

2008 Integrated Program Review  
PPC List of Issues For Discussion with BPA- 24 July 2008  
Questions & Answers based on BPA Transmission Services' 2008 Asset Plan  
(Working Draft - July 2008)  
Responses Drafted by Transmission - 29 July 2008

**Question #1-** Section 2.6 - Summary of Critical Facilities (p. 9)  
Please provide a summary of the test for criticality of facilities that BPA is currently developing. Please provide a copy of OB-19.

***Response:** BPA can not provide a copy of OB-19 and the priority pathways because of the critical and sensitive information they contain. BPA applies the U.S. DOE Official Use Only guidelines.*

**Question #2-** Section 2.7 - System-level Metrics and Targets, WECC Maintenance (p. 9-10). Please list and explain the "WECC approved or revised mitigation plan milestones. . . ."

***Response:** We have filed 19 mitigation plans. They are generally in the areas of emergency operations planning, capacity and energy emergencies, system restoration plans, automatic generation control, cyber security, vegetation, etc. All mitigation plans are on schedule to meet technical and documentation milestones; we will submit completion of 8 of the plans by August 15th. In accordance with NERC/FERC procedures, the plans are confidential until the process has been closed out. We will continue to share specific information with our neighboring utilities on matters that impact them, e.g. UVLS, UFLS, etc. We encourage customers to participate in the WECC Compliance Users Group to get up-to-date information on what's going on the compliance arena.*

**Question #3-** Section 3.1.2 - Key Drivers (Expansion), Interconnection of New Generation (p. 11), What is the "Wholesale Transmission Service (WTS) . . . tariff[ ]"? Please explain why, other than the OATT, that Transmission Services has "no control over the timing or location of IPP's interconnections?"

***Response:** Wholesale Transmission Service (WTS) is the transmission of electric energy sold, or to be sold, in the wholesale electric power market. Transmission Services (and BPA as a whole) has no control over the timing or location of IPP's interconnections because the developers' plans are market-driven. The IPP's develop plants where and when it is profitable to market the power output, and that is driven by the market which is totally outside of BPA's control. In addition, there are external mandates such as requirements for renewable resource portfolios which drive some of the development. Also, the plants locate where the resources are - whether that is wind or natural gas supply. These factors are all outside of BPA's control.*

**Question #4-** Section 3.1.3 - Expansion Portfolio, Main Grid (p. 14)  
What facilities are included in the Main Grid? Is this defined by OB-19?

**Response:** *Main Grid - These are our expansion projects. The transmission lines and related substations that carry bulk power within the Northwest. The main grid provides the primary connections among major load areas, large generating plants, major interties, and some intermediate load areas. It can be at any voltage 69-500kV. The main grid includes all 500-kV and 345-kV lines, and those lower voltage lines that perform the main grid function, other than interties. Those portions of substations, including transformers, supporting the main grid lines are also included. Most of the Main Grid facilities are included in OB-19.*

**Question #5-** On-Going Projects - NERC Criteria Compliance (p. 28-29)  
This subsection describes what appears to be a placeholder for future projects. Are there any projects in this category? In the "Asset Plan Budget Estimates 2008-2017," p. 2, posted in 2008 IPR you forecast \$9 million for this category for each of FY 10 and 11. How was that budget amount determined?

**Response:** *It is a placeholder category for projects resulting from the annual system studies to comply with the mandatory NERC Reliability Standards. The types of projects in this category include line upgrades, bus sectionalizing breaker additions, shunt capacitor additions, Relay protection and more specifically Under-frequency Relays and Control Systems, etc. These projects are on-going because the NERC compliance screening to identify them, happens on an on-going, annual basis. The forecast amount is an estimate based on the types of projects that we anticipate resulting from the Compliance screening. Because the standards have only recently been made mandatory, this amount will be adjusted as we gain experience about the scope of projects that are required to meet the standards.*

**Question #6-** Please provide the above information for the following categories:

- Main Grid Reactive Facilities (p. 29)
- Line Relocations on Tribal Lands (p. 29-30)
- Main Grid Facility Additions (p. 30)
- Other Associated Interconnection Facilities (p. 30-31)
- Network Open Season Additions (p. 31-32)

**Response:**

- *Main Grid Reactive Facilities*

*This is a placeholder category for reactive additions required to support voltage schedules system wide. This could include shunt capacitors or reactors or static VAR compensators (SVC's). The key drivers for these types of projects are typically load growth and the requirements to meet mandatory*

*reliability standards. The budget amount for this category is an estimate based on anticipated facility needs and typical cost estimates for those types of facilities.*

- *Line Relocations on Tribal Lands*

*BPA has a number of facilities which cross tribal lands. As BPA's rights to cross these lands expire, they must either be re-negotiated or the lines must be physically re-located. This is a placeholder category which covers the funds needed to rebuild the lines off of the tribal lands if new rights cannot be negotiated. The key drivers for these projects are the expiring agreements with the tribes for right-of-way access. The budget amount for this category is an estimate based on past experience with mitigation for expiring right-of-way access.*

- *Main Grid Facility Additions*

*This is a general placeholder category for grid expansion projects required to support load growth or other contractual obligations or criteria. This category may include projects such as line taps, substation bay additions, redundant transfer trip, or remedial action schemes. The key drivers for these types of projects are contractual obligations, load service requirements and compliance with mandatory reliability standards. The budget amount for this category is an estimate based on anticipated facility needs and typical cost estimates for those types of facilities.*

- *Other Associated Interconnection Facilities*

*This is a general placeholder category for grid expansion projects required to interconnect new resources, or customer lines or loads, into the transmission system, as required by BPA's Open Access Transmission Tariff (OATT). This category may include projects such as line upgrades, new lines, new substations or substation equipment, transmission line switchgear, protective relaying modifications/additions, control and communications additions, etc. The key driver for these types of projects is BPA's obligation to provide open access to transmission for either generation or line/load interconnection requests. The budget amount for this category is an estimate based on anticipated facility needs and typical cost estimates for those types of facilities.*

- *Network Open Season Additions*

*This is a general placeholder category for grid expansion projects required to support BPA's Network Open Season process and accommodate long term firm transmission service contracts. This category may include projects such as line upgrades, new transmission lines, new substations, series compensation, etc. The key drivers for these types of projects are the precedent transmission service agreements which obligate BPA to provide firm transmission service to the entities which sign the agreements. The budget amount for this category*

*is an estimate based on anticipated facility needs and typical cost estimates for those types of facilities.*

**Question #7-** On page 2 of the "Asset Plan Budget Estimates 2008-2017, please provide the above explanations for the line item "Various Additions."

**Response:** *Various Additions is a placeholder category for projects not yet identified which don't fall into any of the above categories. The key drivers are primarily load service and system reliability. The budget amount for this category is an estimate based on anticipated facility needs and typical cost estimates for those types of facilities.*

**Question #8-** Section 3.2.1.5 – Overhead Asset: Recommendations and Future State (p. 47-48). Please describe in some detail the "four additional efforts to bring the overall asset health into a Good ranking." (p. 48)

**Response:** *Please see separate Powerpoint presentation titled Proactive OHL Asset Management.*

**Question #9-** Section 3.2.2.5 – Substation Asset: Investment Recommendations, Wire-Wound Equipment Replacement (p. 71-72)  
In what years will the Tertiary Ground Protection Schemes be replaced?

**Response:** *The addition of these schemes has been an ongoing program with expected completion in the 2011 to 2012 timeframe. No new installations are scheduled for 2009 due to continuation of 2008 projects. In 2010 the next group of additions will be started with the goal of completing all schemes in 2-3 years. Accomplishing the work is heavily influenced by the ability to obtain outages. The majority of the remaining schemes are on sub grid transformers.*

**Question #10-** Capacitors (Shunt & Series) (p. 72)  
In what years with the Series capacitor control replacements take place?

**Response:** *Life expectancy for electronic protection and control circuits is roughly 20-25 years. However it is our experience that electronic equipment becomes obsolete in 5-10 years. We hope to get 20-25 years out of the equipment but manufacturers are not supporting the equipment in many cases. The 3<sup>rd</sup> AC Intertie Series controls have been in service on average for 15 years. The current plan is to budget for control replacement beginning in 2014 with specifications and preliminary design requirements established in the first year and the actual replacements taking place over a 4 year period beginning in 2015 since there are multiple sites involved. Replacement windows will be adjusted based on actual performance, i.e. component failure rates, maintenance levels, parts availability, etc.*

**Question #11-** SVCs & TCSC (p. 73), In what years will the controls replacement take place?

**Response:** *Life expectancy is similar to the Series capacitor controls and the facilities have also been in service almost 15 years. However it is our experience that electronic equipment becomes obsolete in 5-10 years. We hope to get 20-25 years out of the equipment but manufacturers are not supporting the equipment in many cases. A preliminary replacement study conducted in 2005/06 suggested the SVCs should deliver close to a 25 year life expectancy. Only two sites are involved and specification/preliminary design work would begin in 2015 with expected completion over 2-3 years with construction beginning in 2016. Replacement windows will be adjusted based on actual performance, i.e. component failure rates, maintenance levels, parts availability, etc.*

**Question #12-** Section 3.2.6.1 – Risk Assessment (for TEAP) (p. 114)  
Please explain in more detail the basis for concluding on page 115 that the risk of not doing the project is greater than the risks of doing the project.

**Response:** *Power System Control (PSC), the functional team for TEAP's communications test equipment issues and capital requests reviews and analyzes the following criteria:*

- *Stratum One Frequency Source*
- *Microwave Frequency Generators*
- *Microwave Counter/Power Meters*
- *RF Spectrum Analyzer with analysis software*

*Background:*

*The BPA communications system is composed of a combination of analog microwave and UHF radios, and digital microwave and UHF radios and fiber optics. In some locations across the system BPA and customers interface at either the RF or DS1/DS0 level. The provisioning, maintenance, and repair of microwave require the use of several types of test equipment including Spectrum Analyzers, Microwave Frequency Generators, and Microwave Counters and Power Meters. BPA is required by DOE and National Telecommunications and Information Administration (NTIA) regulation to verify annually that all radios are operating within the boundaries of the frequency licenses which require the use of adequate test equipment.*

*Specifics:*

*The Stratum One Source is required to meet WECC guidelines for interfacing DS1/DS0 circuits between operational systems with different owners. This source will be used to verify proper operation of interface circuits between BPA and customers carrying control and dispatch voice circuits. Inability to*

*properly synchronize these circuits results in bad data being passed between systems and resulting in control circuit mis-operation. This poses a stability risk to both BPA and customer systems.*

*The Frequency Generators, MW Counter/Power Meters and Spectrum Analyzers have two primary drivers. The first is to replace aging equipment that is no longer economical to calibrate and repair. The second driver is technology based. Digital radios require the use of test equipment with greater resolution and sensitivity that our older test equipment is not capable of providing. The annual maintenance requirement cannot be met without test equipment that meets the manufacturer's requirements for resolution and sensitivity. Finally, the special software options for the RF Spectrum Analyzer allow the instrument to be used to perform advanced testing and analysis functions for trouble shooting digital microwave system performance problems. By equipping the unit with this analysis software we are able to avoid purchase of additional test equipment to perform these more advanced analysis functions.*

*The risks of not doing the projects include:*

- Not purchasing the Stratum One Source means we are not able to verify whether our inter-utility timing meets WECC guidelines.*
- Not purchasing replacement microwave test equipment means we are not able to perform necessary preventative and corrective maintenance which puts hundreds of critical control circuits at risk.*

*The risk of doing the projects includes:*

- The only anticipated risk with purchasing is associated with cost increase which should be a minimal risk since work order amounts are based on previous purchases and vendor quotes.*

**Question #13-** Section 3.2.7 Maintenance Programs (p. 116-120)-

Does TS expect that the final program cost numbers for the Maintenance programs will increase for FY 10-11 due to the recent vegetation event and the recent reassessment of risks in the ROWs? If so, what is the expected magnitude of the change?

**Response:** *There is no expected change to the program levels.*

**Facilities Asset Management Plan, FY2009-FY2018 (July 3, 2008)-**

**Question #14-** In the table on p. 8, from FY2009 to FY2010, the total Facilities Expense Plan cost nearly doubles.

- Please define and provide details on “Conditions Assessment Requirements and Renewals.”

*Response: During recent condition assessments of facilities, we have identified deficiencies that need to be addressed at our facilities. Based on an industry standard approach, an estimate was calculated for the correction of each deficiency. The term used to represent deficiencies and the cost to address them is “requirement”.*

*Examples of requirements to be addressed in FY10 and 11 are:*

- *Replace failing HVAC systems*
- *Install lighted exit signs*
- *Replace aged and failing roofs*
- *Upgrade water supply systems*

*“Renewals” are defined as repairing or replacing a piece of equipment in order to bring the facility system back to like-new condition. These renewals are scheduled based on the life expectancy of the system. The facilities asset management plan includes a strategy of renewals to be performed on systems when they have reached 150% of their expected useful life unless it shows signs of failure beforehand.*

**Question #15-** How much of the increase in FY2010 and in the subsequent fiscal years is due to “Conditions Assessment Requirements and Renewals?”

*Response: The facilities asset management plan includes all “requirements” and “renewals” identified at 118 critical sites. This totals \$71M in today’s dollars. The plan sets forth a strategy to address the most critical needs in the early years of the plan, but levelizes the remainder over the 10 year period. With the exception of \$1M to address facilities seismic hardening and costs associated with the proposed new building projects, the rest of the increase of \$9.5M in FY10 is due to the results of the condition assessment project. It is approximately the same in FY11. Subsequent years show a reduced amount as critical deficiencies are addressed.*

**Question #16-** In the graph on p. 8 and on p. 9, what are the placeholders for unassessed sites, contingency and emergencies and for facility-related business resilience initiatives and how were the expense amounts determined?

*Response: The asset management plan only includes requirements identified at 118 sites. Placeholders were included in the plan to allow for results of condition assessments currently underway on facilities at the remaining 312 sites. These estimates were derived based on the results of similar age/size buildings already assessed. Since the first draft of the plan, a decision has been made to develop a full year’s work plan based on prioritized projects with no funds held for emergencies. When emergencies arise, planned projects will be re-prioritized to address them.*

A key agency target is planned in FY 09 to determine facility related needs to ensure business continuity. Several facilities are requiring seismic hardening in response to this initiative. These amounts were determined based on historical costs of seismic assessments and hardening projects of facilities.

The business resilience capital placeholders represent an approximate cost to construct or modify new/existing facilities that may be identified as part of the business resilience initiatives.

**Question #17-** How do these placeholders differ from reserves?

*Response: In the past Transmission had capital reserves for emergencies. We no longer have a separate fund for emergencies.*

**Question #18-** Did TS evaluate its ability to delay the construction of the new Dittmer office building by one or two years to mitigate the impact of the project on FY10-11 investment costs? If not, why not?

*Response: The Dittmer Annex has been delayed several times. During this time, the technical requirements and business case have been refined and updated. The business requirements for additional space have been solidified. As the project gets pushed out, construction costs continue to rise faster than inflation. We've evaluated the options to meeting the space requirements by conducting extensive build vs. lease analyses. With Transmission's long-term need, our analysis demonstrates it is most cost effective to own a facility. We have applied the same economic analysis (lifecycle cost) methodology for this facility as we do with Transmission projects. In addition to financial issues, there are regulatory requirements that drive the need for the Dittmer Annex. To abide by NERC (CIP) security requirements, BPA is going to require employees located / entering the main Dittmer building to undergo additional background checks. It is therefore likely that we are going to have to limit who is located in the building and who can enter it. The Dittmer Annex would allow flexibility to meet the NERC requirement.*

**Question #19-** In response to what current regulatory or federal initiative is BPA undertaking the security investments for which costs are projected on page 10?

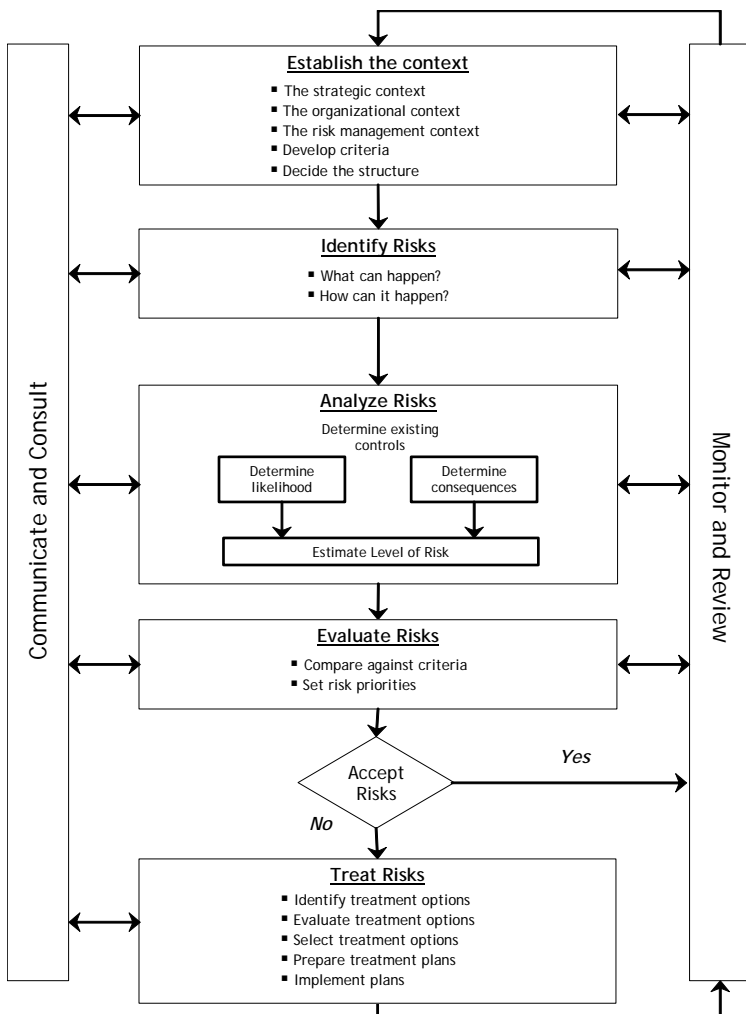
*Response: The federal/regulatory standards set forth under NERC Critical Infrastructure Protection (CIP) stipulate protection requirements and criteria pertaining to critical cyber assets (CCA), as well as enhanced risk assessment requirements for personnel having access to CCA. As a result of these requirements from NERC, it is necessary for BPA to conduct additional risk assessments of our facilities and assets, develop methodologies for protecting items identified under NERC CIP, and finally, implement upgraded physical*



security enhancements for CCA. The additional demands on resources required by the standards coupled with the increased cost of implementing additional physical security standards results in additional costs as identified on page 10.

**Question #20-** Please provide a more detailed description of the method used to evaluate risks set forth on page 11.

**Response:** Risk analysis is conducted at the program level as well as at the project level. At the program level, the Facilities Asset Management team works with BPA's Chief Risk Office staff to evaluate risks using the Australian/New Zealand Standard risk assessment methodology. See diagram below.



The risks will be identified and evaluated during regular team meetings with a cross-agency functional team tasked with reviewing and recommending the facilities asset management plan.

*Additionally, at the project level, risks are identified and detailed for “doing” and “not doing” the project. There are specific questions that are in the required project business case-- identifying risks addressed by the project, identifying key decision criteria (legal, environmental, public interest, people & processes, and other factors), and determining project execution risks and management controls.*

### **Asset Management Plans Generally**

**Question #21-** *Overall, the Asset Management Plans do not mention the expected impact of aggregate planned investments on rate levels. Why does TS not evaluate expected rate impacts and make adjustments to program schedules of non-time-critical investments in years with larger amounts of necessary investments in order to mitigate upward rate pressures?*

**Response:** *The Transmission Asset Plan is still in draft phase. In its current state, the draft Transmission Asset Plan is the planning phase for capital investments. A more thorough business case is done of each proposed project during the capital cycle. For example, in FY08 operating year, FY09 proposed capital projects are evaluated to determine whether the project is discretionary or nondiscretionary, what the system and business needs are, risk impacts of not doing or doing the project, and a life-cycle cost analysis.*

*Due to aging infrastructure, T is in catch-up mode and our capital program is filled with time critical investments, e.g. wood pole, spacers, breaker replacement programs, etc.*

*The bulk of our projects are nondiscretionary; nondiscretionary projects include emergency replacements, mandatory replacements / upgrades/additions, and tariff generated projects. These time critical projects are defined for FY09 capital as follows:*

- *Funding needed to replace failed equipment or operational function that is critical to the reliable operation of the BPA transmission system examples: Failure of a power transformer; failure of a line protective relay; failure of station or communication batteries; major component failure of a Remedial Action Scheme; failure of a transmission line circuit; failure of a control system like SCADA.*
- *Funding for mandatory replacements / upgrades/ additions projects is to mitigate violations or resolve non-compliance or prevent non-compliance of federal law including regulatory requirements or standards, such as FERC, NERC, environmental, and OSHA. The project submittal identifies-- the statute, requirement, or standard, including*

*the specific section or clause, that applies; and why the project must start in FY09.*

- *Tariff Generated Projects: Funding for projects in response to a Transmission Service Request, Generation Interconnection Request or Line/Load Interconnection Request made pursuant to BPA's OATT (Tariff).*
  - a. *100% Customer Financed/BPA owned Projects: Funding for all customer-financed projects with executed (signed) agreement. The project submittal identifies the specific customer agreement that applies; and why the project must start in FY09*
  - b. *Network Open Season Projects: Funding for projects developed in response to the Network Open Season. The project submittal identifies the specific customer agreements that apply, the PTSA (contract) conditions have been satisfied; and why the project must start in FY09*
  - c. *NT Projects: Projects required to accommodate current NT load and forecasted NT load growth that. The project submittal identifies the specific customer agreement that applies; and why the project must start in FY09.*