Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

PUBLIC AFFAIRS

October 6, 2011

In reply refer to: DK-7

Richard van Dijk
Ex 6

FOIA #BPA-2011-01732-F

Dear Mr. van Dijk:

This is a final response to your request for records that you made to the Bonneville Power Administration (BPA) under the Freedom of Information Act (FOIA), 5 U.S.C. 552.

You have requested the following:
Copies of the financial rules, regulations and procedures that need to be complied with when justifying new capital transmission projects that would use the embedded transmission rate structure.

Response:
BPA has provided the responsive documents in their entirety. Two of the documents are chapters from the BPA Manual. We have also included a sample business case form as well as a sample business case that was used at BPA.

Pursuant to 10 CFR 1004.8, if you are dissatisfied with this determination, or the adequacy of the search, you may appeal in writing within 30 calendar days of receipt of a final response letter. The appeal should be made to the Director, Office of Hearings and Appeals, HG-1, Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA Appeal is being made.

I appreciate the opportunity to assist you. Please contact Cheri Benson, FOIA/Privacy Act Specialist at (503) 230-7305 with any questions about this letter.

Sincerely,
/S/Christina J. Munro
Christina J. Munro
Freedom of Information Act/Privacy Act Officer

Enclosure: responsive documents

CAPITAL PROJECT PROPOSAL
- *Business Case* -

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PROJECT IDENTIFICATION		
01	Project Number:	
02	Name of Project:	
03	Asset Category:	<<Select from drop down choices>
04	Portfolio:	<Select from drop down choices>
05	Sub-Portfolio:	
06	Discretionary or Non-Discretionary Project?	<Select from drop down choices>
06A	*If Non-Discretionary, please provide explanation:*	
07	Approval for:	<Select from drop down choices>
08	Investment Type:	<Select from drop down choices>
09	Emergency?	☐ **YES** ☐ **NO**
09A	*If "YES", please provide explanation:*	

KEY PROJECT DATES		
10	Business Case Submission Date ***or*** Revision Date:	
11	Planned Start Date:	
12	Note Regarding Planned Start Date:	<Select from drop down choices>
12A	*If "Other", please provide explanation:*	
13	Planned Completion Date:	

PROJECT INVESTMENT SUMMARY TABLE — HELP

The box below is where you will paste in the "Project Investment Summary" table from Excel [refer to Help instructions above]

CAPITAL PROJECT PROPOSAL
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PROJECT SPECIFICS			
14	In Start of Year Budget?	☐ YES	☐ NO
14A	*If "**YES**", please provide the following:*	**Dollar Amount:** $	
		In-Service Date:	
15	In Asset Plan?	☐ YES	☐ NO
15A	*If "**YES**", please provide the following:*	**Dollar Amount:** $	
		In-Service Date:	
16	Has this Asset been designated "***critical***" in the business unit asset strategy?	☐ YES	☐ NO
17	Is this a stage-gate project?	☐ YES	☐ NO
17A	*If "**YES**", please provide explanation:*		
18	Other requirements/approvals needed for project?	☐ YES	☐ NO
18A	*If "**YES**", please provide explanation:*		

BUSINESS CASE SYNOPSIS		HELP
19	*This section is an overview of the project proposal. It should be completed after all the other sections in the Business Case have been completed*	

APPROVALS		HELP
20	*Please note that **ALL FIELDS** must be completed below!*	

Asset Accounting Capitalization Review:	**Date Approved:**
This form is completed by:	**Date Submitted:**
Name of Project Sponsor / Title:	**Date Approved:**
Project Sponsor *Title*	
Asset Category Approval / Title:	**Date Approved:**
Approval *Title*	

NARRATIVE		
21	**Project Context/Background:**	HELP
22	**Investment Objectives:**	HELP

A. **PRIMARY Long-Term Outcome:**

B. **SECONDARY Long-Term Outcome:**

C. **Please describe investment objectives below**:

23	**Key Decision Criteria:** (Type up to a maximum of **FIVE (5) entries** for each category)	HELP

Business/Finance:

- ►
- ►
- ►
- ►
- ►

Legal/Regulatory:

- ►
- ►
- ►
- ►
- ►

Environmental:

- ►
- ►
- ►
- ►
- ►

Public Interest:

- ►
- ►
- ►
- ►
- ►

BPA's People and Processes:

- ►

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NARRATIVE

- ►
- ►
- ►
- ►

Other Factors:

- ►
- ►
- ►
- ►
- ►

24	**Describe the proposed investment and the alternatives considered:**	HELP

Proposed Investment:

Next best alternative:

Status Quo:

25	**Risks Addressed by this Project:**	HELP

26	**Financial Analysis:**	HELP

Describe the assumptions for capital costs:

Describe the assumptions for non-recurring project expense(s):

Describe the assumptions for incremental benefits:

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NARRATIVE		
Describe the assumptions for incremental costs:		
NPV of the recommended alternative:	**$**	
NPV of the next best alternative:	**$**	
Please discuss the NPV results:		
Discuss the Sensitivity Analysis and Results:		
27	**Project execution risks and management controls:**	**HELP**
28	**Recommended Targets & Thresholds for PBVIEWS:**	**HELP**

Measure Description: **PROGRAM COST**

Progress Indicators (PI):	**GREEN:**
	YELLOW:
	RED:
End of Project Target:	**GREEN:**
	RED:

Measure Owner:
Point of Contact:
Subject Matter Expert:
PBVIEWS Entry:

Measure Description: **PROJECT SCHEDULE**

Progress Indicators (PI):	**GREEN:**
	YELLOW:
	RED:

CAPITAL PROJECT PROPOSAL
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NARRATIVE	
End of Project Target:	**GREEN:**
	RED:
Measure Owner:	
Point of Contact:	
Subject Matter Expert:	
PBVIEWS Entry:	
Measure Description:	**PROJECT / PROGRAM SCOPE OR CAPABILITY**
Progress Indicators (PI):	**GREEN:**
	YELLOW:
	RED:
End of Project Target:	**GREEN:**
	RED:
Measure Owner:	
Point of Contact:	
Subject Matter Expert:	
PBVIEWS Entry:	
Measure Description:	**OTHER PERFORMANCE MEASURE(S)**
Progress Indicators (PI):	**GREEN:**
	YELLOW:
	RED:
End of Project Target:	**GREEN:**
	RED:
Measure Owner:	
Point of Contact:	
Subject Matter Expert:	
PBVIEWS Entry:	

29	**What are the appropriate metrics to judge the success of the investment once it is placed in service?**	**HELP**

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Financial Model and Other Information	HELP

Double click on icon below to open up the EXCEL MODEL workbook:

Financial Model

CAPITAL PROJECT PROPOSAL
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HELP SECTION ON SPECIFIC QUESTIONS	
SECTION C: **PROJECT INVESTMENT SUMMARY TABLE**	The Project Summary Investment table from the embedded Excel financial model must be copied and pasted into the box provided. The Excel model is embedded in the template in the final section (Financial Model and Other Information): From the "Summary" worksheet of the Excel model, highlight the complete table and click on the "Copy" icon. Switch to the Word template, place your cursor inside the box provided and select Edit, Paste Special, and then choose Picture (Enhanced Metafile). You will need to replace the summary table if the numbers in the Excel model change, so this step is better left until the business case is nearly complete.
Question #19 **BUSINESS CASE SYNOPSIS**	The business case synopsis should be completed only after the rest of the business case is complete. The synopsis should be brief, but should capture key points from each section of the business case. The synopsis discussion should be organized to follow the order of the template – background, objectives, etc. No new information should be included in the synopsis. If you cut and paste from the rest of the template, be careful to be brief and to focus on just the key points.
Question #20 **APPROVALS**	All approvals must be complete before the business case is submitted for agency approval. The Asset Accounting review requires that you consult with Asset Accounting to obtain the approval signature. The purpose of the Asset Accounting review is to verify that the project costs are properly classified as either expense or capital. The signature should be from the Asset Accounting representative who performed the review. You should obtain and retain an e-mail or other document from the Asset Accounting representative to support their approval. The final approval (Asset Category Approval) should generally be a vice president. In addition to filling out their name and date on this electronic form, some form of supporting documentation for the approval must be sent to Agency Asset Management. That documentation can be an e-mail from the approver indicating approval, a hard copy signature, PDF signature, or equivalent.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #21 **NARRATIVE** **Project Context/Background**	In general, this section is the problem statement. You should describe the current state and explain how we arrived at the current state. What has (or hasn't) occurred that now requires this investment? This section should include (where appropriate): A description of the facility/equipment/asset that is to be replaced, expanded, reinforced or upgraded. Include location, capability, purpose, etc. The condition of the equipment, including supporting inspection and maintenance information. The requirements or standards that are not being met (or will not be met) by the current equipment.
Question #22 **NARRATIVE** **Investment Objectives**	In this section, you will describe the objectives of the investment. Select the general objectives from the supplied options for A and B. Then describe the specific objectives in section C. Your explanation should: Describe the desired future state – what does this investment need to accomplish? This is not a description of the project; it is a description of the outcome you are trying to achieve. Be specific – comply with NERC standard X, increase capacity by X, improve response time to X, reduce outages by X, serve new customer X, etc.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #23 **NARRATIVE** **Key Decision Criteria**	The key decision criteria are the factors you will use to evaluate the alternatives to meeting your investment's objectives. Here you are identifying which factors will be important to you as you evaluate your alternatives to choose the best solution. You may be unable to identify criteria in each of the categories. The following are some examples: **Business/Finance:** • The solution must be least life cycle cost. • Reliability must increase by at least X. • The solution must be accommodated within the FY XXXX budget. • Capability must increase by at least X. • The rate impact must be less than X. **Legal:** • Contract provision X must be met. • At minimum, the solution must comply with regulation X. **Environmental:** • The solution must produce a minimum flow of X. • The solution should reduce energy consumption. • The solution should have no carbon footprint. • The solution must be consistent with renewable resource goals. **Public Interest:** • The solution must accommodate public input. • The solution must support regional goals for X. **BPA's People and Processes:** • The solution must add no workforce. • The solution must be consistent with BPAM X. • The solution must have executive support. • Implementation must be accomplished with existing workforce.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #24 **NARRATIVE** **Proposed Investment**	Describe the proposed investment or recommended alternative. Be specific: • What is being purchased, constructed or implemented? • Where will the work be performed? • When will the work be completed? • What resources are required to complete the project? • How will the project be conducted? • Explain why the proposed investment meets the key decision criteria better than the other options considered. **Next Best Alternative:** Describe the next best alternative – what would you do if you didn't make the proposed investment? Explain why the next best alternative is not as attractive as the recommended alternative. If any other alternatives were considered, briefly discuss them and why they were rejected. **Status Quo:** Describe the status quo if it was not described as one of the alternatives. The status quo is "business as usual" and isn't necessarily a "do nothing" case. It describes what you will do to get by, or continue to get by, instead of pursuing one of the alternatives.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #25 **NARRATIVE** **Risks Addressed by this Project**	**1. Provide Agency risk management context:** a. Define relationship of project to applicable **Agency** Top Enterprise Risks. b. Define relationship of project to applicable **Agency** strategic objectives. **2. Outline the risks to the Agency if this investment does *not* occur:** **a.** Provide a concise risk statement for each risk identified. **i.** Example: "Risk that *(description of event)* leads to *(description of outcome expressed in terms of impact on the Agency objectives)*" b. For each risk statement, quantify the level of risk in terms of Likelihood (probability of event occurring) and Consequence (impact on the organization). Do not use arbitrary or undefined ratings. Refer to the pre-defined Agency scales if necessary.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #26 NARRATIVE [Financial Analysis]	Respond to each of the prompts concerning the financial analysis contained in the embedded financial analysis model. When describing assumptions: Explain how you estimated your capital costs and non-recurring project expenses. What contingency is included in the estimates? Describe the incremental costs and benefits. This information should provide a general understanding of the costs and benefits that are included in the financial analysis model. In the financial analysis model, you will be required to detail the calculation of those costs and benefits. When discussing the NPV results, you may need to explain why the project NPV is negative, or why the recommended alternative may have a less attractive NPV than the next best alternative. A sensitivity analysis is required for projects over $7 million which have key cost/benefit drivers that are highly uncertain. The sensitivity analysis should include a range of assumptions to address the risk around the delivery of the expected value of the project, as measured by NPV or NCR. This should be done for all alternatives, including the status quo. The results should show the NPV of each alternative at the various sensitivity levels. You may use this analysis to support the cost threshold that you will propose in Section 28. Before proceeding with this analysis, consult the ACPRT or your finance subject matter expert to discuss the best approach for this analysis.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #27 **NARRATIVE** **Project Execution Risks and Management Controls**	**1. Describe the Project Execution risks related to this project:** **a.** Provide a concise risk statement for each project execution risk that may impact project performance, cost, and schedule milestones (Example: "Risk that *(description of event)* leads to *(description of outcome expressed in terms of impact on the project objectives or deliverables).*" b. For each risk statement, quantify the level of risk in terms of Likelihood (probability of event occurring) and Consequence (impact on the organization). Do not use arbitrary or undefined ratings. Refer to the pre-defined Agency scales if necessary. Avoid boilerplate language (e.g. "risk that schedule overruns results in project delays"); each risk should be supported by specific and verifiable supporting information. c. For each risk, outline the details of your treatment plan that will reduce the level of risk. The level of information here should follow S.M.A.R.T. principles; information provided should be Specific, Measurable, Actionable, Relevant, and Time-oriented. d. If management is willing to accept all (or a portion of) the risks identified, supporting rationale should be provided.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #28 NARRATIVE [Recommended Targets & Thresholds for PBVIEWS:]	In this section, you will propose targets and thresholds for cost, schedule and scope. There is a fourth field available (Other Performance Measure) for an additional target, if appropriate. The targets should be focused on the project-end state: total direct capital costs, final in-service date and complete delivered scope. The thresholds you propose, above the direct capital costs and expected in-service date in your business case, should be based on some level of thought or analysis regarding the uncertainty in your project. What, in particular, is uncertain and what does that mean for cost, schedule and scope? The following example is a typical set of targets for cost, schedule and scope. There are many actual examples available on the Agency Asset Management SharePoint site. You can access those by browsing the approved projects folders and looking at the ACPRT or CAB decision documents. ***PROJECT COSTS:*** Program Indicators: Green: Total direct capital cost is forecast to be $8.0 million or less. Yellow: Total direct capital cost is forecast to be between $8.0 million and $8.9 million. Red: Total direct capital cost is forecast to be greater than $8.9 million. End of Project Target: Green: Total direct capital cost is $8.9 million or less. Red: Total direct capital cost is greater than $8.9 million. ***PROJECT SCHEDULE:*** Project Indicators: Green: Project is forecast to be placed in service by 6/30/2014. Yellow: Project is forecast to be placed in service between 6/30/2014 and 8/31/2014. Red: Project is forecast to be placed in service after 8/31/2014. End of Project Target: Green: Project is placed in service by 8/31/2014. Red: Project is placed in service after 8/31/2014. ***PROJECT/PROGRAM SCOPE OR CAPABILITY:*** Program Indicators: Green: Component replacements are forecast to be completed at all of the 20 sites identified. Yellow: Component replacements are forecast to be completed at between 19 and 20 sites. Red: Component replacements are forecast to be completed at less than 19 sites. End of Project Target: Green: Component replacements are completed for at least 19 of the sites identified. Red: Component replacements are completed for less than 19 of the sites identified.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #29 NARRATIVE **What are the appropriate metrics to judge the success of the investment once it is placed in service?**	Describe the metrics that you would use to measure the project's success, once it has been implemented. These metrics should be specific and measurable, wherever possible. Provide the baseline (pre-implementation) measurement for those metrics and the expected performance for those metrics following project implementation. Examples of metrics would include: capacity is X and is expected to be Y, response time is X and is targeted to be Y, outage minutes are X and will improve to Y, customer satisfaction levels are X and are expected to move to Y, etc. You may have already touched on these metrics in the objectives discussion in section 22. It's possible that the metrics are not clearly identified at this point in the project's development. In those cases, provide a commitment as to when the project metrics and current baseline measurements will be provided to the ACPRT.
Financial Model and Other Information	The Excel model that supports the business case must always be saved in the dedicated spot that it occupied when the template was delivered to you. The remaining area in this section may be used to attach additional information that supports the business case: • Limit attachments to information that is clearly relevant to the business case: maps, project timelines, cost detail, etc. • Relevant and focused excerpts from documents are more useful than entire documents. • You may also note and describe a document that is available, but not attached if the information in that document has a more general relation to the project, but not being specifically referenced. • If you attach entire documents select Insert/Object/Create from File and check the "Display as Icon" box. You may rename your attached file to a more meaningful name by clicking on the "Change Icon" button.

CAPITAL PROJECT PROPOSAL
- *Business Case* -

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PROJECT IDENTIFICATION		
01	Project Number:	EX0001
02	Name of Project:	IT Server Infrastructure Modernization
03	Asset Category:	Information Technology [IT]
04	Portfolio:	[IT] Information Technology
05	Sub-Portfolio:	IT Infrastructure Projects
06	Discretionary or Non-Discretionary Project?	Discretionary
06A	*If Non-Discretionary, please provide explanation:*	
07	Approval for:	New Start
08	Investment Type:	Capital Replacement
09	Emergency?	☐ **YES** ☒ **NO**
09A	*If "YES", please provide explanation:*	

KEY PROJECT DATES		
10	Business Case Submission Date ***or*** Revision Date:	9/12/2009
11	Planned Start Date:	11/1/2009
12	Note Regarding Planned Start Date:	The date the contract is awarded
12A	*If "Other", please provide explanation:*	
13	Planned Completion Date:	3/31/2013

PROJECT INVESTMENT SUMMARY TABLE

HELP

The box below is where you will paste in the "Project Investment Summary" table from Excel [refer to Help instructions above]

Dollars in Thousands	Prior Years	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Future Years	Total Project
Capital Investment								
Direct Costs	-	(1,500)	(4,491)	(5,310)	(1,488)	-	-	(12,789)
Overheads	-	-	-	-	-	-	-	-
AFUDC	-	(38)	(193)	(452)	(238)	-	-	(921)
Total Capital	-	(1,538)	(4,683)	(5,762)	(1,726)	-	-	(13,710)
Project Expense	-	(50)	(204)	(521)	(213)	-	-	(987)
Total Project Costs	-	(1,588)	(4,887)	(6,283)	(1,939)	-	-	(14,697)

Recommended Alternative	
NPV in 2010 Dollars	(7,791)
Discount rate sensitivity	NA
Net benefit to cost ratio	(0.56)
Economic benefit/cost	0.45
Discount rate - standard	10.5%
Discount rate - sensitivity	NA

Next Best Alternative	
NPV in 2010 Dollars	(9,672)
Net benefit to cost ratio	(0.86)
Economic benefit/cost	0.16

CAPITAL PROJECT PROPOSAL
- *Business Case* -

PROJECT SPECIFICS			
14	In Start of Year Budget?	☒ YES	☐ NO
14A	*If "**YES**", please provide the following:*	**Dollar Amount:**	**$ 2.1 Million for FY10**
		In-Service Date:	N/A
15	In Asset Plan?	☒ YES	☐ NO
15A	*If "**YES**", please provide the following:*	**Dollar Amount:**	**$ 13.3 Million**
		In-Service Date:	3/31/2013
16	Has this Asset been designated "***critical***" in the business unit asset strategy?	☒ YES	☐ NO
17	Is this a stage-gate project?	☐ YES	☒ NO
17A	*If "**YES**", please provide explanation:*		
18	Other requirements/approvals needed for project?	☒ YES	☐ NO
18A	*If "**YES**", please provide explanation:*	**APSC in addition to ACPRT/CAB**	

BUSINESS CASE SYNOPSIS	HELP
19	*This section is an overview of the project proposal. It should be completed after all the other sections in the Business Case have been completed*

This project will modernize the IT server infrastructure at the Headquarters, Ross and Munro data centers. The server hardware will be migrated to a modern, compact and efficient server/chassis installation. The new hardware will be accompanied by software and tools that provide system monitoring and otherwise enhance server operations and administration.

The objectives of the project are to increase efficiency and reliability, as well as to reduce the number of servers by 25% and reduce the corresponding cost of operations. In arriving at a solution, the project team considered a scaled down version of the project, as well as simply continuing with business as usual. The more robust solution recommended best meets the key decision criteria, which include least life-cycle costs, licensing compliance, and the desire for a "greener" data center. Additionally, the project addresses the current risks of uncontrolled infrastructure growth and cost escalation.

The financial analysis shows that the recommended alternative is clearly less costly than the scaled down next best alternative, while both alternatives are less costly than the status quo. This project is not an incremental investment, rather it is new way of managing investment in the server infrastructure. Rather than continue with in-kind replacements, this project redirects the investment into modern hardware and system tools.

During implementation, the project will face a number of risks including insufficient resources and a challenging transition to the new environment These risks are well mitigated in the project plan. Targets have been established for project implementation cost, schedule and scope. A series of metrics and baseline measurements have been established to allow a clear determination of whether the project delivers the intended improvements and benefits, once it is complete.

CAPITAL PROJECT PROPOSAL
- *Business Case* -

APPROVALS		HELP
20	*Please note that **ALL FIELDS** must be completed below!*	
Asset Accounting Capitalization Review:		**Date Approved:**
Joe Asset		8/31/2009
This form is completed by:		**Date Submitted:**
Jill Project		9/12/2009
Name of Project Sponsor / Title:		**Date Approved:**
John Manager	**IT Infrastructure Manager**	9/5/2009
Project Sponsor	*Title*	
Asset Category Approval / Title:		**Date Approved:**
Jim Officer	**Chief Information Officer**	9/6/2009
Approval	*Title*	

NARRATIVE

21 Project Context/Background: HELP

In recent years, the agency's IT server infrastructure has come under increasing pressure as demands for new services have increase, the efficiency and adequacy of current tools has eroded and costs have escalated. In 2005, the IT EPIP identified the need to improve the way the agency delivers computer applications. Prior to the EPIP, the agency had an installed server base of 1,047 units. Through the EPIP process, the number of servers has been reduced to around 960 units today (while accommodating increased requirements).

Although the EPIP brought a number of improvements, significant challenges remain. There is still limited knowledge of the installed server inventory and the dependencies between servers. Without an accurate inventory, the agency is at risk of licensing violations. If the dependencies aren't understood, outage restoration and configuration changes are far more difficult. System performance monitoring also remains fairly limited. Robust performance data is key to maximizing system utilization and efficiently directing infrastructure investment. In the absence of comprehensive performance data, the agency has relied on ad hoc and reactive responses in addressing new requirements and performance issues.

This project will be focused on the system hardware (primarily servers), software, tools and vendor support for the data centers at Headquarters, Ross and Munro. Given that the hardware is on a normal replacement cycle, the condition of the servers is reasonably good. This project will redirect that replacement cycle to change out the servers to high-efficiency/small-footprint units over a reasonable period. In that process, the existing hardware will generally be used to the end of its normal life cycle. Coupled with the hardware replacements will be the installation of system monitoring software, redesign of supporting processes and re-alignment of policies and procedures to support the new environment.

In total, the changes will allow the agency to efficiently meet new application requirements, reduce system downtime (and downtime risk) and provide users with a higher performance server infrastructure.

22 Investment Objectives: HELP

A. **PRIMARY Long-Term Outcome:**
(IT) Reliability and availability standards

B. **SECONDARY Long-Term Outcome:**
(IT) Agency business requirements

C. **Please describe investment objectives below**:

The objectives of the project are to leverage current technology to:
- Increase the efficiency of application delivery as measured by Microsoft Operations Framework (MOF) maturity ratings.
- Improve reliability by reducing unplanned outages by 40%.
- Reduce the life cycle costs of IT systems by 15% per installed server.
- Reduce the number of servers to 720 units or less.
- Deliver "greener" data centers through reduced data center power consumptions (35% decrease) and more efficient space utilization.

NARRATIVE

A more detailed description of the desired performance improvements and the metrics that will be used to measure their delivery is included in Section 29 of the business case.

23	**Key Decision Criteria:** (Type up to a maximum of **FIVE (5) entries** for each category)	HELP

Business/Finance:

- The selected alternative results in least life cycle costs for the server infrastructure.
- The selected alternative produces a reduction in the number of installed servers.
- Some level of increase in system availability occurs.
- The selected alternative supports agency business continuity objectives.
-

Legal/Regulatory:

- The selected alternative supports compliance with licensing agreements.
- The selected alternative enables the agency to meet data retention and data discovery requirements.
-
-
-

Environmental:

- The selected alternative results in an overall reduction in power consumption.
- The selected alternative requires less physical space for data center infrastructure.
-
-
-

Public Interest:

- The selected alternative ensures increased operational reliability to avoid damage to BPA's reputation.
-
-
-
-

BPA's People and Processes:

- The selected alternative includes the redesign and implementation of new processes and procedures for server infrastructure support.
- Project implementation should include the update of relevant policies in support of the new environment.
- The selected alternative includes a robust training program to support the new hardware, processes and policies.
-
-

Other Factors:

- Hardware vendors considered for selection should be well established in the industry.
-
-

NARRATIVE

►
►

24	**Describe the proposed investment and the alternatives considered:**	HELP

Proposed Investment:

The project will retain a system "integrator" from a leading industry consulting firm that has extensive server infrastructure modernization experience. The integrator will work with vendor partners (Microsoft, Cisco and HP) for actual optimization, server consolidation, virtualization and system re-hosting. The current server replacement schedule will be reconfigured to transition to new "blade" servers and associated chassis. That schedule will be designed to fully utilize existing equipment through the transition. At project end, roughly 720 blade servers will be in-service.

An agency employee project team will be assembled to support the project. It is expected that approximately 8 BFTEs will need to be dedicated full-time to the project, while a considerably larger number of subject matter experts will be called on for intermittent support. The BFTEs will be responsible for overall project management as well as process redesign, policy updates, training development, training delivery, and system testing/quality assurance. The integrator and associated contractors will be responsible for design, software development/implementation and developing a testing protocol.

This alternative produces the largest decrease in server numbers, eliminating approximately 240. It also results in lower life cycle costs, although the initial investment costs are higher. This solution reduces the data room footprint and power requirements far more than other options considered.

Next best alternative:

The next best alternative is to proceed with the server infrastructure modernization without the integrator services. This would be an agency-led effort that would replace the hardware on much the same schedule. However, the Ross and Munro data centers would not be transitioned to the "blade" style servers. Those facilities would be updated with modern servers, but within the existing chassis limitations. This approach would reduce the number of servers by approximately 100. System monitoring software would be installed, but would be primarily focused on the Headquarters data center.

The value of this alternative is in the lower initial capital investment requirement. While less costly initially, this alternative does not provide the benefits that the recommended alternative produces. In fact, this alternative only delivers about 40% of the benefits for the recommended alternative. This alternative will result in higher life cycle costs, fewer performance and reliability improvements and less "green" data centers at Ross and Munro.

Status Quo:

A status quo or "business as usual" case was considered and is included in the financial analysis. While it is possible to continue to operate under this approach, it produces none of the benefits and subjects the agency's server infrastructure to increasing pressure and risk. This approach results in the highest life cycle costs of all the alternatives.

NARRATIVE

25 Risks Addressed by this Project: HELP

This project is related to two items on BPA's Top Enterprise Risk list for FY 2008 – Inadequate Business Processes and Disruption of Critical Functions. This project will provide some measure of mitigation for each of those risks.

This project also supports two of the strategic objectives in the Agency Strategy Map for 2010 – 2016. Those items are Technology Innovation (I5) and Systems and Processes (I1). The objectives for this project are aligned with the two referenced agency objectives.

This project addresses the following risks (see the attached risk scales for the context of the ratings used):

Risk: Risk that the agency's failure to maintain adequate compliance with licensing agreements leads to legal rulings or fines, which results in reputational and financial damage to BPA .
Likelihood: Likely – Could occur once every two years
Consequence: Moderate – Penalties would be limited for the first occurrence. Multiple infractions would have the potential for more severe consequences. Total impact could range up to $100k per year.

Risk: Risk that inadequate server capacity planning leads to the purchase of unnecessary additional servers, which results in higher costs and inefficient service.
Likelihood: Possible – Will likely happen within 5 years
Consequence: Moderate – The impact would be subtle in the beginning, but left uncorrected could become quite pronounced resulting in unnecessary staffing and underutilized hardware. The incremental cost could range up to $5k per server.

Risk: Risk that the lack of internal expertise related to assessing IT requirements leads to inappropriate hardware purchases, which results in integration failures and unavailability of BPA data.
Likelihood: Almost Certain – Will occur at least once a year
Consequence: Minor – On an individual event basis, the impact is limited, perhaps up to $3k per situation. Widespread instances would increase the consequences significantly.

26 Financial Analysis: HELP

Describe the assumptions for capital costs:

The capital cost estimates were developed by the project team based on the best information available:

- Hardware costs were first estimated at today's prices, then de-escalated 5% per year to account for the natural efficiency gains from technology maturation. Those figures were entered into the financial model and allowed to escalate with the model-calculated general price escalation.
- BFTE resources were priced at an annual cost of $134k per BFTE and allowed to escalate by the model's general price escalation.
- A contingency was included in the cost estimates based on the hardware costs only and totals $700k. The contingency is intended to allow the adoption of a new generation of "blade" servers, should the technology mature within the project window.

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Describe the assumptions for non-recurring project expense(s):	
The expense portion of the project costs is comprised of costs for process redesign, policy updating, training development and training delivery. These costs are primarily BFTE labor and are priced as described in the capital costs assumptions.	
Describe the assumptions for incremental benefits:	
The calculation of benefits is detailed in the financial analysis model. In general, the benefits include labor savings, maintenance savings, power/cooling savings and licensing avoidance.	
Describe the assumptions for incremental costs:	
The project results in limited additional costs for site license fees for the monitoring software and the addition of one BFTE to support the new system monitoring functions and to track and report compliance with the new data infrastructure policy.	
NPV of the recommended alternative:	**$ (7.8) Million**
NPV of the next best alternative:	**$ (9.7) Million**
Please discuss the NPV results:	
The NPVs for the recommended alternative, next best alternative and status quo are ($7.8m), ($9.7m) and ($11.3m), respectively. They are all negative because providing IT server infrastructure is a basic business function where the investment doesn't really "pay" for itself, rather the costs are recovered in rates. The NPVs do illustrate the relative life cycle costs of the alternatives. The recommended alternative is lowest cost because it produces the most savings, even though it requires a greater up-front capital investment than the alternatives.	
Discuss the Sensitivity Analysis and Results:	
Note: Sensitivity analysis is required for projects over $7m. Agency Asset Management intends to develop more detailed guidance and assistance with skills development around this topic. The text here represents a rudimentary approach to sensitivity analysis. This project will install new technologies to improve efficiency and reduce operating costs. Given the large scope of this project and its multi-year span, there are a number of uncertainties that may affect the project. The key uncertainty that faces this project is the cost of the server hardware. The business case includes $3.5m for server hardware. That cost estimate assumes the technology available at the time the project was scoped (about 3 months ago). There are two possibilities for server costs. The costs for the hardware scoped in the business case could decline as the technology matures. That decrease could be as much as 20% or $700k. The more likely scenario is that server technology will	

NARRATIVE

continue to evolve and the project will have the opportunity to adopt the next generation of server hardware sometime during the course of the project. That increase could be as much as 35% or about $1.2m.

Under these two uncertainties, the business case NPV of ($7.8m) could range from ($7.1m) with the cost decrease, to as high as ($8.9m) if the decision were made to adopt the next generation of server hardware. It is possible that the new generation of hardware would produce additional efficiencies, but no additional savings are assumed in the recalculated NPV. These uncertainties are the basis for the cost target thresholds proposed in section 28.

27	**Project execution risks and management controls:**	**HELP**

During implementation, the project faces the following key execution risks (see the attached risk scales for the context of the ratings used):

Risk: There is a risk that the new infrastructure design could result in conflicting technologies which would result in a reduction in the efficiencies and other benefits the project is intended to deliver.
Likelihood: Almost Certain – A 90% or greater chance of occurrence
Consequence: Major – Up to 50% of the $10 million of project benefits could be at risk.
Mitigation: This risk will be mitigated through the use of the "integrator" who will partner with BPA staff to create a holistic design and implementation plan to ensure alignment with industry best practices. Further, a final design review will be conducted by two independent industry experts to provide a final compatibility determination.

Risk: There is a risk that insufficient internal labor resources are assigned to the project, resulting in schedule delays or in additional costs for contractor resources.
Likelihood: Possible – There is a 50% chance this could occur given the number of concurrent projects in motion during the same time frame.
Consequence: Moderate – The incremental cost if contractors are deployed could reach $200k per resource per year. Delays aren't as costly because the existing infrastructure is fully functional, just not as efficient.
Mitigation: The IT project management office has implemented a cross-project resource evaluation team. Resource requirements from all projects are updated weekly, gaps are triaged by criticality and resource re-deployment (or acquisition) decisions are implemented within the next week.

Risk: There is a risk that the transition to the new environment (re-hosting) could encounter unknown or unanticipated technical issues that cause service disruptions.
Likelihood: Possible – There is a 40% chance of at least one event occurring, given the number of new software components being integrated for this project.
Consequence: Minor – The number of servers involved make a single incident reasonably manageable.
Mitigation: The current environment will be maintained in parallel with the new environment until full quality assurance testing can be completed. Existing hardware will only be decommissioned following the cutover manager's final review and approval.

NARRATIVE

28	Recommended Targets & Thresholds for PBVIEWS:	HELP

Measure Description:	**PROGRAM COST**	
Progress Indicators (PI):	**GREEN:**	Direct capital costs are forecast to be less than or equal to $12.8 million.
	YELLOW:	Direct capital costs are forecast between $12.8 million and $14.0 million.
	RED:	Direct capital costs are forecast to be greater than $14.0 million.
End of Project Target:	**GREEN:**	Direct capital costs are less than or equal to $14.0 million.
	RED:	Direct capital costs are greater than $14.0 million.
Measure Owner:	Joe Owner	
Point of Contact:	Jim Contact	
Subject Matter Expert:	Jill Expert	
PBVIEWS Entry:	Jerry Entry	

Measure Description:	**PROJECT SCHEDULE**	
Progress Indicators (PI):	**GREEN:**	The project is forecast to be completed by 3/31/2013.
	YELLOW:	The project is forecast to be completed between 3/31/2013 and 6/30/2013.
	RED:	The project is forecast to be completed after 6/30/2013.
End of Project Target:	**GREEN:**	The project is completed by 6/30/2013.
	RED:	The project is completed after 6/30/2013.
Measure Owner:	Joe Owner	
Point of Contact:	Jim Contact	
Subject Matter Expert:	Jill Expert	
PBVIEWS Entry:	Jerry Entry	

Measure Description:	**PROJECT / PROGRAM SCOPE OR CAPABILITY**	
Progress Indicators (PI):	**GREEN:**	The forecast is for the servers to be replaced, software installed and processes/policies updated as specified in the business case.
	YELLOW:	None
	RED:	The forecast is less than green.
End of Project Target:	**GREEN:**	The servers are replaced, software installed and processes/policies updated as specified in the business case.

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	RED: Less than green.
Measure Owner:	Joe Owner
Point of Contact:	Jim Contact
Subject Matter Expert:	Jill Expert
PBVIEWS Entry:	Jerry Entry
Measure Description:	**OTHER PERFORMANCE MEASURE(S)**
Progress Indicators (PI):	**GREEN:**
	YELLOW:
	RED:
End of Project Target:	**GREEN:**
	RED:
Measure Owner:	
Point of Contact:	
Subject Matter Expert:	
PBVIEWS Entry:	

29	**What are the appropriate metrics to judge the success of the investment once it is placed in service?**	**HELP**

There are several areas where this investment is expected to yield measurable results. The following metrics and associated baseline measurements would be appropriate for evaluating the project after it has been in service for at least 16 months:
- The number of servers should be reduced by 25% (from 960 to 720)
- The number of category II unplanned outages should be reduced by 40% (currently an average of 8 annually)
- HQ, Ross and Munro data center energy usage should be reduced by 35% (currently ~443,000 KWh per month)
- The Microsoft Operations Framework (MOF) maturity ratings for server configuration management and storage management should improve to Level 3 (currently Level 1)
- Maintenance costs per installed server should be reduced by 15%. This is an indication of life cycle costs. It will be measured by annual maintenance costs for the Infrastructure organization (JI) divided by the number of installed servers. The current baseline calculation is $4.2m divided by 960 or $4,375 per installed server.

Financial Model and Other Information	**HELP**

Double click on icon below to open up the EXCEL MODEL workbook:

Financial Model EXAMPLE 08312009.x

Risk Scales

HELP SECTION ON SPECIFIC QUESTIONS

HELP SECTION ON SPECIFIC QUESTIONS	
SECTION C: **PROJECT INVESTMENT SUMMARY TABLE**	The Project Summary Investment table from the embedded Excel financial model must be copied and pasted into the box provided. The Excel model is embedded in the template in the final section (Financial Model and Other Information): From the "Summary" worksheet of the Excel model, highlight the complete table and click on the "Copy" icon. Switch to the Word template, place your cursor inside the box provided and select Edit, Paste Special, and then choose Picture (Enhanced Metafile). You will need to replace the summary table if the numbers in the Excel model change, so this step is better left until the business case is nearly complete.
Question #19 **BUSINESS CASE SYNOPSIS**	The business case synopsis should be completed only after the rest of the business case is complete. The synopsis should be brief, but should capture key points from each section of the business case. The synopsis discussion should be organized to follow the order of the template – background, objectives, etc. No new information should be included in the synopsis. If you cut and paste from the rest of the template, be careful to be brief and to focus on just the key points.
Question #20 **APPROVALS**	All approvals must be complete before the business case is submitted for agency approval. The Asset Accounting review requires that you consult with Asset Accounting to obtain the approval signature. The purpose of the Asset Accounting review is to verify that the project costs are properly classified as either expense or capital. The signature should be from the Asset Accounting representative who performed the review. You should obtain and retain an e-mail or other document from the Asset Accounting representative to support their approval. The final approval (Asset Category Approval) should generally be a vice president. In addition to filling out their name and date on this electronic form, some form of supporting documentation for the approval must be sent to Agency Asset Management. That documentation can be an e-mail from the approver indicating approval, a hard copy signature, PDF signature, or equivalent.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #21 **NARRATIVE** **Project Context/Background**	In general, this section is the problem statement. You should describe the current state and explain how we arrived at the current state. What has (or hasn't) occurred that now requires this investment? This section should include (where appropriate): A description of the facility/equipment/asset that is to be replaced, expanded, reinforced or upgraded. Include location, capability, purpose, etc. The condition of the equipment, including supporting inspection and maintenance information. The requirements or standards that are not being met (or will not be met) by the current equipment.
Question #22 **NARRATIVE** **Investment Objectives**	In this section, you will describe the objectives of the investment. Select the general objectives from the supplied options for A and B. Then describe the specific objectives in section C. Your explanation should: Describe the desired future state – what does this investment need to accomplish? This is not a description of the project; it is a description of the outcome you are trying to achieve. Be specific – comply with NERC standard X, increase capacity by X, improve response time to X, reduce outages by X, serve new customer X, etc.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #23 **NARRATIVE** **Key Decision Criteria**	The key decision criteria are the factors you will use to evaluate the alternatives to meeting your investment's objectives. Here you are identifying which factors will be important to you as you evaluate your alternatives to choose the best solution. You may be unable to identify criteria in each of the categories. The following are some examples: **Business/Finance:** • The solution must be least life cycle cost. • Reliability must increase by at least X. • The solution must be accommodated within the FY XXXX budget. • Capability must increase by at least X. • The rate impact must be less than X. **Legal:** • Contract provision X must be met. • At minimum, the solution must comply with regulation X. **Environmental:** • The solution must produce a minimum flow of X. • The solution should reduce energy consumption. • The solution should have no carbon footprint. • The solution must be consistent with renewable resource goals. **Public Interest:** • The solution must accommodate public input. • The solution must support regional goals for X. **BPA's People and Processes:** • The solution must add no workforce. • The solution must be consistent with BPAM X. • The solution must have executive support. • Implementation must be accomplished with existing workforce.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #24 **NARRATIVE** **Proposed Investment**	Describe the proposed investment or recommended alternative. Be specific: • What is being purchased, constructed or implemented? • Where will the work be performed? • When will the work be completed? • What resources are required to complete the project? • How will the project be conducted? • Explain why the proposed investment meets the key decision criteria better than the other options considered. **Next Best Alternative:** Describe the next best alternative – what would you do if you didn't make the proposed investment? Explain why the next best alternative is not as attractive as the recommended alternative. If any other alternatives were considered, briefly discuss them and why they were rejected. **Status Quo:** Describe the status quo if it was not described as one of the alternatives. The status quo is "business as usual" and isn't necessarily a "do nothing" case. It describes what you will do to get by, or continue to get by, instead of pursuing one of the alternatives.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #25 **NARRATIVE** **Risks Addressed by this Project**	**1. Provide Agency risk management context:** a. Define relationship of project to applicable **Agency** Top Enterprise Risks. b. Define relationship of project to applicable **Agency** strategic objectives. **2. Outline the risks to the Agency if this investment does *not* occur:** **a.** Provide a concise risk statement for each risk identified. **i.** Example: "Risk that *(description of event)* leads to *(description of outcome expressed in terms of impact on the Agency objectives)*" b. For each risk statement, quantify the level of risk in terms of Likelihood (probability of event occurring) and Consequence (impact on the organization). Do not use arbitrary or undefined ratings. Refer to the pre-defined Agency scales if necessary.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #26 NARRATIVE [Financial Analysis]	Respond to each of the prompts concerning the financial analysis contained in the embedded financial analysis model. When describing assumptions: Explain how you estimated your capital costs and non-recurring project expenses. What contingency is included in the estimates? Describe the incremental costs and benefits. This information should provide a general understanding of the costs and benefits that are included in the financial analysis model. In the financial analysis model, you will be required to detail the calculation of those costs and benefits. When discussing the NPV results, you may need to explain why the project NPV is negative, or why the recommended alternative may have a less attractive NPV than the next best alternative. A sensitivity analysis is required for projects over $7 million which have key cost/benefit drivers that are highly uncertain. The sensitivity analysis should include a range of assumptions to address the risk around the delivery of the expected value of the project, as measured by NPV or NCR. This should be done for all alternatives, including the status quo. The results should show the NPV of each alternative at the various sensitivity levels. You may use this analysis to support the cost threshold that you will propose in Section 28. Before proceeding with this analysis, consult the ACPRT or your finance subject matter expert to discuss the best approach for this analysis.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #27 **NARRATIVE** **Project Execution Risks and Management Controls**	**1. Describe the Project Execution risks related to this project:** **a.** Provide a concise risk statement for each project execution risk that may impact project performance, cost, and schedule milestones (Example: "Risk that *(description of event)* leads to *(description of outcome expressed in terms of impact on the project objectives or deliverables).*" b. For each risk statement, quantify the level of risk in terms of Likelihood (probability of event occurring) and Consequence (impact on the organization). Do not use arbitrary or undefined ratings. Refer to the pre-defined Agency scales if necessary. Avoid boilerplate language (e.g. "risk that schedule overruns results in project delays"); each risk should be supported by specific and verifiable supporting information. c. For each risk, outline the details of your treatment plan that will reduce the level of risk. The level of information here should follow S.M.A.R.T. principles; information provided should be Specific, Measurable, Actionable, Relevant, and Time-oriented. d. If management is willing to accept all (or a portion of) the risks identified, supporting rationale should be provided.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #28 NARRATIVE [Recommended Targets & Thresholds for PBVIEWS:]	In this section, you will propose targets and thresholds for cost, schedule and scope. There is a fourth field available (Other Performance Measure) for an additional target, if appropriate. The targets should be focused on the project-end state: total direct capital costs, final in-service date and complete delivered scope. The thresholds you propose, above the direct capital costs and expected in-service date in your business case, should be based on some level of thought or analysis regarding the uncertainty in your project. What, in particular, is uncertain and what does that mean for cost, schedule and scope? The following example is a typical set of targets for cost, schedule and scope. There are many actual examples available on the Agency Asset Management SharePoint site. You can access those by browsing the approved projects folders and looking at the ACPRT or CAB decision documents. ***PROJECT COSTS:*** Program Indicators: Green: Total direct capital cost is forecast to be $8.0 million or less. Yellow: Total direct capital cost is forecast to be between $8.0 million and $8.9 million. Red: Total direct capital cost is forecast to be greater than $8.9 million. End of Project Target: Green: Total direct capital cost is $8.9 million or less. Red: Total direct capital cost is greater than $8.9 million. ***PROJECT SCHEDULE:*** Project Indicators: Green: Project is forecast to be placed in service by 6/30/2014. Yellow: Project is forecast to be placed in service between 6/30/2014 and 8/31/2014. Red: Project is forecast to be placed in service after 8/31/2014. End of Project Target: Green: Project is placed in service by 8/31/2014. Red: Project is placed in service after 8/31/2014. ***PROJECT/PROGRAM SCOPE OR CAPABILITY:*** Program Indicators: Green: Component replacements are forecast to be completed at all of the 20 sites identified. Yellow: Component replacements are forecast to be completed at between 19 and 20 sites. Red: Component replacements are forecast to be completed at less than 19 sites. End of Project Target: Green: Component replacements are completed for at least 19 of the sites identified. Red: Component replacements are completed for less than 19 of the sites identified.

HELP SECTION ON SPECIFIC QUESTIONS	
Question #29 NARRATIVE **What are the appropriate metrics to judge the success of the investment once it is placed in service?**	Describe the metrics that you would use to measure the project's success, once it has been implemented. These metrics should be specific and measurable, wherever possible. Provide the baseline (pre-implementation) measurement for those metrics and the expected performance for those metrics following project implementation. Examples of metrics would include: capacity is X and is expected to be Y, response time is X and is targeted to be Y, outage minutes are X and will improve to Y, customer satisfaction levels are X and are expected to move to Y, etc. You may have already touched on these metrics in the objectives discussion in section 22. It's possible that the metrics are not clearly identified at this point in the project's development. In those cases, provide a commitment as to when the project metrics and current baseline measurements will be provided to the ACPRT.
Financial Model and Other Information	The Excel model that supports the business case must always be saved in the dedicated spot that it occupied when the template was delivered to you. The remaining area in this section may be used to attach additional information that supports the business case: • Limit attachments to information that is clearly relevant to the business case: maps, project timelines, cost detail, etc. • Relevant and focused excerpts from documents are more useful than entire documents. • You may also note and describe a document that is available, but not attached if the information in that document has a more general relation to the project, but not being specifically referenced. • If you attach entire documents select Insert/Object/Create from File and check the "Display as Icon" box. You may rename your attached file to a more meaningful name by clicking on the "Change Icon" button.

661.0 PURPOSE

This Chapter establishes Bonneville Power Administration's (BPA) policy and framework for developing and reviewing, and maintaining asset management strategies.

661.1 DEFINITIONS

A. Assets: Plant, machinery, equipment, property, buildings, structures, vehicles, servers, software applications and other items or related systems that have a distinct and quantifiable business function to BPA and its Federal Columbia River Power System (FCRPS) partners with a useful life expectancy greater than one year.

B. Asset criticality: Relative importance of an asset or asset system to meeting the agency's reliability, availability, adequacy and other objectives and standards.

C. Asset system: Set of assets that interact and/or are interrelated so as to deliver a required business function or service.

D. Life cycle: The phases of an asset's life, beginning with identifying the need for an asset and ending with disposal (decommissioning, retirement, sale) of the asset. The main stages of an asset's life cycle include: create/acquire, operate, maintain and renew/dispose.

E. Planning levels: Forecasted capital and expense spending levels to implement the investment, maintenance, and other components of asset management strategies.

661.2 POLICY

BPA and its FCRPS partners must manage capital investments and maintenance with a comprehensive understanding of the long-term costs, benefits and risks to the agency and the region. Asset management strategies are key to ensuring that critical assets operate reliably, meet availability requirements, and provide adequate capacity into the future, and that long-term asset costs will be prudent and economic.

Asset management strategies must be developed and maintained for Transmission, Federal Hydro, Facilities, and Information Technology (IT) at minimum, and category asset managers are assigned the lead role. The strategies must be directed at meeting the agency's Asset Management Policy[1], which calls for BPA to invest in, maintain, and operate assets to enable reliability standards, availability requirements, regional adequacy guidelines, efficiency needs, environmental requirements, safety and security standards, and other requirements to be met. It also calls for minimizing the life cycle cost of assets when practical. The policy refers to these goals as *long-term outcomes*, and they are derived from the agency's mission, vision and strategic objectives.

Asset management strategies should answer these questions:

- Which assets are critical to achieving the long-term outcomes?
- What performance objectives should we set for critical assets?
- How are our critical assets performing today?

[1] See BPA Manual Chapter 660

- What are the performance gaps to meeting the objectives, and which gaps should we close?
- What are the obstacles to closing the gaps, and which risks should we manage?
- What should our strategies be?
- What are the anticipated costs?

Specifically, the asset management strategies must:

- Assign priority to the most critical assets that are at greatest risk of operating failure, capacity inadequacy, environmental damage or noncompliance, security breach or noncompliance, health and safety issues, or obsolescence. Example factors for determining the criticality of assets are included at Appendix A;
- Cover all four phases of asset life (create/acquire (investment), operate, maintain, and renew/dispose), with particular focus given to the investment and maintenance phases;
- Cover a 10-year planning horizon at minimum. A 7-year planning horizon for information technology assets is acceptable due to the shorter lives of these assets;
- Be driven by long-term, results-oriented performance objectives for assets and by assessments of obstacles to meeting the objectives. Asset performance objectives must be aligned with the agency's strategic objectives and with the long-term outcomes;
- Identify and evaluate alternative approaches to meeting the asset performance objectives, with justifications provided for the selection of preferred approaches. The preferred approach should normally be the lowest life cycle cost solution among alternatives that are viable. "Viable" is defined as operationally sound and achievable in terms of meeting the reliability, availability, adequacy or other asset performance objectives that have been set;
- Take into account staffing, supply chain, and other constraints on strategy delivery; and
- Apply the agency's common planning assumptions, such as inflation rate, market price forecast, and load forecast.

Strategies should include an integrated approach to maintenance, equipment sparing, and replacements that seeks to minimize life cycle costs. The integrated approach should be condition-based, with priority assigned to the most critical assets at greatest risk of operating failure, environmental damage or noncompliance, or health and safety issues. Assets should be considered for replacement if:

- Asset health poses an unacceptable risk of operating failure, and the cost of replacement is lower than the expected life cycle cost of repairs;
- Asset capability does not meet acceptable performance standards due to premature wear, design problems, changed usage patterns, or changes in system operations;
- Asset technology is inferior or obsolete, and the life cycle savings from early replacement outweigh the cost of replacement;
- Replacement parts or technical expertise are no longer available to ensure asset performance to acceptable standards;

- Security risks, health and safety risks, or environmental risks are unacceptable, and the life cycle cost of replacement is lower than the life cycle cost of repair or other viable alternatives; or
- The agency's business continuity objectives would not otherwise be met, and the life cycle cost of replacement is lower than the life cycle cost of other, viable alternatives; or
- Risks to meeting statutory, regulatory or other legal obligations are unacceptable, and the life cycle cost of replacement is lower than the life cycle cost of other, viable alternatives.

Asset management strategies must be developed using the Framework for Developing Asset Management Strategies at Appendix A. The Framework is designed to meet the policy requirements in this Chapter, and it is based on leading practices and the agency's risk management approach.

661.3 RESPONSIBILITIES

Key responsibilities for implementing this Chapter follow:

A. Category Asset Managers

BPA has identified seven asset categories: Transmission, Federal Hydro, Facilities, IT, Columbia Generating Station, Energy Efficiency, and Fish & Wildlife. Asset categories are led by Category Asset Managers. Category Asset Managers, along with their staffs, develop and implement asset management strategies, plans, processes, and policies for their asset categories. With regards to this Chapter, Category Asset Managers are responsible for (1) ensuring that their asset category follows this Chapter, including the Framework at Appendix A, (2) presenting and communicating strategies and obtaining approvals, and (3) managing the implementation of strategies.

B. Asset Management Executive Sponsors

Asset Management Executive Sponsors are comprised of Vice Presidents from each asset category, the Chief Financial Officer, the Chief Risk Officer, and the EVP-Corporate Strategy Officer. With regards to this Chapter, sponsors provide direction to the Agency Asset Manager and Category Asset Managers on developing asset management strategies and on making changes to Appendix A of this Chapter.

C. Capital Allocation Board (CAB)

The CAB is chartered and comprised of the Administrator, Deputy Administrator, Chief Operating Officer, the Chief Financial Officer, and the Chief Risk Officer, and the EVP-Corporate Strategy. The CAB reviews proposed asset strategies, and determines the applicability of this Chapter to the agency's asset categories.

D. Agency Asset Management (AAM)

The Agency Asset Management team is comprised of the Agency Asset Manager and staff. The AAM leads the development and monitors implementation of agency-level policies and processes. The AAM advises Category Asset Managers on developing their asset management strategies, establishes the schedule and coordinates the agency-level review process for strategies, and communicates the agency's common planning assumptions.

661.4 PROCESS

A. Applicability. This Chapter applies to the Transmission, Federal Hydro, Facilities and IT asset categories at minimum. The CAB, in consultation with affected business units and the Asset Management Executive Sponsors, determines whether and how this Chapter should apply to additional asset categories.

B. Submitting strategies. Agency Asset Management will establish a schedule for submitting strategies for agency-level review, normally on a 2-year cycle. The strategy document that Category Asset Managers submit for corporate and external stakeholder review should include:

- A description of business environment;
- A summary of asset criticality, including rationale;
- Asset performance objectives, measures and end-stage targets;
- A summary of current asset performance (gap analysis);
- Summary results from risk assessments;
- Strategies;
- Proposed planning levels; and
- Continuous improvement plan.

C. Approving strategies. An asset category's strategy document must be formally approved by the Category Asset Manager and the business unit's VP-Asset Management or VP-Internal Business Services. The strategy is also subject to concurrence by the Capital Allocation Board.

Strategies are subject to review and comment by customers and other stakeholders through the agency's Integrated Program Review or similar public process.

D. Maintaining this Chapter. At minimum, this policy will be reviewed at the beginning of the agency's 2-year planning cycle. The Asset Management Executive Sponsors are authorized to modify and re-issue the Framework at Appendix A to this Chapter.

661.5 REFERENCES

A. Asset Management Policy, BPAM 660

B. Publicly Available Specifications, PAS 55-1 & PAS 55-2, November 2008

D. OMB Circular A-123, December 21, 2004

E. GAO Cost Estimating and Assessment Guide, "Best Practices for Developing and Managing Capital Program Costs, March 2009

Appendix A
Framework for Developing Asset Management Strategies

Asset management strategies chart the course for achieving the agency's long-term outcomes for assets by setting asset performance objectives, prioritizing risks, developing strategies, and forecasting costs and cost uncertainties. The strategies also serve to:

- Inform, and ensure consistency with, the agency's strategic direction, key agency targets, and balanced scorecards;
- Inform and involve customers and other stakeholders on proposed investment and maintenance levels; and
- Provide concrete direction on the priorities, approaches, and methods to be followed for developing asset management plans.

Asset management strategies must be developed for the Transmission, Federal Hydro, Facilities, and IT asset categories at minimum, and Category Asset Managers play the lead role. The strategies must be developed through the seven iterative steps that follow. These steps are designed to:

- Fulfill the policy requirements of this Chapter (see section 661.2);
- Establish in a clear line-of-sight between the agency's strategic direction, the agency's Asset Management Policy (BPA Manual Chapter 660), and its asset management strategies; and
- Implement leading practice guidelines and the agency's risk management framework.

Steps	*Questions answered*
1. Describe the business environment	*What demands will be placed on our assets?*
2. Identify assets and asset systems and Determine their criticality	*Which assets are critical to achieving the long-term outcomes?*
3. Specify key standards for managing assets and Establish asset performance objectives, measures and targets	*What performance objectives should we set for critical assets?*
4. Assess the current state of assets	*How are our critical assets performing today?* *What are the gaps to meeting the performance objectives, and which gaps should we close?*
5. Assess risks to meeting the objectives and performance measures	*What are the risks to closing the gaps, and which risks should we manage?*
6. Prepare strategies	*What should our strategies be?*
7. Forecast planning levels	*What are the anticipated costs?*

Each of the seven steps is described below. Importantly, step 6 includes a test for assessing the adequacy of draft strategies. The agency's common planning assumptions should be employed, particularly in steps 1, 5, 6, and 7. The planning assumptions may be found at: http://internal.bpa.gov/sites/asset-mgt/cpa/default.aspx . The results from each of the seven steps must be documented.

Step 1 -- Describe the business environment. Step 1 summarizes the business environment in which the asset category operates and describes the asset base. This includes such information as:

- Description of the asset category (characteristics of assets covered and functions they perform).
- Customers and stakeholders served, and what they are seeking.
- Products and services the assets make possible.
- Owner/operator/funding roles (if owner/operator is not BPA).
- Strategic environment, including demands anticipated to be placed on assets:
  - Future load growth;
  - Generation integration requirements for new resources;
  - Evolving regulatory standards and other legal requirements;
  - Evolving national energy policies;
  - Evolving state energy policies;
  - Future market (energy) price uncertainty;
  - Commodity material availability and cost uncertainty (steel, copper, etc.);
  - Strategic issues and management challenges for maximizing the long-term value of assets; and
  - Staffing/skills constraints.

Step 2 – Identify assets and asset systems and determine their criticality. Step 2 identifies assets and asset systems for strategy development and asset plan purposes. It also delineates more critical assets from less critical assets.

Identify assets. Assets must be identified consistent with the definition at 661.1. Typically, components of machinery, structures, and other plant normally do not have value to BPA and its FCRPS partners unless they operate together to meet a business purpose or need. For example, wood poles, high voltage line, conductors and other components have value to BPA only when they are installed and operated as a transmission line. Transmission lines are examples of assets, as are hydroelectric plants and software to provide integrated customer billing and contracts functions.

Group assets into asset systems. For purposes of developing strategies, it is often useful to group assets into systems. Asset systems are sets of assets that have similar functional importance to BPA, or together deliver a business function or service. Examples of asset systems are:

- Transmission paths, comprised of transmission lines, substation equipment, and other assets that, operating together, integrate generation and transmit power to load or market;
- Willamette Valley hydroelectric plants;
- General office facilities in the Portland/Vancouver area; and
- Desktop hardware.

Designate critical from non-critical assets. Assets and asset systems have different levels of importance when it comes to meeting reliability, availability, adequacy and other long-term outcomes. Therefore, each organization should identify key importance factors and establish the criticality of the assets and asset systems under its purview.

Asset criticality identifies the relative importance of an asset or asset system to meeting the reliability, availability, adequacy and other standards in the long-term outcomes. For example, Main Stem Columbia

hydroelectric plants are the backbone of the federal hydro system, contributing the majority of energy, ancillary services, and non-power benefits to the Pacific Northwest. Further, the value of availability at the margin is higher at some Main Stem plants than for plants in other strategic classes, making these the most critical plants in terms of meeting reliability and availability outcomes.

To determine the criticality of an asset or asset system, Category Asset Managers should consider such factors as:

- The impact on regulatory compliance if asset failure (e.g., forced outage) occurs;
- The load service impact if failure occurs;
- The energy, storage, or ancillary service contribution of the assets;
- The revenue or cost impacts that would result from a failure;
- The disruption to business continuity and critical business processes that would result from failure; and
- The safety or security impact that would result from failure.

Ideally, asset criticality will be determined on a rank scale, but simple critical/non-critical designations may also suffice. The criticality of assets must be documented and kept secure while also providing ready access to those who develop and execute asset strategies and plans. The designations should normally be maintained in the asset category's asset register. An asset category's strategy should document the basis and rationale for designating the criticality of its assets.

In later steps, priority will be assigned to the most critical assets that are at greatest risk of operating failure, capacity inadequacy, environmental damage or noncompliance, security breach or noncompliance, health and safety issues, or obsolescence.

Step 3 -- Specify key standards and requirements for managing assets and asset systems. Key standards and requirements referred to in the long-term outcomes must be singled out so that strategies and asset plans can be developed and executed to meet them. This includes key statutory, regulatory, Federal directives/policy, contractual, and internal standards and requirements that are important to investing, maintaining, and operating the asset category's assets.

The standards must be readily accessible to those responsible for developing and executing asset strategies and plans, and they are preferably maintained in the agency's Governance Risk Control electronic system or other repositories.

Establish performance objectives, measures, and end-stage targets. The key standards must then be translated into performance objectives, measures and end-stage targets for assets and asset systems. Taken together, the objectives, measures, and targets should answer the question: What performance objectives should we set for critical assets?

Asset or asset system objectives are statements of the results that assets and asset systems must be managed to achieve in order to meet the long-term outcomes in the asset management policy. An example of an asset management objective is "Transmission path X meets risk tolerances for unplanned outages." At

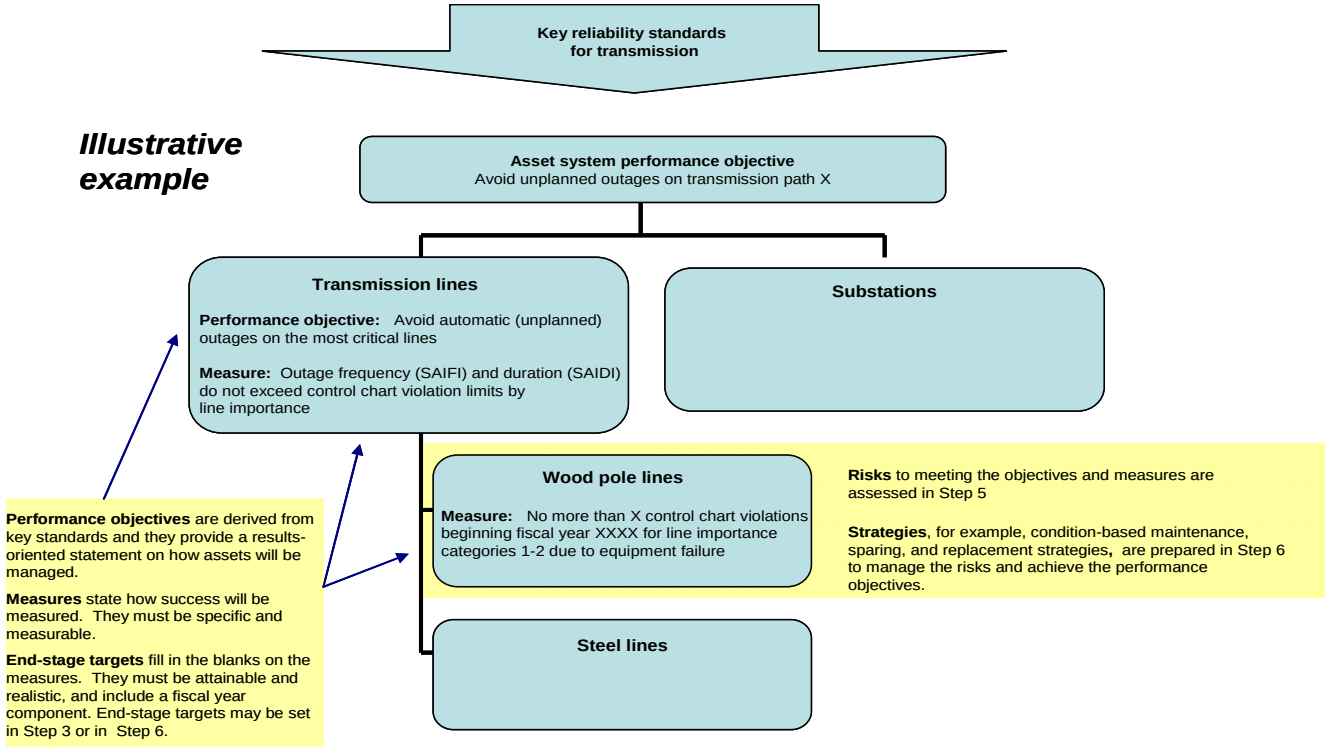
minimum, asset performance objectives must be set at the asset category level, but business units are encouraged to set them at the critical asset or asset system levels as well.

Asset or asset system performance measures specify how achievement of the objectives will be measured and tracked. Measures provide the metric, or unit of measure, that will be used to determine success or failure in meeting the objectives. Quantitative measures are strongly preferred over qualitative measures. Consideration should be given to including leading as well as to lagging indicators.

An *end-stage target* must be set for each performance measure. The end-stage targets may be set in Step 3, or later, when strategies are developed in Step 6. End-stage targets should capture the "future state" level of performance needed to meet the objectives.[2] End-stage targets should be ambitious but achievable, with cost and other risk factors taken into account. They should normally be stated as a range of acceptable results as of a specific fiscal year.

The objectives, measures and end-stage targets that are set in Step 3 are subject to adjustment as risks are assessed (Step 5) and as strategies are developed (Step 6).

Asset performance objectives, measures and end-stage targets must be documented so that they can be measured efficiently and readily understood by a range of audiences. Documentation should normally include such information as measure definition, sources of data, units of measure, algorithm or formula, and measure owner. See Appendix B for sample documentation of a measure and end-stage target.



[2] End-stage targets are not the same as progress indicators. Progress indicators are intermediate targets to monitor progress toward meeting the end-stage targets, and they may extend over a period of years. Progress indicators are set later, after asset strategies are completed and as asset plans are developed.

Step 4 - Assess the current state of assets. Step 4 assesses the health, performance history and cost history of assets as they now exist. Normally, current state assessments address:

- Asset demographics;
- Condition of assets, with gaps in condition assessment information noted;
- Asset performance issues, for example, failure trends, capacity shortfalls, replacement and maintenance backlogs, key pollution abatement issues, and key security needs; and
- Historical costs and source.

Importantly, Step 4 must also determine the current performance level of assets in terms of the objectives, measures and end-stage targets that were set previously. The gap between current performance levels and desired "future state" performance will be the focus of the risk assessment and strategy development steps that follow.

Step 5 -- Assess obstacles to meeting the objectives and measures. Step 5 entails identifying, analyzing, and prioritizing obstacles to closing gaps between current levels of asset performance and the objectives, measures, and end-stage targets that are set in Step 3.

The agency's risk management framework must be applied in the risk assessment process. Subject matter experts should play a central role in assessing asset risks, including experts who plan, procure, maintain and operate assets.

Risk assessments set the stage for developing well informed strategies in Step 5.

Identifying risks

Risks are identified with particular attention given to the most critical assets. All key obstacles and opportunities to meeting the performance objectives and measures should be identified and defined by answering two basic questions:

1. What can happen (e.g., equipment failure or capacity shortfall)?
2. How can it happen (i.e., the event or circumstance that led to the failure or shortfall, the causes of what happened)?

Asset risks typically include:

- Risk of equipment or facility failure;
- Risk of capacity inadequacy;
- Risk of equipment or software obsolescence;
- Risk of environmental damage or noncompliance;
- Risk of security breach or noncompliance; and
- Risk of health issue or safety mishap (injury).

Analyzing risks

Once identified and defined, the likelihood and consequences of risks to meeting the asset performance objectives are analyzed. The analysis is driven by subject matter expert judgment and such factual information as:

- Condition assessments, or if condition assessment information is unavailable, asset age;
- Historical failure trends;
- Asset utilization history and forecasts;
  - Assessments of technological obsolescence/opportunities;
  - Load forecasts and congestion/congestion cost studies; and
  - Asset criticality.

Normally, the greatest consequences should be assigned to assets that have been designated to be the most critical (Step 2). Typically, the results from this analysis are mapped such as in this sample.

Likelihood	Insignificant	Minor	Moderate	Major	Extreme	Condition Index	
Almost Certain	7	12	17	21	25	0 to 0.9	Poor
						1 to 1.9	
Likely	5	10	15	20	24	2 to 2.9	
						3 to 3.9	Marginal
Possible	3	8	13	18	23	4 to 4.9	
						5 to 5.9	
Unlikely	2	6	11	16	22	6 to 6.9	Fair
						7 to 7.9	
Rare	1	4	9	14	19	8 to 8.9	Good
						9 to 10	

Consequence

Risk Level	Low: 1 - 8	Medium: 9 - 12	Medium-High: 14 - 19	High: 20 - 25

Evaluating risks

Once the likelihood and consequences of risks have been determined, the risks are then prioritized. A consistent framework for prioritizing risks should be used across the asset category; often, trade-offs and iterations are needed to reach an integrated set of priority risks for the asset category as a whole. The basis for the prioritization must be documented.

Step 6 -- Prepare strategies. In this step, strategies are developed to close the gap between end-stage performance targets and current asset performance levels.

To be successful, strategies should establish a clear line-of-sight between (1) asset performance objectives, (2) priority gaps to be closed between objectives and current performance levels, (3) priority risks to be managed, and (4) investment, maintenance and other actions to close the gaps. Strategies must:

- Assign priority to the most critical assets that are at greatest risk of operating failure, capacity inadequacy, environmental damage or noncompliance, security breach or noncompliance, health and safety issues, or obsolescence. Example factors for determining the criticality of assets are included at Appendix A;
- Cover all four phases of asset life (create/acquire (investment), operate, maintain, and renew/dispose), with particular focus given to the investment and maintenance phases;
- Cover a 10-year planning horizon at minimum. A 7-year planning horizon for information technology assets is acceptable due to the shorter lives of these assets;
- Be driven by long-term, results-oriented performance objectives for assets and by assessments of risk to meeting the objectives. Asset performance objectives must be aligned with the agency's strategic objectives and with the long-term outcomes;
- Identify and evaluate alternative approaches to meeting the asset performance objectives, with justifications provided for the selection of preferred approaches. The preferred approach should normally be the lowest life cycle cost solution among alternatives that are viable. "Viable" is defined as operationally sound and achievable in terms of meeting the reliability, availability, adequacy or other asset performance objectives that have been set;
- Take into account staffing, supply chain, and other constraints on strategy delivery; and
- Apply the agency's common planning assumptions, such as inflation rate, market price forecast, and load forecast assumptions.

In addition, strategies should state, or make reference to, the principal methods to be followed in developing and executing asset plans. For example, a strategy would include:

- The method for determining the life cycle cost of assets;
- The method for determining whether to repair or replace an asset; and
- The process and method for prioritizing and selecting capital projects.

Finally, strategies should be:

- Durable and adaptable to changing circumstances and new information over time;
- Documented sufficiently to drive the development of planning levels (Step 6) and the development and execution of asset management plans; and
- Well articulated, so that knowledgeable stakeholders can readily understand.

Step 7 -- Forecast planning levels. The final step entails forecasting capital and expense requirements in dollars necessary to carry out the strategies developed in Step 6.

In this step, asset categories must draw a clear, compelling line of sight between the investment, maintenance and other actions called for in the strategies and the forecast of the cost requirements, which are known as planning levels. The nexus between strategies and planning levels is what justifies a spending proposal. For example, the planning levels should demonstrate that the critical assets that carry the greatest risk of failure or the greatest risk of capacity inadequacy will be given priority attention.

Planning levels must be developed with greater granularity for near-term years through the end of the next rate period. Annual capital expenditures should be estimated by capital project[3] if the project's total direct capital cost is $7 million or more. The planning levels must reflect the agency's common planning assumptions, with any exceptions documented.

The planning levels should include an expected value forecast (i.e., ~50 percent probability) for the full planning horizon and a reasonable high and low range (e.g., 80 percent and 20 percent probabilities) of potential annual costs for years through the end of the next rate period. The high and low range of annual costs should consider, for example:

- Project schedule uncertainties;
- Commodity price uncertainties;
- Technology price uncertainties;
- Supply chain constraints;
- Resource constraints and resource cost uncertainties; and
- Available outage time uncertainties.

Key assumptions must be documented, including contingency assumptions.

The expected value planning levels that are developed in this step are submitted through the internal multi-year budget process, the external stakeholder review process (Integrated Program Review), and the Federal budget process. If significant changes are made to the planning levels during these review processes, conforming changes should then be made to the strategies. The planning levels are subject to further update and adjustment prior to, and even during, the year in which actual spending occurs.

Establish an improvement plan going forward. The requirements in this policy likely cannot be met in full without a sustained, continuous improvement effort over time. An asset category's strategy document should recognize any shortcomings, and be accompanied by an improvement plan. The improvement plan should include objectives, priority actions, and key milestones for process improvements.

[3] Includes capital programs as well as capital projects.

Appendix B
Sample Documentation
Asset Performance Measure and End-stage Target

BPA Transmission Reliability (Lines)

Measure: Outage frequency (SAIFI) and duration (SAIDI) for transmission lines, by line importance rank, do not exceed control chart violation limits.

Background: Maintaining system reliability is a critical BPA responsibility. Reliability measures are monitored to help minimize both the frequency and duration of automatic (unplanned) line outages on the BPA system. SAIFI and SAIDI data are used in developing Transmission's asset management strategies and plans, and in its capital and expense planning levels.

Methodology: Reliability assessment is based on IEEE-standard measures of outage frequency (SAIFI) and duration (SAIDI). Control chart techniques, closely mirroring transmission reliability methodology adopted by the California Independent System Operator (ISO), are used to establish allowable performance levels for each line importance category (1-4). Control charts are statistically-based graphs which illustrate the natural range of variability in performance, based on the most recent 10 years of historical data (FY 1998 - FY 2007). In general, the Control Limit is calculated as the 3-standard deviation band, and the Warning Limit as the 2-standard deviation band, based on historical line performance. Actual SAIFI and SAIDI results from the past year are then compared to the control chart limits to gauge the adequacy of system reliability.

End-stage target: No control chart violations for line importance categories 1 & 2, and not more than one violation per year for line importance categories 3 & 4. Control chart violations are defined as follows:

- Latest FY above the Upper Control Limit (short-term degradation)
- 2 of last 3 FYs above the Upper Warning Limit (mid-term degradation)
- Continuous worsening trend in the last six FYs (long-term degradation)

Inclusions/ exclusions:

- Reliability monitoring is based on automatic (unplanned) outages to transmission lines (not points-of-delivery)
- Duration of any single outage is capped at 4,320 minutes (72 hours)
- Momentary outages are excluded
- Outages to lines with all or part non-federal ownership are excluded
- Outages in the year in which a line may have been energized or retired are excluded (i.e., line must have "full year" availability)
- Outages with a cause attributed to a foreign utility are excluded

Measure owner: Transmission Technical Operations (TOT)

665.0 PURPOSE

This chapter establishes the responsibilities, process requirements and evaluation criteria for (1) proposing, evaluating, and approving capital projects, (2) setting project implementation targets and reporting on variances during a project's construction phase, and (3) evaluating projects after they have been placed in service.

665.1 DEFINITIONS

A. Assets: Plant, machinery, equipment, property, buildings, structures, vehicles, servers, software applications and other items or related systems that have a distinct and quantifiable business function to BPA and its Federal Columbia River Power System (FCRPS) partners with a useful life expectancy greater than one year.

B. Asset Category: BPA has defined seven asset categories: Transmission, Federal Hydro, Facilities, Information Technology (IT), Energy Northwest's Columbia Generating Station, Energy Efficiency, and Environment, Fish & Wildlife. Asset categories are led by Category Asset Managers. This term is also used to refer to business units responsible for managing a set of assets.

C. Asset Plan: Asset plans document the condition and capability of assets, predict the demands that will be placed on assets, assess and prioritize risks to meeting long-term outcomes, and recommend investment and risk management actions to be taken over a near and long-term (e.g., 10-year) planning horizon. Asset plans are intended to be "living documents" that are updated as conditions change.

D. Business Case: A written proposal for a capital project that demonstrates a business need for investment, determines the project's financial and nonfinancial costs and benefits, assesses risks, evaluates alternatives, establishes project targets and otherwise justifies the capital project.

E. Capital Cost: For purposes of this chapter, capital cost is defined as a project's direct capital expenditures plus indirect or overhead costs attributable to the project that the asset category incurs. Corporate overheads and AFUDC are not included in this definition. Capital cost encompasses costs for the project as a whole, i.e. capital expenditures from project inception through placement in service. Only costs properly capitalized under BPA's capitalization policy are included.

F. Capital Project: An undertaking representing an investment in time and resources with a specified plan and budget, generally in a specific location, over a discrete period of time, intended to achieve a BPA long-term outcome for assets. Projects are scoped so that they are (1) clearly aligned with business objectives and targets and (2) operationally sound as an asset or set of assets. Depending on the nature of a project, it may consist of one or more work orders. For purposes of this chapter, the term capital project includes capital replacement programs, such as Transmission's wood pole replacement and access road programs, and the energy efficiency capital acquisition program.

665.2 POLICY

A. This policy applies to capital projects in these asset categories:

1. Transmission investment in assets owned or leased by BPA, whether funded by bonds issued to the U.S. Treasury, BPA financial reserves, third party sources (e.g., Northwest Infrastructure Financing Corporation (NIFC)), appropriations, or customer advances (projects funded in advance),
2. Federal hydro investment allocable to power, including capacity additions, replacements, and efficiency improvements,
3. BPA facilities investment, and
4. BPA IT equipment and software application investment.

At the Capital Allocation Board's (CAB) discretion, capital projects in the Energy Efficiency, Fish & Wildlife, and Columbia Generating Station asset categories may be added to the coverage of this policy.

This policy does not apply to reimbursable projects, in which case another utility or entity owns the asset and that entity contracts with BPA to perform construction and other services with full reimbursement to BPA for its costs.

B. Capital projects must be directed at meeting reliability standards, adequacy guidelines, availability requirements, business operations needs, or other long-term outcomes that have been established for each asset category in the agency's Asset Management Strategy and documented in asset plans. To be authorized, capital projects must be consistent with the investment needs, strategies, and priorities that are established in asset plans.

C. When more than one viable project alternative exists, the least cycle cost alternative should normally be selected. A higher cost alternative may be selected if risks and nonfinancial factors mean that reliability, adequacy, availability, or other long-term outcomes would be better served.

D. Capital projects must be evaluated, authorized, and tracked for implementation in an effective and efficient manner that:

1. Meets the agency's strategic objectives for standardized systems and processes, robust and reasonably balanced internal controls, integrated and risk-informed decision making, and transparent processes, decision making and performance,
2. Ensures due diligence and satisfies the agency's decision framework. Capital project costs, benefits and risks must be fully understood by those who authorize the projects,
3. Assigns project implementation targets, and monitors and manages projects to deliver on the targets, and
4. Meets the agency's standards of conduct and satisfies OMB Circular A-123 requirements for internal controls.

E. The business case is the approved vehicle for proposing, evaluating, and authorizing capital projects. Business cases must demonstrate a business need for investment; assess financial and nonfinancial implications and risks; evaluate alternatives; propose project implementation targets; and otherwise justify the capital project.

665.3 RESPONSIBILITIES

Key roles and responsibilities for implementing the capital project authorization process follow:

A. Agency Asset Manager (AAM)

The Agency Asset Manager leads the development and monitors implementation of agency-level asset strategies, processes, and policies. The AAM advises the Category Asset Managers on developing asset plans and evaluates plan implementation. In addition, the AAM recommends improvements to the capital project authorization process to the Chief Financial Officer (CFO), and chairs the Asset Management Council and the Agency Capital Project Review Team.

B. Asset Management Council (AMC)

The AMC develops, recommends and monitors asset management strategies, policies and processes; ensures that practices in the business units reflect sound asset management, risk management and financial principles, promotes the capital authorization policy, and promotes adherence to the agency's standards of conduct. The AMC is comprised of the Category Asset Managers, Chief Risk Officer designee, CFO designee, and the AAM.

C. Agency Capital Project Review Team (ACPRT)

The ACPRT works under the direction of the Capital Allocation Board (CAB) to review the business merits of the agency's large or strategically sensitive capital projects. Upon review, the ACPRT either approves the project or remands the proposal back to the asset category for reconsideration. If a project approved by the ACPRT meets the agency's threshold for CAB review, the capital project is elevated to the CAB for final authorization. The ACPRT works with the asset categories to ensure that appropriate analytical rigor is brought to the project authorization process, and monitors project implementation. The ACPRT is chartered and comprised of senior staff from Finance, Enterprise Risk Management, and Agency Asset Management. Upon authorization of a project, Finance works with the project sponsor if necessary to determine the preferred financing approach.

D. Capital Allocation Board (CAB)

All capital decisions, regardless of source of funding, related to budgeting and allocations are within the scope of the CAB, although some elements may be delegated to other decision-making forums. In addition, the CAB serves as the final level of review and authorization for capital projects that are large or strategically sensitive, or that meet other criteria set forth by the CAB. The CAB is responsible for records management of both the business case and project requirements documentation. In addition, the CAB may prescribe corrective actions if previously authorized projects encounter unforeseen difficulties or opportunities, including project expansion, redirection, or termination actions. The CAB is chartered and comprised of the Administrator, Deputy Administrator, Chief Operating Officer, the CFO, the Chief Risk Officer, and the Corporate Strategy Officer.

E. Category Asset Managers

Category Asset Managers develop and implement asset management strategies, plans, processes and policies for their asset categories. With regards to this chapter, Category Asset Managers promote the effective and efficient implementation of the capital project authorization policy; ensure that the asset category's capital project review team is chartered and operating efficiently and effectively; ensure that

business cases are properly developed, evaluated and approved in the business unit; ensure controls are in place so that capital projects are implemented on target and that variances are reported promptly; and ensure that post investment reviews are completed consistent with this chapter.

F. Project Sponsors

Project sponsors are the person or persons responsible for developing and justifying capital project proposals, obtaining necessary approvals for capital projects, and evaluating and reporting variances from approved targets during the course of the project. A project sponsor is typically the project's manager.

665.4 PROCEDURES

A. Process Responsibilities

1. Category Asset Managers are charged with developing and maintaining the process by which capital projects in their categories are proposed, evaluated, authorized, and tracked for implementation. The process must be consistent with this chapter.

   In addition, Category Asset Managers are responsible for establishing a capital review team that is authorized to review and approve capital projects in the asset category. The capital review team must be chartered, with the charter reviewed by the ACPRT.

2. Project sponsors must be assigned to each capital project.

3. The CAB is authorized to modify the business case and project authorization requirements in Appendix A. Modifications to Appendix A are treated as administrative updates and do not require this Chapter to be re-issued.

4. The AAM is responsible for informing internal stakeholders promptly after a CAB decision that modifies Appendix A, normally within 5 business days. The AAM is also is responsible for evaluating the effectiveness and policy conformance of asset category processes, and for developing and maintaining the process by which projects are reviewed and authorized at the agency level.

B. Business Case Requirements

1. Capital projects must be justified using the agency's standardized business case format. The ACPRT is responsible for maintaining the standardized format and for providing training on its use. The ACPRT shall ensure that the format meets the purpose and requirements of the agency's decision framework (BPA Manual Chapter 21.5). Asset Categories may propose an alternative to the agency standardized format, however, any such alternative must meet 1) the agency's decision framework and 2) the financial analysis and risk assessment requirements in the standardized format. Alternative formats must be approved by the ACPRT before use.

2. A business case must demonstrate that the capital project is consistent with the investment needs, strategies, and priorities in the asset category's asset plan.

3. Business cases must identify the key assumptions that are used to justify the project. Business cases must employ the agency's common planning assumptions when they are applicable to a

project. Common planning assumptions include economic or financial assumptions, such as load forecast, market price forecast, inflation forecast, and discount rate assumptions. (Engineering planning assumptions are not included.) The AAM is responsible for maintaining an intranet site for ready access to common planning assumptions.

4. Project costs and benefits should be quantified when feasible. Business cases must include an assessment of a project's life cycle costs and benefits. Life cycle costs are to be measured in terms of cash expenditures or savings that would accrue from the investment on a mean probable or expected basis. For new capital projects, life cycle cash expenditures often include capital costs, corporate overheads, Allowance for Funds Used During Construction (AFUDC), annual operating and maintenance (O&M) expenses after the asset is placed in service, future refurbishment costs, avoided annual O&M or capital costs (savings), revenue impacts, and end-of-life disposal costs and revenues (e.g., decommissioning, salvage, proceeds from a sale transfer).

   Life cycle costs and benefits must encompass not only the impact on the business unit that sponsors the project, but also the impact on the agency and the interconnected power and transmission system when applicable.

5. When more than one viable project alternative exists, the project alternative with the least life cycle cost should be selected. A project alternative is deemed to be viable if it is technically sound from a design and operational perspective. The determination of least life cycle cost should be made on the basis of the financial metrics in Appendix A to this chapter. A higher cost alternative may be selected if the assessment of risks or nonfinancial factors in the business case demonstrates that reliability, adequacy, availability, or other long-term outcomes would be better served.

6. For projects requiring agency-level authorization, the financial metrics specified in Appendix A should be applied to all technically viable alternatives before selecting a preferred and next best alternative.

C. Project Authorizations

1. Projects should normally be proposed and authorized on a total project basis, including projects that span more than one fiscal year. In the case of ongoing capital programs, such as the wood pole replacement and access road programs, and the energy efficiency capital acquisition, the program should normally be authorized for a period that extends through the next rate period.

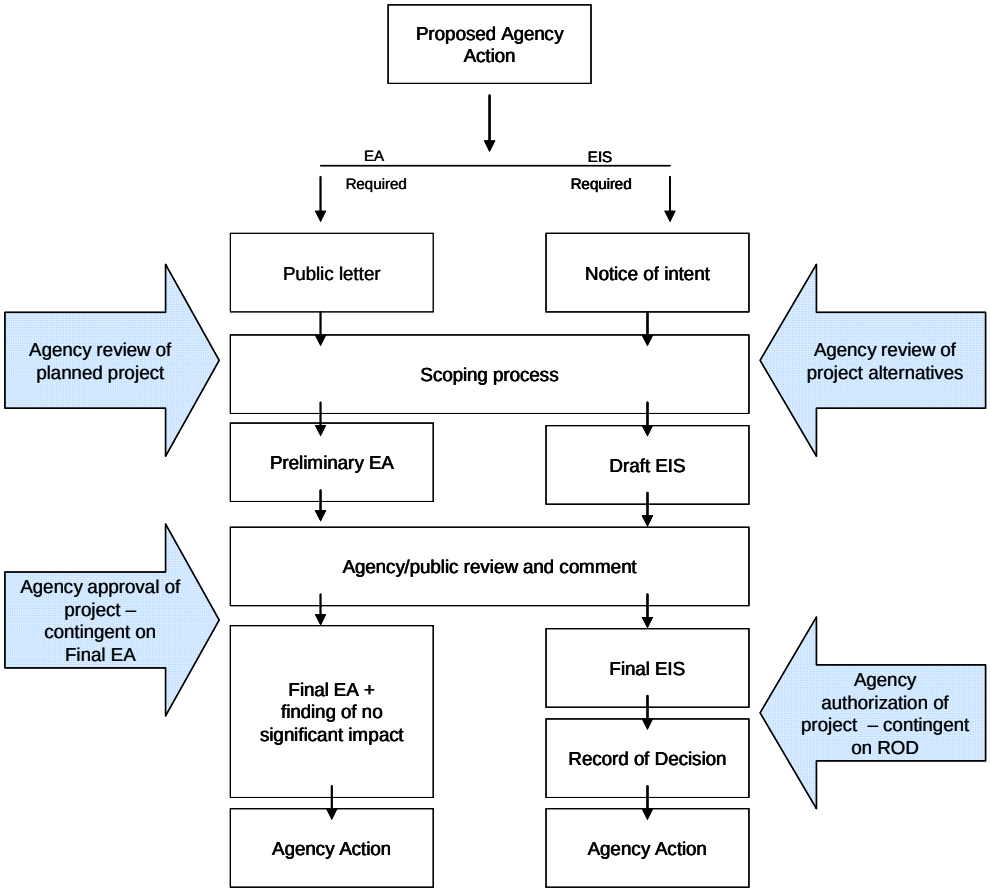
2. Capital projects must be authorized before funding is made available and capital expenditures for a project occur. An exception is made for emergency or urgent capital spending needs (see below). The Chief Financial Officer may authorize other exceptions.

3. All capital projects must be authorized by a business unit Vice President or delegate.

4. Additional levels of authorization are required by the asset category's capital review team and by the ACPRT and CAB, depending on the capital cost of the project, as specified in Appendix A. In addition, projects, regardless of capital cost, that the Category Asset Manager deems to be strategically sensitive or technologically unique, or that have significant agency-wide implications, must be submitted to the ACPRT for approval. The ACPRT, in consultation with the Category Asset Manager, will determine if such projects should be advanced to the CAB for final authorization.

5. If a project is subject to an environmental review that requires an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act (NEPA), and the project's capital cost meets the threshold for agency-level authorization in Appendix A, the agency-level process will typically include two steps. The first step entails a review of project alternatives by the ACPRT and CAB at the front-end of the scoping phase, as depicted below. This review will identify and evaluate on a preliminary basis the business implications of the project alternatives, including financial, nonfinancial, and risk implications of the alternatives. In the first step, direction may be given on the scope and evaluation of alternatives to ensure business impacts are considered as the NEPA process proceeds. The second step entails preparing a business case and reviewing and authorizing the project consistent with item 4 above. Such authorizations will be contingent on the agency's decision in the EA or EIS; contingent authorizations will not commit BPA to implement the preferred alternative project. After the EA or EIS process is completed, the asset category will notify the ACPRT if the agency's final action is significantly different than was anticipated when the project was authorized.

NEPA Environmental Review Process



6. For stage-gate projects that require agency-level authorization but do not entail an EA or EIS process, the project business case is prepared and submitted for agency authorization once the project has been scoped and defined.
7. If a capital project would cause the business unit to exceed its start of year (SOY) budget, the business unit must first obtain approval of the budget increase from Finance and the CAB before the project is authorized. Among other purposes, this requirement helps to ensure conformance with federal budget rules.
8. Asset categories are authorized to approve replacements in kind in emergency or urgent situations without submitting a business case for agency-level authorization in advance of expending capital. Emergency or urgent situations are caused by severe weather, sudden equipment failure, or other unforeseen events for which investment must be made without delay in order to:

   a. restore load service,

   b. avoid imminent unplanned outage or curtailment,

   c. mitigate environmental emergency, or

   d. mitigate safety or security emergency, or avoid significant financial loss to the agency.

   In such situations, an abbreviated business case should be prepared and submitted as soon as feasible. The abbreviated business case must include a description of the project, an explanation of the emergency or urgent situation, an assessment of the project's financial costs and benefits, and project implementation targets and thresholds. The abbreviated business case should be submitted to Finance, at which time Finance will address the allocation of funds.

D. Project Implementation Targets for project cost**,** schedule and scope/capability must be adopted as part of a project's authorization. Project implementation targets must be specific, measurable, attainable, relevant, and time definite (SMART), and they must be consistent with the project's business case. For larger or strategically sensitive projects, thresholds for reporting variances from the cost, schedule and scope/capability targets must also be set. Requirements for project implementation targets and thresholds are explained below and in Appendix A.

1. Capital cost targets and thresholds. Capital cost targets are set for the capital project as a whole. For projects that require ACPRT or CAB authorization, capital cost targets are generally specified for total project end costs but may include interim targets if warranted. Thresholds for reporting variances are typically set as a dollar amount above and below the target.
2. Schedule targets and thresholds. Schedule targets are set for the project as whole, and they include an estimated completion, energization, or in-service date. For projects that require ACPRT or CAB authorization, schedule targets are generally specified for final project completion date but may include interim targets if warranted. Examples of milestones include contract award, design completion, construction start, or project closeout. Thresholds for reporting schedule variances must also be set, typically as a fixed date after the target date(s).
3. Project scope/capability targets and thresholds. Project scope/capability targets include a short statement of the project's scope, capability or intended output. For projects that require ACPRT or

CAB authorization, thresholds for reporting variances may also be set. Typically the project is expected to deliver the project's scope, capability, or output described in the business case but a performance threshold may be appropriated in limited circumstances.

E. Project Implementation Tracking is the responsibility of project sponsors. This includes monitoring a project's progress in meeting the project implementation targets and for reporting variances to the asset category's capital review team and, originally authorized at the agency level, the ACPRT. Investment review team(s) may make projects subject to reauthorization or to corrective actions if large variances occur.

Forecasts of project schedule and cost should be updated on a quarterly basis. Variance reports should be submitted generally within one month of exceeding the threshold, and they should contain:

1. The cost, schedule or scope/capability variance,
2. Cause(s) for the variance,
3. Recommended actions, and
4. Revised forecasts with respect to project cost, schedule and scope/capability targets.

F. Post Investment Reviews of capital projects after they are placed in service will be performed. Projects are selected and reviews conducted on a schedule established jointly by the Category Asset Managers and the AAM. Post investment reviews shall include:

1. An assessment of whether objectives, costs and benefits projected at the time the project was authorized were actually delivered,
2. An assessment of causes for large variances, if any,
3. Lessons learned for delivering future capital projects, and
4. Action plan for lessons learned on future projects.

Once completed, post investment reviews will be submitted to the asset category's capital review team and the ACPRT.

665.5 REFERENCES

A. Asset Management Strategy, September 30, 2007

B. Asset Management EPIP, January 17, 2006

C. Capital Allocation Board (CAB) Charter, October 25, 2007

D. Agency Capital Project Review Team (ACPRT) Charter, May 28, 2008

E. Publicly Available Specifications PAS 55-1 & PASS 55-2, April 30, 2004

F. OMB Circular A-123, December 21, 2004

G. OMB Circular A-11, July 2007

Appendix A

Business case requirements and project authorizations

This table includes minimum requirements; asset categories may request additional analysis for internal decision making

Projects with capital cost of:	Evaluate Alternatives	Financial Metrics*		Risk Assessment	Project Implementation Targets and Thresholds for Reporting Variances	Authorizations		
		With Revenue Credit / Savings	Without Revenue Credit / Savings			Asset Category Capital Review Team	ACPRT	CAB
< $500K	Analysis required of preferred alternative only	NPV, NCR	PV	No risk assessment required	Targets for project schedule, cost, and scope/capability. No thresholds	Asset Category VP only	No	No
$500K - $3M	Analysis of the preferred and do nothing / status quo alternatives are included in business case	NPV, NCR	PV	Do nothing / status quo alternative	Targets for project schedule, cost, and scope/capability. Thresholds for cost and schedule only	Yes	No	No
$3M - $7M	Analysis of preferred, do nothing /status quo, and next best alternatives are included in business case	NPV, NCR	PV	Do nothing / status quo, preferred, and next best alternatives. Also, assessment of risks to meeting project implementation targets	Targets and thresholds for project schedule, cost and scope/capability required prior to agency level approval	Yes	Yes	No
> $7M	Analysis of preferred, do nothing /status quo, and next best alternatives are included in business case	NPV, NCR, PVRR*	PV, PVRR*	Do nothing / status quo, preferred, and next best alternatives. Also, assessment of risks to meeting project implementation targets	Targets and thresholds for schedule, cost and scope/capability required prior to agency level approval	Yes	Yes	Yes
		Sensitivity analysis if key cost / benefit drivers are highly uncertain						
Projects, regardless of cost, that are strategically important or technologically unique or that have significant agency implications --- Projects that are not represented in an approved Asset Plan or SOY budget	Analysis of alternatives commensurate with the project's capital cost (see above)					Yes	Yes	Yes (as determined by the ACPRT)

* Necessity of this metric is determined by Finance on a case-by-case basis