, inspection, monitoring, equipment isolation procedures, and shutdown.

This requires a lot of detailed effort. All of this effort is focused on achieving the targets that translate the AM objectives into actionable control. The targets should be specific, measurable, and achievable. The targets and related phenomenon need to be measured and monitored. Is the system being operated as intended? Are the assets functioning as required? Are activities in compliance with the AM plan so that policies, strategies, and risks are applied and managed? Operational control includes effective procedures for failure analysis and corrective action including reporting, evaluating, and investigating incidents that affect the achievement of the targets. These procedures should flow from documentation to root cause analysis and finally to solutions for the frontline cost/performance/risk optimization.

Presumably spending more on O&M delivers better performance. But, a more focused perspective is equally important. Is the spending being done efficiently? The answer to that question depends upon two things. First, are the defined projects being completed at the lowest possible cost? Second, is the spending on specific assets providing the greatest benefit in terms of the corporate objectives?

The responsibility of the asset manager is to make sure that the spending delivers the greatest benefits. The asset manager must answer how specific assets support the defined objective and how important those specific assets are in achieving the strategic objectives. Professional execution ensures that the defined work gets done efficiently.

One of the indicators of a successful maintenance program is the mix of planned to unplanned maintenance. Preventive maintenance, routine servicing, condition monitoring, and even disposal can all occur on a planned basis. But, as suggest above, too much of a good thing is not cost-effective. Failures should and will occur. Some failures cannot reasonably be predicted or prevented. Some may even be accepted and planned for. Others are not acceptable. If an unacceptable failure cannot be predicted, then the function in question is a candidate for redesign or redundancy. All of these implied trade-offs indicate that optimizing maintenance is complex.

Some companies have adopted goals for the appropriate mix of planned and unplanned maintenance. According to Richard D. Palmer, author of "Maintenance Planning and Scheduling Handbook", an organization that hires a maintenance staff and then has a maintenance policy of only responding to problems cannot exceed 35 percent efficiency in the utilization of maintenance resources. Consequently, allowing 100 percent of maintenance to be unplanned is unlikely to be the correct policy. Alternatively, adopting a maintenance plan to do the impossible, e.g., allow for no failures, would be extraordinarily expensive.

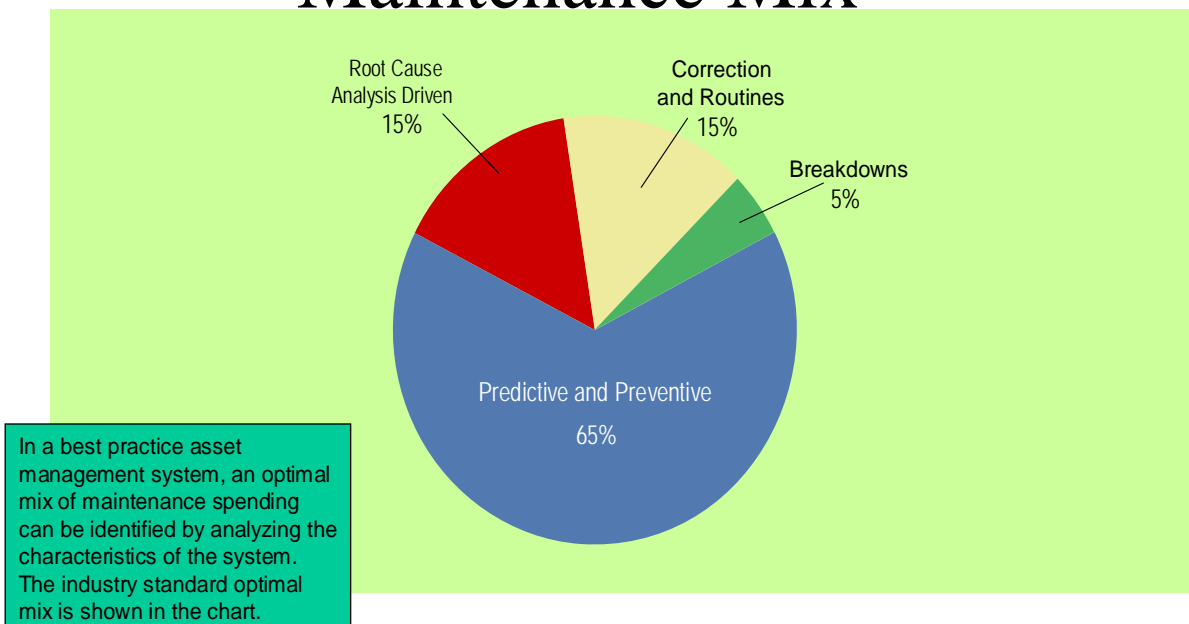
An example of a benchmark target mix, used by some utilities, is shown in Figure 4.7. The world class rule-of-thumb is to have 5 percent of maintenance spending driven by unplanned breakdowns, 15 percent corrective and routine, 65 percent predictive and preventative, and 15 percent root cause driven. This ideal can vary based upon system



characteristics such as adverse weather, a special investment program, or an unbalanced distribution of risks.

Figure 4.7

On Point: Benchmark Maintenance Mix



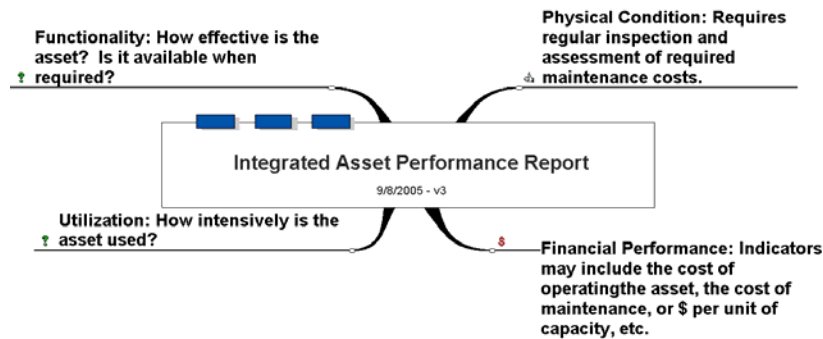
4.12 Management Review

The final step in the asset management cycle is to reassess whether the process is delivering the benefits that were promised. First, are objectives being met? Performance of key metrics needs to be monitored. Are the assets delivering performance and value? The comprehensive story of the effectiveness of the asset can be provided in an integrated asset performance report (See Figure 4.8).



Figure 4.8

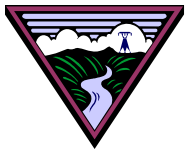
Integrated Asset Performance Report



Second, the final part of this step is to reassess the process itself. Both executive management and the business units responsible for the assets should undertake this. The objective is to seek continual improvement in all processes. Activities to assure this include:

- Evaluate the effectiveness of the AM system.
- Check compliance with the AM plan.
- Assess the effectiveness of the AM plan.
- Assess the viability of the policies, strategies, objectives, and plans for meeting future needs.
- Review the adequacy of the AM assumptions, methods, techniques, funding levels, and funding allocation.
- Evaluate potential changes in the business context and operating environment that can affect elements of the AM process and plan.

This process of continuous improvement can also include benchmarking the process against the practices of other companies. Technology is always changing. Analytical techniques continue to be refined. Outside reviews and networking can provide information to secure the benefits of asset management. Internal reviews are also useful. Onsite discussions with staff to assess all aspects of the program can point to opportunities to improve. Decisions can then be made about prioritizing steps that can deliver even better performance.



5. Gap Analysis

Gap analysis is used to identify the differences between current and best practices. While the term “gap” can be taken to imply a shortcoming, this is not necessarily the implication to be taken from this part of the analysis. The gaps are merely differences between the yardstick and current practices. Some differences will warrant attention and proposals for change while others may be entirely appropriate for the circumstances and characteristics of BPA and its mission. The need to address specific gaps and close them is a management decision based upon the desired characteristics of the future state. That is the subject of the next chapter. This section merely identifies the differences between best practice and the current situation within BPA. Gap analysis is a necessary step in the diagnostic process and subsequently in the development of consistent, efficient, and well-aligned practices for managing the diverse assets for which BPA is accountable.

The approach adopted by the EPIP AM Team proceeded as follows:

- *Preliminary Gap Identification.* Each of the EPIP team members reviewed the information they had gathered in the asset category for which they were responsible. This produced a picture of the comparative, current state of Agency AM. This process also yielded additional information, provided by managers and subject matter experts, about where current practices could be improved or new practices could be created. This information was summarized on a category-by-category basis to produce a description of the major gaps.
- *Refinement of List of Gaps.* The team compared gap descriptions from each of the 7 asset areas and developed a consolidated list of 121 potential gaps, organized by the 12 elements (described in section 4) comprising the AM cycle.
- *Development of Criteria for Asset Management Improvement.* After reviewing literature on best practices, the Team Lead and KEMA Lead prepared a list of 51 AM Criteria that could potentially be used at BPA. The BOB, the Sounding Board, and the full AM EPIP Team reviewed the list. This process identified which of the criteria were considered to be of high priority in designing improved practices here at BPA. Twenty-one of the potential 51 were selected as being high priority. The high priority criteria were grouped into five themes: strategy/vision, governance (including policy), operational control, stakeholder involvement, and spending framework.
- *Assignment of Listed Gaps by Criteria Theme.* The team next worked together to sort the gaps according to the 5 criteria themes. In some instances, there were several critical sub-areas deemed important for purposes of further analysis. The major themes and sub-areas are shown in Figure 5.1. The consolidated list of gaps is shown in Figure 5.2.



**121 Gaps Sorted into Five Priority Areas for Developing
Recommendations
(Figure 5.1)**

- **Governance**
 - Authority and Accountability
 - Policy
 - Internal controls
- **Strategy/Vision**
 - Agency Level Strategy/Vision
 - Risk Management Framework
 - Performance Targets for Physical Assets
- **Operations**
 - Asset Plans
 - Analytical Tools
 - Databases
 - Processes
 - Documentation and Communication
- **Stakeholder**
- **Spending Framework**
 - Budgeting and Allocation
 - Lifecycle costs



Consolidated List of Gaps (Figure 5.2)

Governance

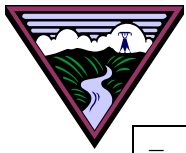
- Across the Agency, governance of AM is not supported by **policies** and systematic, recognized, or supported **internal control** methods, systems, or practices.
- BPA currently has no explicit **delegation of authority** or **structure** regarding asset management. (Although it is implicit in many of the responsibilities identified in position descriptions.)
- Asset management **practices** do not appear to be guided by a unified set of asset management principles, processes, and procedures. Where asset management related policies are found they tend to be business unit centric, isolated, or informal.
- No formal **process** exists for reviewing and refreshing asset strategies and performance.
- BPA has no agreed upon definition of what constitutes an **asset**.

Strategy/Vision

- Absence of an Agency **strategy and vision** of the future sufficient to guide asset strategy development
- No high level statement from executive management on the **intentions and principles** regarding asset management.
- Lack of asset-specific, **long-term strategies** and plans for managing assets: CGS (Agency strategy and role, life-extension), TBL, hydro, F&W, EE (distinct from Council), IT, TBL nonelectric facilities, HQ-905.
- Absence of Agency-level guidance regarding **long-term objectives** to guide cost/performance/risk trade-offs and performance targets.
- Assets are not managed in the context of an Agency **risk management** plan that would include guidance on risk tolerance

Operational Control

- Asset Planning and Analytical Tools
 - Asset **plans** do not exist
- Tools do not exist to **evaluate** long-term value, risk, or alternatives with all projects/programs on a comparable basis
 - No established process or systematic framework for **course correction** for investment spending.
 - **Information systems** are inadequate to perform desired asset management processes (data and analytical tools).
- Processes
 - The use of **root cause analysis** is inconsistent when investigating equipment or asset failures.
 - We have no assurance that **inspection** of nonelectric buildings is being done or that it is being connected to preventive or corrective actions.
 - No formal process exists for incorporating **BPA viewpoints** into the CGS asset strategy.
- Databases
 - Hydropower databases are **not easily accessible**, limiting their effectiveness in supporting decisionmaking.
 - BPA does not have **direct access** to Corps and Reclamation asset databases.
 - There is no overall **asset registry** for IT.
 - The database on EE does not contain information on **asset performance** over time.
 - There is insufficient TBL asset information or performance data available to assess historical **asset performance** effectively.
 - Building information is incomplete and located in multiple **unconnected and inconsistent** databases.
- Documentation and Communication



- There is no **central repository** or process for **monitoring** and **disseminating** the legal, regulatory, and statutory requirements associated with the assets (currently being addressed by the PDB, O&M, and supply chain EPIP studies).
- Mechanisms to **communicate** building-related regulations are not adequate to assure that information reaches facilities staff in the regions.
- No **communication plan** exists to address asset issues.
- No formal **training** program exists for asset management planning and analysis.
- The Agency lacks sufficient communication and coordination of the asset implications of the **emergency preparedness** program.

Stakeholder

- There is no formal or documented process for incorporating **stakeholder viewpoints** into the asset management strategy. Discussions that do occur are dominated by near-term financial/rate considerations and do not take a systemic, holistic approach to asset management strategy reflecting costs, benefits, and risk trade-offs as well as regulatory compliance requirements.

Spending Framework

- BPA's budgeting process lacks a consistent, portfolio-oriented **framework** for explicitly linking funding and staffing levels with the performance of its physical assets.
- Assessment of **O&M costs** is not integrated with investment decisions.
- Absence of a process to **recalibrate funding decisions** as conditions change over the course of the budget year.
- Lack of a common framework for making **resource trade-offs** across asset categories.
- Across the Agency, asset costs are not uniformly developed and tracked in relation to their associated **lifecycle costs**.

- *Force Field Analysis.* Members of the EPIP team conducted a force field analysis of the information collected during the interview processes for the seven asset categories covered by AM. Force field analysis is a formal methodology for assessing the factors that help or hinder an organization's efforts to bridge the distance between current and best practice. The EPIP team applied this methodology to the gaps between current practice at BPA and best practice in the industry. For each of the gap themes, the team prepared a list of driving and restraining forces. These driving and restraining forces consist of political, economic, fiscal, organizational, and risk-related factors that would increase or decrease the likelihood of the gap being closed. The team also assigned weights to indicate their relative importance. Finally, the team considered which forces could or could not be altered, and which could be the subject of slow or rapid change. Figure 5.3 shows the driving and restraining forces that the team identified.

By identifying driving and restraining forces, this kind of analysis begins to reveal action items for moving forward. The forces favoring change can be strengthened. The forces inhibiting change can be counteracted. The AM EPIP Team first developed such courses of action for the key gaps under each of the criteria themes. These were in turn aggregated and integrated into a set of overall recommendations for the Agency. The recommendations are the subject of the next section.



Force Field of the Current State (Figure 5.3)

Driving Forces for Change	Restraining Forces Inhibiting Change
<ul style="list-style-type: none"> • The Administrator and the BOB favor increased commonality in asset management, financial reporting, and evaluation. • BOB desire for enhanced management control via clarity of roles, responsibilities, and accountability • TBL and PBL are highly motivated to adopt asset management best practices that will be applied consistently across business units • BPA already employs the balanced scorecard that can facilitate the development of area-specific asset management strategies. • BPA is implementing Enterprise Risk Management and establishing risk management policies and procedures that will be applied consistently across business units. • The adoption of a formal life-cycle methodology for asset management could increase the usefulness of risk management, balanced scorecard, and budgeting efforts. • BPA faces increasingly stringent laws, regulations and policies as well as pressure to formalize process design (e.g. SOX/A-123, EPIP, personnel appraisal system, Energy Policy Act) • BOB wants to optimize capital allocation across business units and has expressed frustration in the past with the lack of comparability in budgetary information offered by business units • The BLs understand the need for actively pursuing relevant long-term targets • Performance contracts are supposed to have <u>a line of sight</u> connection to agency objectives • Cost-based rates requirements clearly mandate a cost-minimization strategy that necessitates financial controls • Customers and constituents want open and transparent access to BPA capital budgeting decisionmaking. 	<ul style="list-style-type: none"> • Poor linkage between strategy, tactics, operations, and process • Unclear roles/responsibilities of owner, operator, stakeholders • Diversity in availability and effectiveness of asset management methodologies (e.g. life-cycle cost) from asset area to asset area • More staff and resources likely to be required to implement a transition to asset management and to create an asset registry. • The current lack of internal controls enables micro-management styles and preferences (Not relying upon systems, processes or organization). • BPA culture is hostile to internal controls and instruments perceived as burdensome bureaucracy. • Mandated consistency could be perceived as a threat to the autonomy of BLs • For some asset areas BPA has limited control and therefore potentially limited discretion over any framework for budgeting. • BPA skill deficits (and lack of standardized procedures) in process design and policy writing, and financial/economic analysis. • Lack of data to support an asset based view of investments for some business units and differences in approach among those that do have such data (lack of a unified methodology across all asset areas) • Status quo vested interest - ambiguity in authority empowers informal expansion of authority and protects against accountability. • Lack of coordination between TBL and PBL tactical measures as they pertain to agency strategic measures ever mindful of SOC. • BPA's balanced scorecards are largely task-oriented, not strategic • Divergent and conflicting interests amongst stakeholder groups



Bonneville Power Administration





6. Future State Solution Design

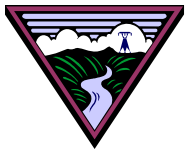
The recommendations of the AM EPIP are the product of the review of current state of AM at BPA, the description of best practices in the industry, the identification of the disparities between BPA practices and best practices, and, finally, an assessment of the priorities within BPA.

The AM EPIP places special emphasis on designing its recommendations to accomplish the objectives established at the outset and the priorities that were identified during the process of completing the work. The team's charter states, "Asset Management (AM) is a relatively new initiative at BPA. It is being considered to improve the balancing of cost, performance, and risk to physical assets; align corporate objectives with spending decisions affecting physical assets; and to create a multiyear asset plan based on rigorous and data-driven processes. The AM EPIP is being done to demonstrate to BPA, its customers, and its stakeholders that it has a transparent repeatable process for effectively managing the physical assets of the FCRPS."

The recommendations are also linked to key agency strategic objectives as identified in the Agency balanced scorecard:

- S9: FCRPS assets are managed to protect BPA ratepayer and federal taxpayer interests for the long-term.
- I1: Effective cost management (with an emphasis on best practices, innovation, and simplicity) through our systems and processes.
- I2: One BPA consistent with SOC.
- I3: Risks are managed within acceptable bounds.
- I5: Collaborative relationships with customers, constituents, and tribes are supported by our managing to clear, long-term objectives with reliable results.
- I6: BPA's processes, decisionmaking, and performance are transparent.
- I7: Decisionmaking reflects consistent application of specified criteria.

Finally, Chapter 5 of this report described the priority identification exercise that the team conducted with the Agency management team. This guided the prioritization of the gaps and the organization of the subsequent analysis. Here the priority criteria, as identified by management and the EPIP team, provide a clear Vision for AM as BPA. The Vision for AM is shown in Figure 6.1.

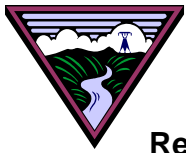


VISION FOR ASSET MANAGEMENT AT BPA (Figure 6.1)

Governance	<ul style="list-style-type: none"> • BPA is an example of best practices • Management is accountable • Strong management support for asset decisions
Strategy/Vision	<ul style="list-style-type: none"> • Alignment between asset management and the strategy and future vision of BPA • Asset decisions are consistent with the long-term needs of the region
Operations	<ul style="list-style-type: none"> • Current condition and performance of the asset and the implications for meeting BPA’s mission are understood • Asset plans are documented • Asset decisionmaking is objective • Operating performance meets targets
Stakeholder	<ul style="list-style-type: none"> • Positive perception of BPA’s asset management
Spending Framework/Capital Allocation	<ul style="list-style-type: none"> • Common, centralized framework for prioritizing spending across BLs and optimizing both capital and O&M spending • The consequences of asset decisions on financial parameters and service levels are understood • AM framework that considers the trade offs across stakeholder interests • Life-cycle costs of an asset decision are understood • Mature risk management program • Framework that provides auditable and defensible decisions

In addition to the broad AM mandate, the team was also assigned the task of developing improvements to the current annual capital allocation process. To fulfill this requirement, the EPIP team considered how a proposed capital allocation process as part of the AM framework would address:

- the availability of potential funding for projects, accommodating the need for sustainable capital through 2018;
- optimizing the mission-based objectives of the capital projects, minimizing project costs to the extent possible while achieving low rates, system reliability, environmental stewardship, and overall regional accountability; and
- The trade-offs among projects competing for the same funds.



Recommendations: Introduction

The Vision for AM sets the stage for specific recommendations. The recommendations result directly from the analysis of the gaps that exist between the best practices and current state. The challenges are getting the correct sequences to the recommendations and deciding how aggressively BPA pursues the necessary improvements.

The schedule for implementing the recommendations is directly affected by the desire to make a creditable case that BPA is effectively managing the FCRPS resources. This is critical for the public process that will support the agency's joint power and transmission rate processes in fiscal year 2009. The agency could choose to slow down the recommended implementation, but implementing AM sooner than the recommendation is not feasible.

A rational decision to implement the recommendations as outlined below ought to be based on an understanding of the expected benefits and costs. Based on industry literature on expected benefits of a strong AM regime, we should expect:

- Tighter linkage between the asset and the strategic objectives of the organization,
- Instituting a more tightly defined set of criteria for making asset-related decisions,
- Approaching asset-related decisions holistically across the organization to ensure that limited resources are optimally allocated, and
- Greater specificity around roles and responsibilities for asset planning and care.

Over the years, BPA and its asset-owner partners have made significant advancements in collaborating to make improvements in managing the assets of the FCRPS to meet the diverse needs of our stakeholders, including Treasury and OMB. The best practices that exist today in the industry have surpassed the practices we currently employ. The AM EPIP team found a significant number of gaps between our current practices and the advancements made elsewhere in the industry. Most significantly, we found great diversity in how asset decisions are approached at BPA across different asset categories.

The agency now has the opportunity to apply the industry's improved approaches and practices in asset management to maximize the value of the FCRPS assets to our stakeholders. By adopting the recommendations in this report we expect to achieve tangible benefits for our stakeholders such as cost reductions, improved performance of our assets (e.g. hydro output, hydro availability, transmission reliability), lower rates and improved environmental results and compliance. It is too early in the process to quantify these benefits.

It is easier to estimate the cost of implementing the near term recommendations. Accordingly, the 2006 calendar year recommendations have been scoped and designed to minimize the need for increased budgets. Additionally, the resulting work in calendar



2006 is designed to produce the maximum amount of information on expected out year benefits and increased costs for FYs 2007 and 2008. A key recommendation is that our Internal Audit group does a review in November 2006 of the Agency's progress in implementing the recommendations so that an informed decision can be made with respect to continuing to implement the recommendations as outline in this EPIP.

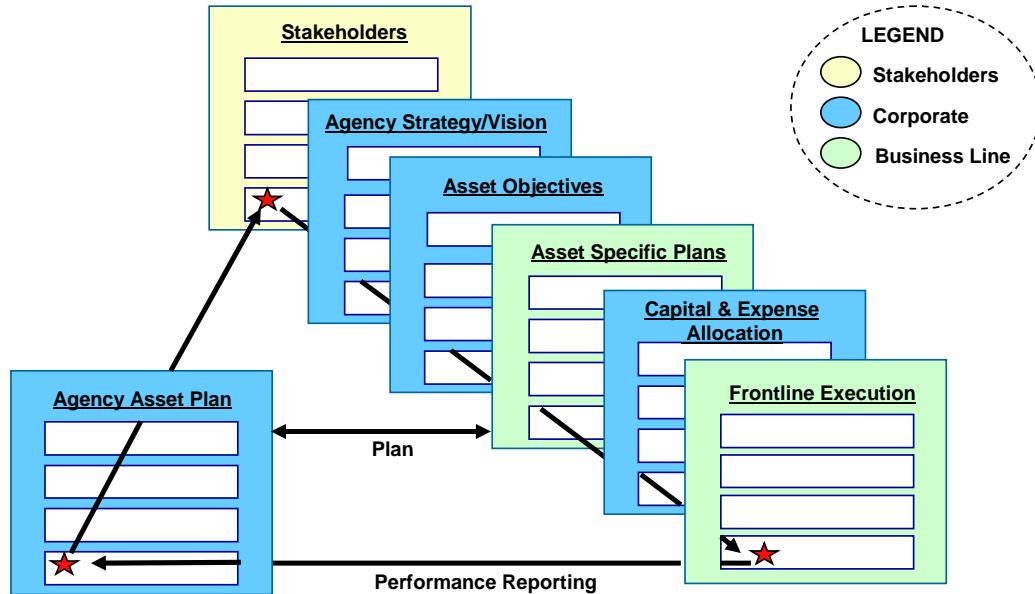
As designed, the agency's asset manager function may take up to 4 FTE to implement. There is no budget set aside to implement an agency AM function. Both transmission and power will need to spend around \$350,000 to implement the recommendations exclusive of money necessary to acquire and implement agency strategy and capital allocation software. Power has already budgeted for the necessary funds for FY 2006. Transmission has not specifically budgeted for AM though funds have been budgeted for other work that is being applied to the AM function. Both transmission and power believe that FTE can be made available by reprioritizing other work.

Best practice asset management includes a "line of sight" connection between stakeholder interests and corporate strategy, planning, and execution. The Asset Management EPIP recommends that this idea be the core of the future state. Figure 6.2 illustrates this. The Agency assesses stakeholder and corporate objectives and then provides guidance for asset planning. The business units with direct asset responsibilities prepare the asset specific plans. The budget funds the plans. "Funding the plans" would include the capital allocation and expense process with the appropriate prioritization and risk assessment. The BLs then implement the plans with the available financial resources. The individual asset plans and the associated frontline execution performance are consolidated into the "one BPA" asset plan.



Figure 6.2

Asset Planning and Decision Making Line of Sight



Bonneville Power Administration



The following sections are the specific recommendations. They are arranged according to 5 categories of Governance, Strategy/Vision, Operations, Stakeholder, and Spending Framework/Capital Allocation.

Recommendations: Governance

1. Agency establishes Agency asset manager position:
 - a. Responsible for agency asset strategy and policy including “what” software tool(s) are needed to support strategy and policy, the Agency Asset Plan, and performance of agency’s AM system;
 - b. Responsible for coordinating AM across the agency;
 - c. Prepares agency asset plan based on individual asset plans; and
 - d. Responsible for continuous improvement in Agency’s approach for evaluating capital projects/portfolios. Recommendations are made to Capital Allocation Board (CAB). COO approves methodology advanced by CAB.



2. Agency establishes Asset Managers for each asset category (Transmission; Hydro; CGS, IT, nonelectric buildings; EE; and F&W). Asset Managers by Asset category are responsible for asset planning and plans; implementing asset investment strategy and “What” additional enabling tools; and evaluating asset performance and condition.
3. Establish an Agency AM Council consist with SOC to facilitate a coordinated agency AM function. Council to be comprised of Agency Asset Manager, each asset category asset manager, and CRO designee.
4. AM Council assists Agency Internal Auditor in evaluating progress of Agency’s AM effort by end November 2006. The evaluation is to provide for re-definition/re-specifications of EPIP recommendations for subsequent years implementation. It should test relative benefits given resource requirements. Recommendations resulting from the evaluation are to be made to COO.
5. Administrative Process:
 - a. COO designates interim agency asset manager at conclusion of EPIP study. Interim agency asset manager creates Position Description (PD) for Agency Asset Manager and for one additional strategist and works with COO to fill positions on permanent basis by close of second quarter of FY 2006.
 - b. COO decides on appropriate organization placement of Agency Asset Manager and FTE to support responsibilities by close of second quarter of FY 2006.
 - c. Executives designate interim asset category asset managers after collaborating with COO on selection. Interim asset managers are selected in February 2006. Interim asset managers will assist in preparing PD’s with appropriate supervisors. Position management must account for changes that may result from 2006 evaluation process (Governance #4).
 - d. Agency Asset Manager works with COO to establish draft Agency policy for AM including delegation of authority and submits to VP of Employee and Business Resources to run approval process by March 31, 2006. Policy is effective by March 2006. Policy is to be consistent with recommendations adopted as part of AM EPIP.
 - e. COO establish the appropriate agency wide organization structure that facilitates implementing AM function as part of agency reorganization effort in FY 2006.
 - f. Agency Asset Manager prepares charter for AM Council in collaboration with other asset managers and CRO designee by March 2006. Charter is reviewed by COO.



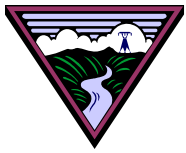
- g. Agency AM Council is active by March 2006.
- h. Incorporate AM responsibilities into individual performance contracts at midyear review of FY 2006 to assure accountability. COO has lead.

Recommendations: Strategy and Vision:

1. Adopt a 2 year strategy development and budgeting cycle and begin with budget cycle in FY 2006 followed by a strategy cycle in FY 2007. Strategic Planning and CFO implement new 2 year approach. (See Appendix 2 for detailed 2 year cycle timeline for FYs 2006-2011)
2. Create an Agency strategic plan, including an Agency vision of the future between November 2006 and November 2007 (next Agency strategic planning cycle). Decisions on strategic plan are completed by February 2007 to guide AM for FY 2008. Specifically identify and assess asset risk tolerance from an Agency perspective. Strategic Planning has lead in collaboration with Agency Asset Manager and CRO.
3. Agency strategic planning group develops long-term BPA strategic objectives, to include performance expectations and agency asset targets (level 1 pbviews input for FY 2008 by April 2007),
4. In FY 2007 prepare AM strategies for all asset categories guided by the Agency strategy (available by March 2007). The asset strategy includes a vision, strategic intent, and an overview of asset condition, identification of performance criteria and targets, and key initiatives to address the vision. Discuss progress at regular BL management committee meetings. AM strategies are prepared by Asset Category Asset Managers. AM strategies completed by July 2007.
5. Finalize the Agency asset strategy based on the individual asset category strategies by September 2007. Agency asset strategy is prepared by Agency Asset Manager. Asset Manager prepares the agency asset strategy in collaboration with Asset Category Asset Managers.
6. Incorporate Agency strategy into the agency-balanced scorecard with line-of-sight supporting objectives at all levels of agency for FY 2008. Agency Asset Manager works with Strategic Planning to complete and integrate into Agency planning process and documents.

Recommendations: Operations

1. Define the strategic physical assets for hydro and transmission within 90 days of AM EPIP final report. The final recommendations are forwarded to BOB by the Agency Asset Manager. Work product is collaboratively prepared by asset managers and CRO designee.



2. Establish an asset registry for these assets to provide sufficient data for asset planning in 2007. Asset Managers are responsible for the registry. Asset Managers collaborate with EPIP PMO to assure alignment with Supply Chain, O&M, and PDB EPIP's.
3. Develop asset plans.
 - a. For hydro, complete 2 prototype asset plans for Black Canyon and Dworshak by end of March 2006. Prepare an Agency assessment of these completed prototypes consistent with Agency needs and decide how to move forward on additional plans. Subject to this assessment of these pilots, complete 4 additional Corps and Reclamation project asset plans by September 2006. (Choice of the additional projects should satisfy specific BL and Agency needs including being connected to evolving/broadening this program to other regions and distributing associated workload amongst them.) Hydro's asset manager in collaboration with the Agency Asset Manager has lead responsibility to assure value to Agency.
 - b. For transmission, after completing the Asset Definition and Asset Registry, and after completing the first 2 hydro plans, complete 2 asset plans by September 2006.
 - c. Complete all asset plans for remaining hydro and transmission assets subject to first quarter FY 2007 review of AM program. Complete asset plans by April 2008. Asset plans are completed by hydro and transmission asset managers subject to agency requirements established by agency asset manager.
 - d. Define assets for the nonelectric buildings, create an agency inventory of nonelectric buildings, and develop a condition assessment format and methodology in FY 2006, complete the condition assessment of all nonelectric buildings in FY 2007, and begin development of asset plan in FY 2007.
 - e. Asset plans for other assets will be considered upon completing the first year review of the asset program in the first quarter of FY 2007.
 - f. Draft agency asset plans available for FY 2008 public comment period for capital and expenses. Final agency AM plan is completed in August 2008 when Administrator makes final budget decisions.
 - g. Agency Asset Manager reviews asset category plans to implement Asset Plans by close of FY 2008.
 - h. Asset Plans are implemented in FY 2009. Asset Manager for each asset category is responsible for assuring implementation.



- i. By September 2007, AM Council will recommend to the COO draft assets specific performance and condition targets that meet agency level one targets.
 - j. Final performance and condition targets that cascade from level one pbview targets through asset specific asset targets exit by September 30, 2008.
6. Emergency preparedness:
- a. Prototype asset plans need to explicitly consider agency emergency preparedness implications in the areas of prevention, minimizing adverse affects and on recovery;
 - b. Emergency Preparedness is explicitly considered in the asset allocation process for FY 2008; and
 - c. Supply Chain EPIP, PDB EPIP, and O&M EPIP have a coordinated approach to emergency preparedness in their recommendations.
- The asset category asset managers have the lead for preparing asset plans. The agency asset manager will incorporate emergency planning in the FY 2008 capital allocation methodology and Strategic Planning has lead for coordinating the EPIP's.
7. AM Council will recommend training to exploit the benefits of modern AM. The first recommendation is due by March 2006 to be considered at mid-year reviews.

Recommendations: Stakeholder

Adopt a routine, periodic and integrated process for interacting with stakeholders on AM when stakeholders are reviewing BPA programs. The first public process is Summer of FY 2006 for capital program. Process should coincide with transmission's Program in Review and include public affairs and communications aspects of stakeholders relations. Process should follow in FY 2008 and in a "One BPA" process based on agency asset plan and will include capital and expenses. CFO is responsible for implementing process with Stakeholders.

Recommendations: Spending Framework/Capital Allocation

1. Standardize financial analysis requirements across asset categories in FY 2006 for use in FY 2008 budget process. CFO in collaboration with Asset managers is responsible. (A recommended decision package is shown in Table 6.1)
2. Define end state capital allocation process with goal of full implementation in FY 2008. Recommend an approach for FY 2007 that is transition to the end state approach. Make recommendation in timely fashion that doesn't delay



the FY 2007 Call Letter of the CFO. Include both recommendations in final report. (Additional detail on the call letter recommendations are shown in the following section.)

3. Implement first phase of capital allocation methodology in FY 2006. Phase 1 is to be implemented by CFO.
4. Put agency strategy and capital allocation software in place in FY 2006 and calibrate to agency needs as defined by agency spending framework recommendations for use in FY 2008 budget process. Strategic Planning is responsible.



FUNCTIONAL ROLES AND RESPONSIBILITY (Figure 6.3)

	- Agency -	- Asset Category -
Agency Strategy	●	☉
Agency AM Strategy	●	☉
AIS Tool	●	☉
Other Enabling Tools	○	●
Asset Plans	◐	●
Aggregated Asset Plan	●	☉
Asset Plan Implementation	○	●
Performance Evaluation of Business Line Processes	☉	●
Performance Evaluation of Asset Management System	●	☉
Stakeholder Involvement	●	☉

Legend

● = Lead Responsibility

◐ = Guidance and Approval

☉ = Collaboration

○ = Coordination & Information Exchange



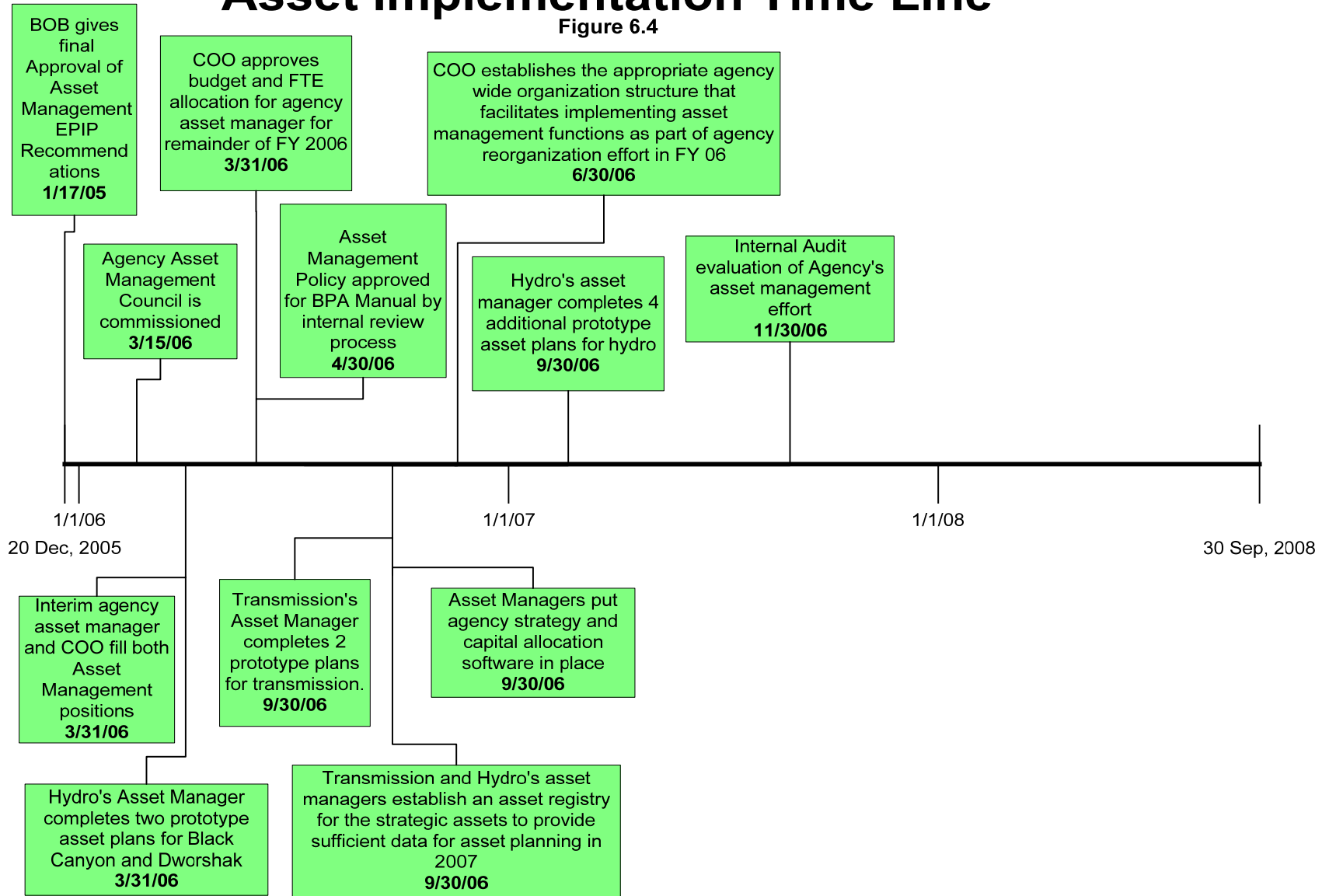
Recommendations: Timeline

Figure 6.4 details the critical milestone that must be met to implement the AM recommendations. A more detailed list of milestones is in the Appendix 3. This list of milestones places the new AM requirements in the context of agency strategy planning and budgeting processes.



Asset Implementation Time Line

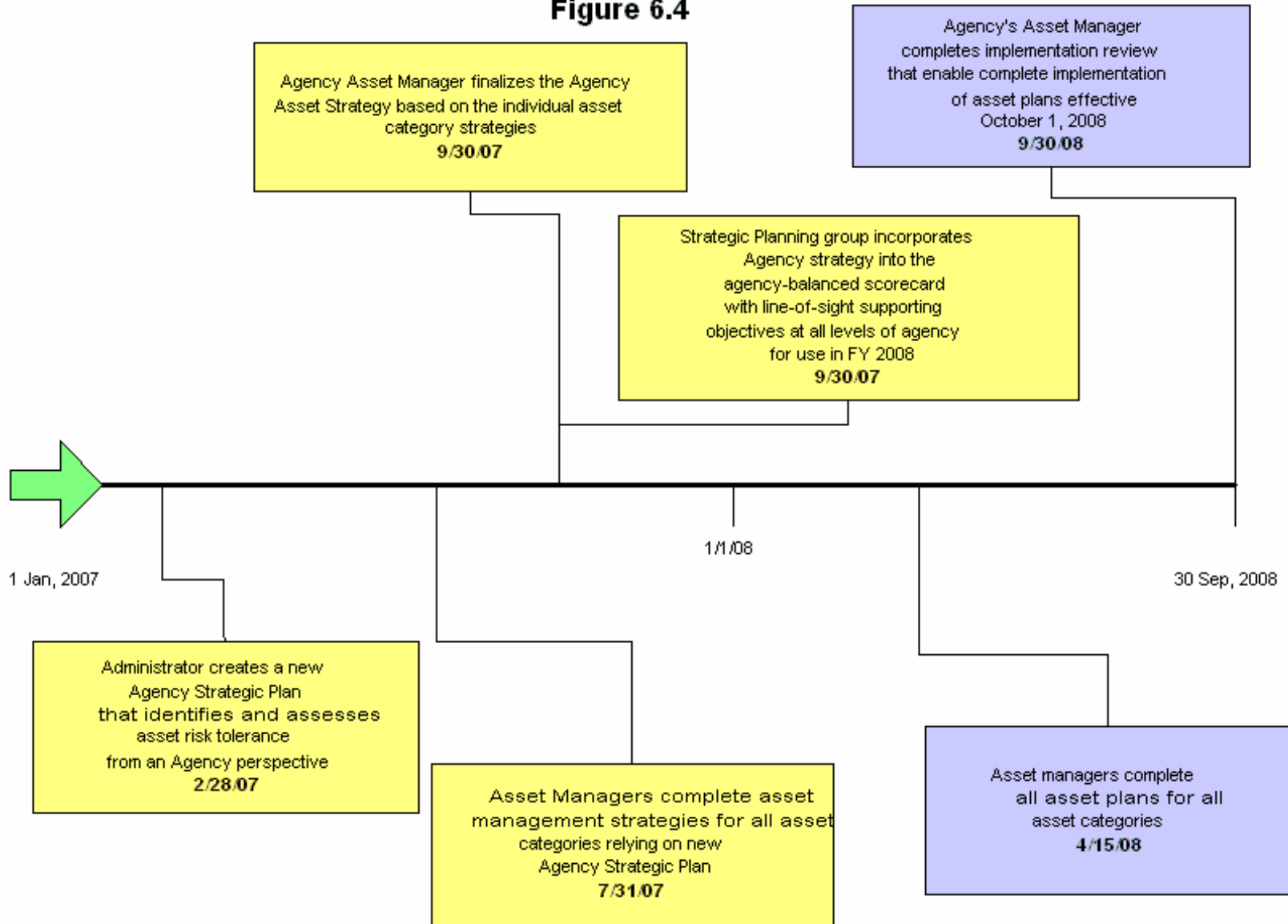
Figure 6.4






Asset Implementation Time Line

Figure 6.4





Appendix – 1

	Capital Investment Program Decision Support Document 2.2	Date: <input type="text"/>	Proj. Mgr.: <input type="text"/>									
		Revision: <input type="text"/>	Proj. Rep.: <input type="text"/>									
Fill in the yellow shaded boxes only												
Project:	Bonneville	Unit(s):	5									
Proposed Project Start Date:		5-Aug-2003										
Subagreement Title:		Example										
Estimate	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	Total	
X Phase I Costs (\$000)	\$25.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$25.00	
X Phase II Costs (\$000)	\$0.00	\$500.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$500.00	
Total											\$525.00	
Date Expense Portion Sent Forward by CWG for Approval:		Approved by JOC (Initials):		Capitalized								
		Date JOC Approved:		Expensed								
Description of Proposed Project (Check what type of effort, provide background on condition of affected equipment, etc.)												
Check which Applies:	Return Failed Unit	<input type="checkbox"/>	Generation Reliability	<input checked="" type="checkbox"/>	Efficiency Improvement	<input type="checkbox"/>	Auxiliary Equip./Other	<input type="checkbox"/>				
Phase I Description: (Enlarge or shrink the box to accommodate description)(Use Alt-Enter for a return)												
Phase II Description: (Enlarge or shrink the box to accommodate description)(Use Alt-Enter for a return)												
Alternatives Considered												
Justification / Risk if not Pursued / Material Condition Reasons												
Status / Notes												



Project	Unit(s) #	Project Cost Estimate (\$000)									
Bonneville	5										
Subagreement Title		Example							Fill in the yellow shaded boxes only		
		Fiscal Year									
		Fill in Start Year Only									
		FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Phase I - Concept through Ready to Advertise/Award (\$000)											
1.0 Project Management		\$25.00									
2.0 Engineering/Study											
3.0 Engineering and Design											
4.0 Contracting											
5.0 Project Support											
6.0 Other											
Phase I Total		\$25.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Phase II - Advertise/Award through Construction Completed (\$000)											
1.0 Project Management											
2.0 Engineering during Construction											
3.0 Contracting											
4.0 Supervision and Administration											
5.0 Project Support											
6.0 Contract (break apart if appropriate)			\$500.00								
6.1											
6.2											
6.3											
6.4											
7.0 Other											
Phase II Total		\$0.00	\$500.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Phase I and II Total (\$000)		\$25.00	\$500.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
The Phase I and II Totals are automatically inserted as costs on the Valuation sheet										Grand Total	\$525.00



Project <input type="text" value="Bonneville"/>	Unit(s) # <input type="text" value="5"/>	Investment Benefits	
Subagreement Title <input style="width: 100%;" type="text" value="Example"/>			
<div style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <p>Fill in the yellow shaded boxes; only those that apply. Input the Total of Annual Benefits into the Valuation sheet. Use the lowest box to include qualitative benefits.</p> </div>			
Potential Benefits	Benefit Calculation	Annual or One-Time Benefits (\$000)	
Increase in Power Train Efficiency	<small>example:</small> Annually = 2% * 100 aMW * 6 mths * 30 days * 24 hrs * 35 \$/MWh	\$302.40	
Change in Scheduled Project (Plant) Availability			
Avoidance of a Forced Outage at the Project			
Reduction in Annual Planned Maintenance Labor Costs			
Reduction in Annual Materials and Supplies Costs			
Other - Fill in: _____			
Total Quantifiable Benefits		\$302.40	
Qualitative Benefits: (fill in here) <div style="border: 1px solid black; height: 100px; width: 100%; margin-top: 5px;"></div>			



VALUATION TECHNIQUE

Project: **UNIT 5**

Resource File: **5**

Subproject File: _____

Discount Rate: **0.06%** Inflation: **2.2%**

Fixed Year: **2004** 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

Incremental Period: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Example:

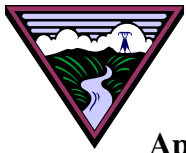
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Life Cycle Costs (see negative cost sheet)	251.4	(283.5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life Cycle Benefits (see positive cost sheet)	2022.4	352.4	318.8	315.2	312.1	308.7	305.2	301.7	298.2	294.7	291.2	287.7	284.2	280.7	277.2	273.7	270.2	266.7	263.2	259.7	256.2	252.7	249.2	245.7	242.2
Net Benefits	1771.0	668.9	318.8	315.2	312.1	308.7	305.2	301.7	298.2	294.7	291.2	287.7	284.2	280.7	277.2	273.7	270.2	266.7	263.2	259.7	256.2	252.7	249.2	245.7	242.2

Present Value of Net Benefits Formula

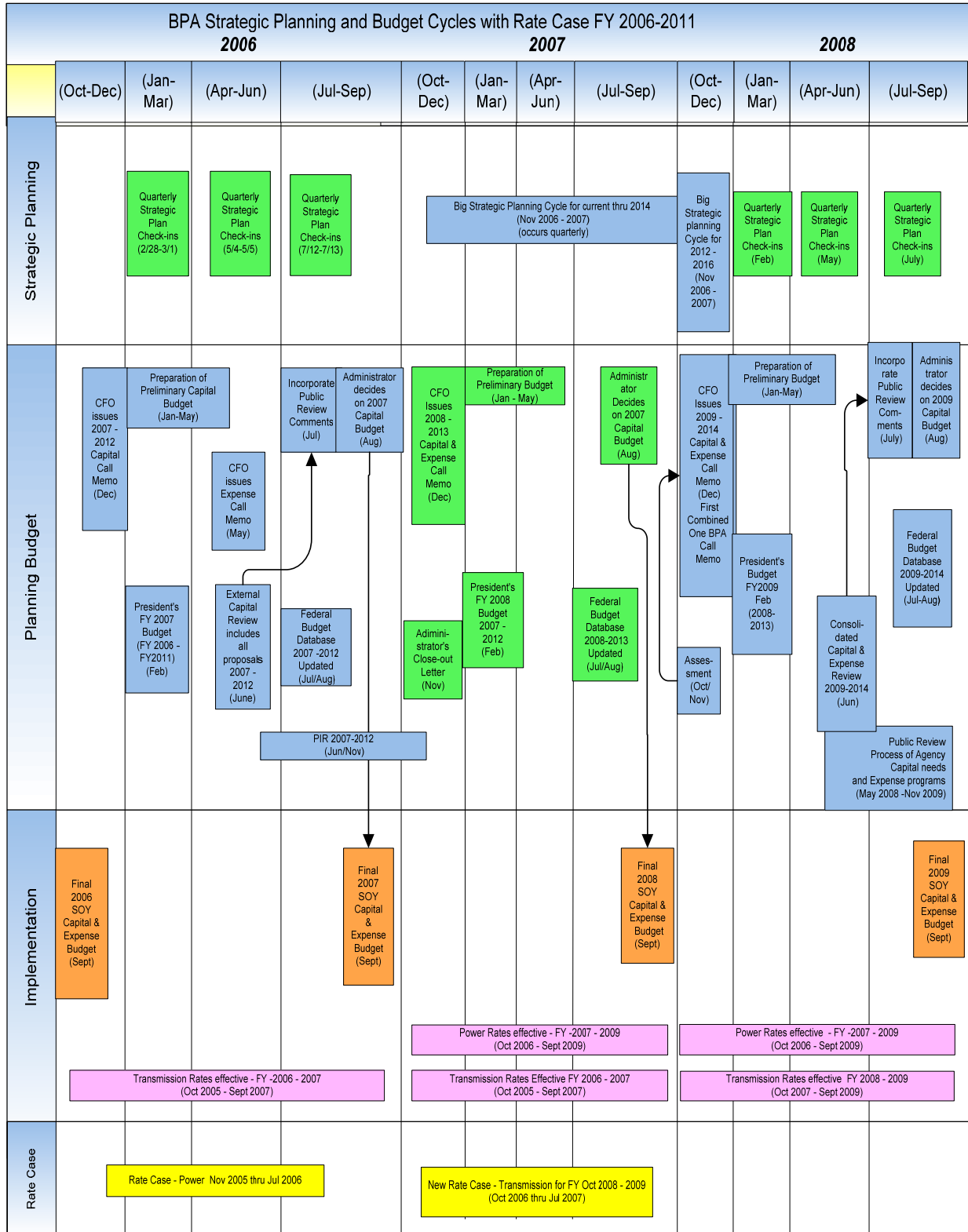
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Net Benefits	1771.0	668.9	318.8	315.2	312.1	308.7	305.2	301.7	298.2	294.7	291.2	287.7	284.2	280.7	277.2	273.7	270.2	266.7	263.2	259.7	256.2	252.7	249.2	245.7	242.2
Present Value Factor	0.943	0.887	0.831	0.775	0.719	0.663	0.607	0.551	0.495	0.439	0.383	0.327	0.271	0.215	0.159	0.103	0.047	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Present Value	1669.8	590.0	265.1	243.7	223.8	204.9	186.5	168.6	151.2	134.3	117.9	102.0	86.6	71.7	57.3	43.4	29.9	16.8	4.1	1.0	0.2	0.0	0.0	0.0	0.0

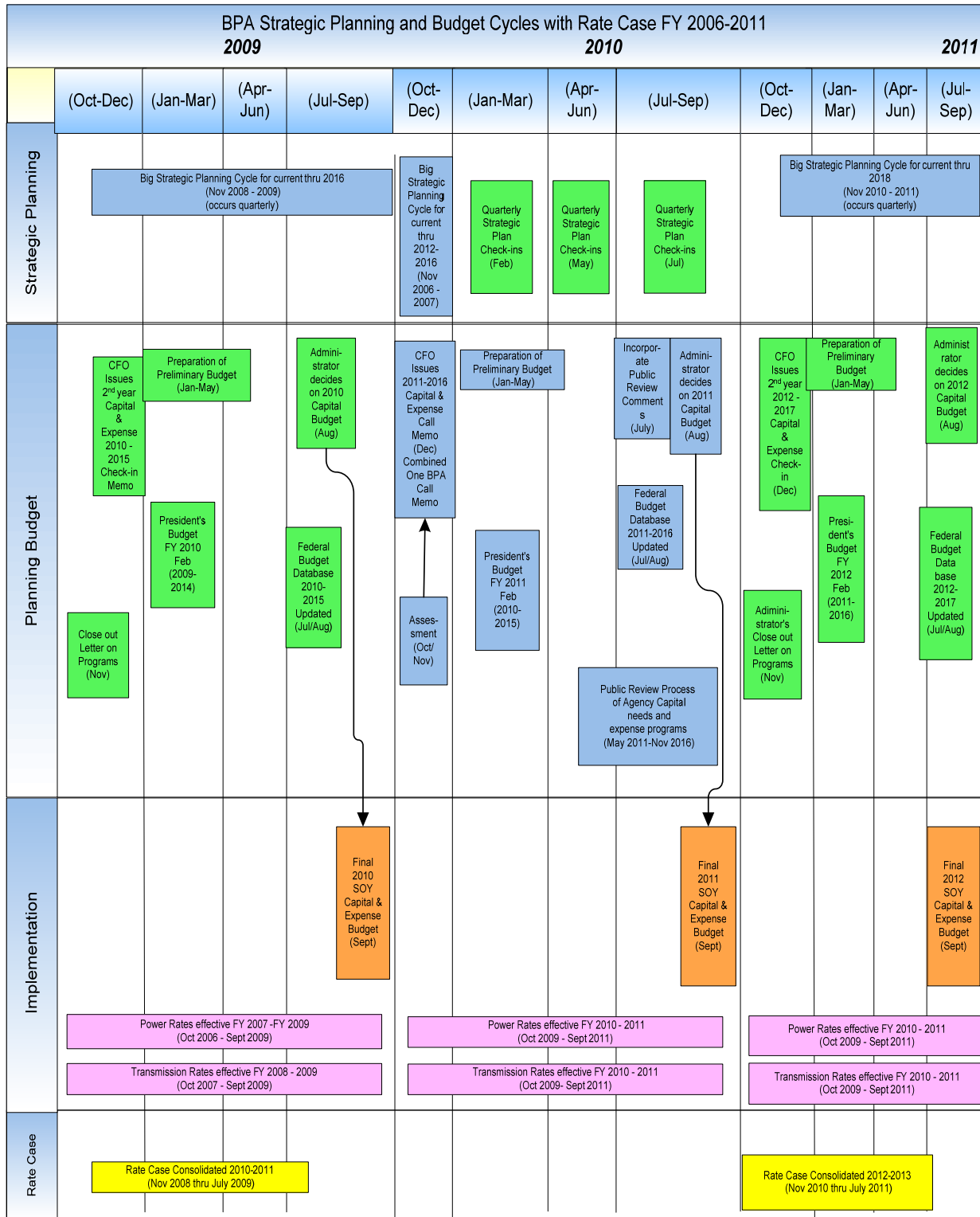
Internal Rate of Return: **58.54%**

Benefit Cost Ratio: **5.13**



Appendix - 2







Appendix – 3

Detailed Recommendations for Capital Allocation

Following the completion of the Gap Analysis, the team developed a set of recommendations for implementing integrated AM at BPA. As noted earlier, this integration would create a common centralized framework (and associated organizational processes) for prioritizing spending, strengthen the linkage between spending and strategic goals, capture both the life-cycle cost and the risks associated with an asset decision, and render the AM function transparent, easy to comprehend, and auditable.

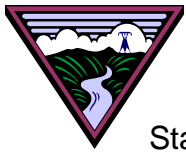
Asset Management Framework

To fulfill these requirements, an AM framework must explicitly (and simultaneously) address several factors that drive capital allocation decisions.

- It must consider the availability of potential funding for projects, accommodating the need for sustainable capital through 2018.
- It should optimize the mission-based objectives of the capital projects, minimizing project costs to the extent possible while achieving low rates, system reliability, environmental stewardship, and overall regional accountability.
- It must recognize and deal with the trade-offs among projects competing for the same funds.

In response to this challenge, the AM Team developed a common framework for capital allocation. This framework contains four major components:

1. Standardized decision packages: Such standardized packages ensure that the various asset areas within BPA report comparable information for each spending proposal.
2. Risk mapping: This tool would codify Agency-wide agreement on how to compare spending proposals within and across project categories or asset areas in terms of avoided risk and project risk.
3. An integrated calendar/schedule: This schedule would guide not only near-term implementation of the AM EPIP Team's recommendations but, on an ongoing basis in the longer term, integrate the capital allocation process with strategic planning, budgeting, and rate cycles.
4. A new organizational process and structure for allocating capital: The new process is built on the previous BOB decision to create the CAB. Structural roles and responsibilities are clarified.



Standardized Decision Packages: The decision package to be used for all capital projects would contain the following elements (and may possibly be supplemented by additional items if appropriate):

- A description of the capital project or portfolio,
- An explication of the key issues to be addressed in the assessment, including a summary overview, a specification of spending category for the project (replacement, cost reduction, expansion, safety, or environment), and a linkage to other projects or programs,
- A prioritization of the project relative to other assets as well as its linkage to long-term asset and financial plans (the latter beginning in the FY 2008 process),
- A description of the associated resource requirements, include capital and expense (full life cycle costs for the FY 2008 process), budget requests in the current cycle, Agency financial impacts, and other relevant project-specific considerations (e.g. funding provided by external parties, special staffing needs, etc.),
- An enumeration of project benefits, including its strategic benefits, economic benefits (e.g. Net Present Value, net benefits, cost/benefit ratio), and impact on performance metrics (e.g. KPI's, maintenance optimization),
- Graphical and written depictions of the life cycle timeline of costs and benefits (with milestones for the 2008 process), and
- An assessment of associated risks, including an identification of their type, likelihood, and consequence as well as a proposal for how these risks will be monitored and treated. The risk map associated with this task provides a direct linkage with the prioritization matrix used to compare the relative importance, costs, and benefits of the full set of the Agency's capital projects.

Risk Mapping: Risk mapping is the means by which BPA will consider risk incurred by undertaking capital projects and to understand the risk of not doing capital projects.

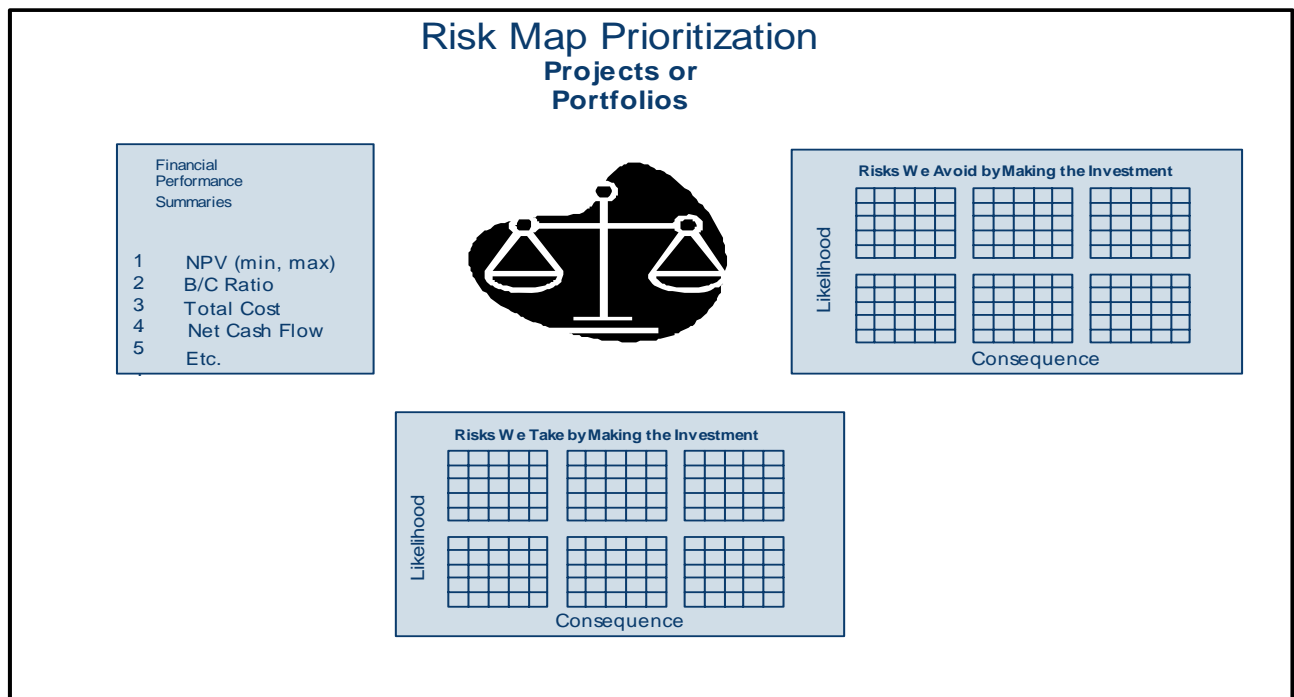
Identified with each capital project (or portfolio) is an assessment of risk in terms of the objectives served by the project. That understanding of risk also is expressed by the location of that project on one or more risk maps. A risk map is a 5-by-5 matrix that compares the likelihood and consequence of a risk and since risk is essentially a failure to achieve an objective, it is common to have multiple risk maps for different kinds of risk impacts (e.g. financial, reliability, environment, regional accountability).

- For each investment under consideration, the projects are evaluated using BPA's adopted risk management process. Full consideration of risk takes into account both the risks taken by making the investment and the risks avoided by making the investment. There is a set of risk maps associated with each of the types of risk (e.g. matrices for environment, reliability, financial, and regional accountability for risks taken and similar matrices for risks avoided).
- Each project or portfolio's risk will be identified by its position on the five by five grid for a particular type of risk consequence that shows the likelihood of the risk associated with that project. Consequences range from 1- insignificant to 5 –



- extreme. On a similar scale, likelihoods range from 1- rare to 5 – almost certain. Different levels of the likelihood and consequence scales are explicitly defined. Scales are designed to capture the range of potential consequences and permit discrimination among project (portfolio) risks compared on the risk maps.
- Risk is just one category of information provided by the Standardized Decision Package. As such, it is expected that risk maps will contribute to a broader understanding of project or portfolio trade-offs that address multiple decision attributes. The application of risk maps for this purpose is simply a convenient and efficient way of making risk information readily available and accessible to decision makers. The Figure Appendix 3.1 that follows illustrates in general form how this framework would be applied to specific projects or portfolios.

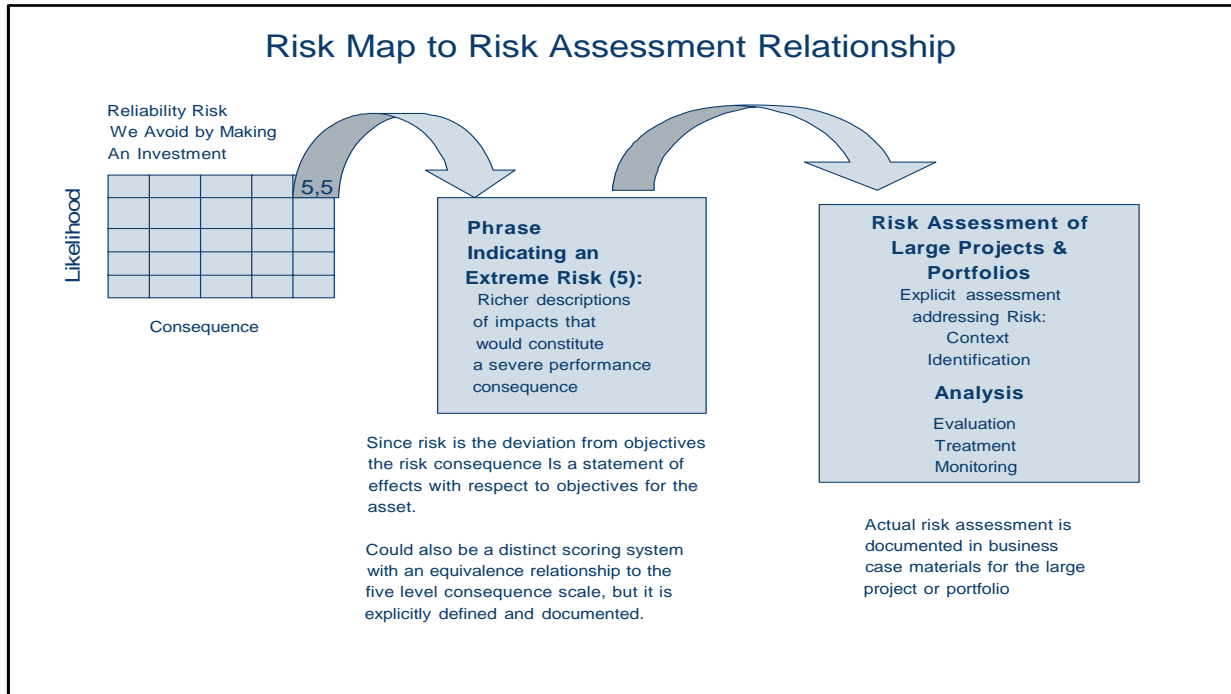
Figure Appendix 3.1



After project (or portfolio) risk maps have been prepared, they are placed side-by-side in the prioritization matrix and compared. Selection of projects to be financed will be made after screening them according to sequential decision criteria (e.g. financial performance summaries followed by avoided risks followed by comparison of the cost of the project levels against predetermined rate levels). The Figure Appendix 3.2 that follows graphically depicts the process of aggregation from project to Agency level.



Figure Appendix 3.2



Decision Making Process: The capital decisions would be made using a three step process. The process would begin by assessing the financial performance summaries. The projects would be ranked based on a predetermined level of financial performance. The projects would also be ranked based their positions on the risk maps considering the agency's tolerance for risk. The costs of all projects initially passing both the financial performance and risk hurdles would be compared to the amount that the agency believes it can afford by analyzing rate and sustainable capital effects. Final decisions would be made at the margin if either additional projects may be selected or must be eliminated. BPA managers involved in the decision making process would have the discretion to elevate or lower project rankings based on their knowledge and experience.

An example of how such sequential decisions are made is offered in the Figure Appendix 3.3 below.



Figure Appendix 3.3

Decision Methodology: An Example

- Step One: Financial Performance Summaries
 - Initially select all projects with net present value greater than zero and/or
 - Initially select all projects with benefit/cost ratio greater than one
- Step Two: Risks We Avoid by Making the Investment
 - Initially select all projects with likelihood and consequence scores of at least three for each element
- Step Three: Compare Dollar Amount of All Projects Initially Selected by function against predetermined level set by rate effect analysis
 - If projects initially selected do not exceed the predetermined level then decide either to possibly expand the amount of projects or approve projects initially selected
 - If projects initially selected exceed the predetermined level then decide to reduce the amount of projects at the margin by restricting the criteria used to initially select projects in either step one or step two

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Calendar/Schedule: The timetable for implementation of the AM EPIP Team's recommendations was developed and described according to each of the 5 criteria themes: governance, strategy and vision, operations, spending framework, and stakeholder. The next Figure Appendix 3.4 describes tasks that when followed will implement a "Best Practices" AM program at BPA.

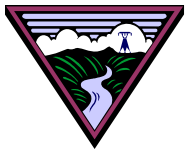
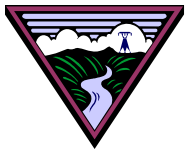


Figure Appendix 3.4 Asset Management Implementation Timeline

1/17/2006	BOB gives final Approval of AM EPIP Recommendations
2/1/2006	COO designates interim agency asset manager
2/28/2006	Interim agency asset manager creates PD for Agency Asset Manager and additional strategist PD
2/28/2006	Executives designate interim asset category asset managers after collaborating with COO on selections
3/31/2006	Interim Agency Asset Manager works with COO to establish draft Agency policy for AM including delegation of authority and submits to VP of Employee and Business Resources to run approval process
3/31/2006	Interim Agency Asset Manager prepares charter for AM Council in collaboration with other asset managers and CRO designee
3/31/2006	Agency AM Council is commissioned
4/30/2006	Interim Agency Asset Manager recommends to BOB the definition of the strategic physical assets for hydro and transmission
3/31/2006	Interim agency asset manager and COO fill both AM positions
3/31/2006	COO approves budget and FTE allocation for agency asset manager for remainder of FY 2006
3/31/2006	Incorporate AM responsibilities into individual performance contracts
3/31/2006	Hydro's Asset Manager completes two prototype asset plans for Black Canyon and Dworshak
4/30/2006	AM Policy approved for BPA Manual by internal review process
4/30/2006	AM Council recommends training to exploit the benefits of modern AM
4/30/2006	Asset categories submit capital planning estimates for FY's 2007 through 2012 to support upcoming stakeholder process
4/30/2006	Hydro's asset manager in collaboration with the Agency Asset Manager assesses prototype plans according to agency needs and decide how to move forward on additional prototype plans
5/15/2006	CFO completes rate and sustainable capital analysis completed for upcoming stakeholder review
6/30/2006	COO establishes the appropriate agency wide organization structure that facilitates implementing AM functions as part of agency reorganization effort in FY 2006
7/1/2006	Stakeholder review of capital programs complete
7/15/2006	Asset categories submit FY 2007 capital allocation requests
8/1/2006	Administrator decides 2007 allocation of capital and expense programs and for out year budgets for DOE budget submission
9/30/2006	Transmission and Hydro's asset managers establish an asset registry for the strategic assets to provide sufficient data for asset planning in 2007
9/30/2006	Hydro's asset manager completes 4 additional prototype asset plans for hydro
9/30/2006	Asset Managers put agency strategy and capital allocation software in place
9/30/2006	Transmission's Asset Manager completes 2 prototype plans for transmission.
10/30/2006	Agency Asset Manager recommends revisions to capital allocation methodology for use in budget process for FY 2008



- 11/30/2006 Internal Audit evaluation of Agency's AM effort
- 11/30/2006 CFO decides on requirements for standardizing financial analysis across asset categories
- 12/15/2006 CFO issues call the FY 2008 capital and expense process; process explicitly includes Emergency preparedness and scenario analysis in budget preparation
- 2/28/2007 Administrator creates a new Agency Strategic Plan that identifies and assesses asset risk tolerance from an Agency perspective**
- 4/31/2007 Strategic planning group develops long term BPA strategic objectives including performance expectations and agency asset targets (Level pbview input)
- 6/30/2007 Organizations submit FY 2008 capital and expense requests
- 7/31/2007 Asset Managers complete AM strategies for all asset categories relying on new Agency Strategic Plan**
- 8/1/2006 Administrator decides 2008 allocation of capital and expense programs and for out year budgets for DOE budget submission
- 9/30/2007 Agency Asset Manager finalizes the Agency Asset Strategy based on the individual asset category strategies**
- 9/30/2007 Strategic Planning group incorporates Agency strategy into the agency-balanced scorecard with line-of-sight supporting objectives at all levels of agency for use in FY 2008**
- 9/30/2007 AM Council will recommend the COO draft asset specific performance and condition targets that meet agency level one targets.
- 10/30/2007 Agency Asset Manager recommends revisions to capital allocation methodology for use in budget process for FY 2009
- 12/15/2007 CFO issues call memo for start the FY 2009 capital and expense process
- 4/15/2008 Asset managers complete all asset plans for all asset categories**
- 4/30/2008 Asset categories submit planning estimates for capital and expense for FY's 2009 through 2014 to support upcoming stakeholder process
- 5/15/2008 CFO completes rate and sustainable capital analysis for upcoming stakeholder review
- 7/1/2008 Stakeholder review of capital and expense programs complete
- 7/15/2008 Organizations submit FY 2009 capital and expense requests
- 8/1/2008 Administrator decides 2009 allocation of capital and expense programs and for out year budgets for DOE budget submission
- 9/30/2008 Final performance and condition targets that cascade from level on pbview targets through asset specific asset targets will exist
- 9/30/2008 Agency's Asset Manager completes implementation review that enable complete implementation of asset plans effective October 1, 2008**
- 10/30/2008 Agency Asset Manager recommends revisions to capital allocation methodology for use in budget process for FY 2010
- 12/15/2008 CFO issues call memo for the FY 2010 capital and expense process



Organizational Process and Structure

As described in the discussion of the implementation schedule above Figure Appendix 3.5, the AM Team proposed a series of new organizational roles and responsibilities to ensure and optimum allocation of capital and the integration of AM at the Agency level.

Under the proposed organization, the BOB is responsible for oversight of both the AM planning and budgeting structure and asset performance. The BLs prepare budget proposals and decision packages, consult with other Agency units affected by budget proposals, and challenge their own budget proposals for cost-effectiveness and linkage to asset and strategic plans.

Strategic Planning is responsible for developing decision package templates and guidance and collaborating with BLs on decision package preparation. After budget approval, Strategic Planning prepares descriptions of how budget decisions advance Agency and asset strategies. On an ongoing basis, this group tracks strategic performance against budget.

Strategic Planning is the assumed organization for the new agency AM function. The agency AM Function would ensure that the AM plans and capital investments reflect the agency's strategic direction, annually review the criteria used for prioritizing capital investments, and propose any changes that are needed to keep the capital prioritization process in alignment with best practices and agency strategy.

The Agency CFO has a number of key AM responsibilities, some of which are carried over from current practice, some of which are new. The CFO is responsible for developing pro formas, recording budget decisions, consolidating decisions into the Agency budget, communicating outcomes, and tracking financial performance against the budget. Additionally, the CFO fulfills an important new role as the chair of the CAB.



Figure Appendix 3.5

Structural Roles and Responsibilities

- **BOB**
 - Oversight of the planning and budgeting structure
 - Performance oversight
- **Capital Allocation Board**
 - Chair: CFO
 - Prepare “call letter”
 - Approve decision package templates
 - Review budget decision packages submitted by the business lines
 - Make capital allocation recommendations to the Administrator
 - Identify issues requiring BOB attention
- **Business Lines**
 - Prepare BL budget proposals and decision packages
 - Consult with other Agency units affected by budget proposals
 - Challenge their own budget proposals for cost-effectiveness and linkage to asset and strategic plans.
- **Strategic Planning**
 - Staff the Capital Allocation Board
 - Develop decision package templates and guidance
 - Collaborate with business lines on decision package preparation
 - After budget approval, prepare description of how budget decisions advance Agency and asset strategies
 - Track strategic performance against budget
- **CFO**
 - Develop pro forma’s
 - Record budget decisions
 - Consolidate decisions into Agency budget
 - Communicate outcomes
 - Track financial performance against budget
- **CRO**
 - Develop Agency ERM policies and procedures for ERMC consideration.
 - Deploy an Agency-wide ERM framework, program and infrastructure.
 - Ensure the development of risk measurement and valuation methodologies.
 - Ensure that BPA’s ERM process is being consistently applies throughout the Agency.
 - Provide leadership for the implementation and sustainability of the ERM process.
(From the BPA Internal Management Plan for Implementing an Enterprise Risk Management Program)
- **ERMC**
 - Ensure the development and communication of an ERM program
 - Ensure that enterprise risks are systematically and effectively addressed by accountable organizations
 - Recommending enterprise risk management policies and procedures to the Administrator.
 - Proposing broad risk limits for major areas of BPA’s risks.



The CAB includes representatives that have responsibility for all the asset areas at BPA. In addition to the CFO, it is composed of:

- Senior Vice President of Power Business Line (voting)
- Senior Vice President of Transmission Business Line (voting)
- Chief Information Officer (voting)
- Chief Risk Officer (voting)
- Vice President of Strategic Planning (voting)
- Agency Budget Officer – KFF (nonvoting)
- Technical, programmatic advisors (4) – Power, Transmission, IT and Finance Function (nonvoting)³
- Note Taker – For Standards of Conduct purposes (nonvoting)

Broadly stated, the mission of the CAB is to provide an Agency-wide perspective on capital investments and assist the Agency in providing more transparency for customers and constituents. It is tasked with developing a proposal for capital spending that provides the highest value for the Agency. More specifically, the CAB

- prepares the call letter,
- approves decision package templates,
- reviews budget decision packages submitted by the BLs
- makes capital allocation recommendations to the Front Office,
- identifies issues requiring BOB attention,
- ratifies the methodology for capital spending decisions,
- identifies risk factors to be evaluated,
- assigns the coordination of the development of the scales for the risk evaluations,
- creates clarity on the process for the risk evaluations,
- assigns the review of risk evaluations for cross-agency consistency,
- establishes financial decision criteria,
- agrees upon critical thresholds for decisions based on performance matrix evaluations, and
- decides the level of external transparency for the AM process.

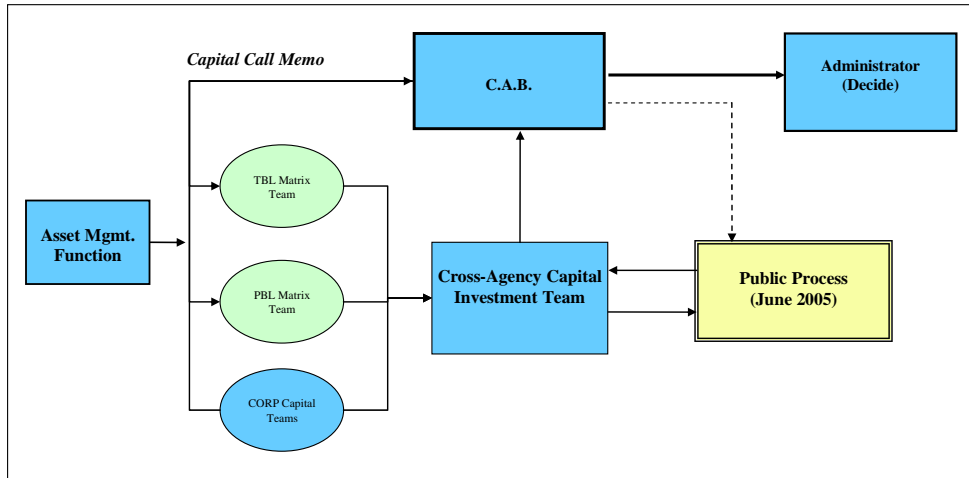
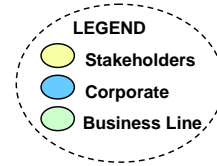
One of the first tasks for the CAB is codify a charter outlining the business operations of the board. It is important to note that the Senior Vice Presidents of Transmission and Power are not Senior Officers as defined by the FERC. Under the FERC's SOC, they can not influence the amount of investment in each other's organization nor can the Senior Vice President of Power receive transmission investment information before that information is made public. There are several approaches that can be deployed for mitigating real, potential, or perceived violations of these restrictions. BPA's SOC Officer should review the Board's charter for compliance with the standards.

The following Figure Appendix 3.6 diagram situates the CAB's within the Agency AM structure.



Figure Appendix 3.6

Capital Allocation Decision Process



Bonneville Power Administration

