

Staffing Costs Follow-up

Please provide the total full time equivalent workforce for BPA projected for FY 2017-2019 and categorized by business organization. Please also distinguish between contractor and federal employees. Please also provide this information on a historical basis for the most recently available five fiscal years.

Bonneville has included in the IPR funding for the Bonneville's Workforce Strategy Key Strategic Initiative (KSI). The objective of this KSI is to have a diverse workforce of the right size and composition, with the right skills and competencies, working in a positive work environment to deliver on its public responsibilities and strategic priorities through a federally compliant Human Capital Management program in collaboration with the Department of Energy and compliant procurement practices. Specific projects and initiatives for FY17 within the Workforce Strategy include:

- Talent Management Strategy update for FY18-20
- Workforce Study to determine the right size and composition of organizations
- Position Management and Workforce Modernization
- Compensation Initiative to ensure we can attract and retain the top talent
- Supplemental Labor Compliance
- Diversity and Inclusion Program Implementation
- Executive Succession Program

Bonneville has established a dedicated team that will begin performing a workforce planning and analysis study to determine our optimal size and composition of both FTE and supplemental labor to effectively and efficiently deliver on our mission. Our goal is to ensure strategic staffing levels that are proactively and continuously shaped based on natural patterns of attrition and demographic shifts to meet future functional, technical and compliance related changes in advance of a changing environment.

The cost estimates developed for the IPR are based on achieving overall cost targets tied to FY 2015 actual expenditures. During the review and approval process of initial IPR submissions, reductions were made to total department cost estimates to achieve these cost targets. These reductions were not specifically assigned to detailed cost categories such as federal FTE and supplemental labor. As a result, IPR forecasts of federal FTE and supplemental labor head count may not yet reflect strategic staffing decisions or be representative of management intentions. More precise personnel and contractor budgets will be informed by the Workforce Strategy KSI as IPR strategic cost estimates are translated to departmental and project management plans as part of start-of-year budgets.

The following table contains Federal Full Time Equivalent (FTE) information for FYs 2012 to 2016. FTE is a measure of the number of hours work during the year, not the number of employees or positions. The data for FY's 2012 to 2016 represent actual FTE used at the end of the year. It shows the impact of the hiring difficulties Bonneville has experienced over the past few years, with FTE levels dropping from 3,039 in FY 2012 to a low of 2,842 in FY 2015. Since that time, FTE has been slowly recovering and returning to normal levels. While the FTE levels for FYs 2017 to 2019 are still being determined, IPR cost estimates incorporate sufficient funds to

support a return to the staffing levels managers deem necessary to support Bonneville’s programs and activities.

Federal FTE	2012 EOY	2013 EOY	2014 EOY	2015 EOY	2016 EOY*	2017 IPR	2018 IPR	2019 IPR
AGENCY SERVICES	1,072	1,060	1,029	995	1,023	TBD	TBD	TBD
POWER	337	324	303	289	297	TBD	TBD	TBD
TRANS	1,630	1,616	1,563	1,558	1,568	TBD	TBD	TBD
Grand Total	3,039	3,000	2,895	2,842	2,888	TBD	TBD	TBD

*projected by Human Capital Management based on actuals as of 7/1/16.

Contract labor is managed by Bonneville separate from federal labor. Bonneville uses contract labor for a wide range of purposes – including construction, expert services consulting, outsources services and staff augmentation – also known as supplemental labor. The table below contains actual and projected head counts for supplemental labor.

Supplemental Labor Head Count	2012 EOY	2013 EOY	2014 EOY	2015 EOY	2016 EOY*	2017 IPR	2018 IPR	2019 IPR
AGENCY SERVICES	571	584	627	630	554	TBD	TBD	TBD
POWER	53	62	73	82	75	TBD	TBD	TBD
TRANS	584	653	766	806	756	TBD	TBD	TBD
Grand Total	1,208	1,299	1,466	1,518	1,385	TBD	TBD	TBD

*projected by the Supplemental Labor Management Office based on actuals as of 7/1/16.

KSI Costs Follow-ups

Please confirm the extent of the proposed projects listed or intended to be funded by the KSIs.

- a. Please provide a complete list of the projects by KSI
- b. Please confirm that the projects for which BPA has proposed to budget funds under the each of the KSIs will be completed at the end of the FY2018-19 rate period and that there are no proposed funding or expenditures in subsequent fiscal years.
- c. For each of the projects please provide the specific reason for expending money on the project in the FY 2018-19 rate period as opposed in a subsequent rate period.

Safety & Occupational Health Strategy KSI

Responses to 1a, b and c:

All of the Safety and Occupational Health KSI’s expense was redeployed from budget reductions in all other CAO organizations into proposed spending levels. There was no additional expense added to the proposed spending levels as a result of this KSI. Safety as a core value is a long-term commitment for BPA. While our safety efforts have been under the umbrella of the Safety KSI, it is part of our core work and will remain an integral part of our cost structure. Therefore, this KSI will be ongoing beyond the FY 2018-19 rate period.

The safety of BPA personnel and contractors is a top priority and efforts cannot be deferred to other rate periods. Building a strong safety culture across the BPA will ensure our workforce that we care about their health and well-being. BPA is confident that these initiatives will maximize productivity, minimize costs and ensure reliability by creating a workplace free of recognized hazards and ensuring compliance with federal regulations.

KSI Expense (\$millions)	FY17	FY18	FY19
Total	4.5	4.6	4.7
Redeployed	(4.5)	(4.6)	(4.7)
Safety & Occupational Health Incremental	0.0	0.0	0.0

Projects

The Safety team is building a solid foundation by partnering with all organizations across BPA to empower and engage employees through “Stand-up for Safety” events and trainings, and by implementing a Safety Management System with established Safety Dashboard metrics. In addition, the following are specific projects and initiatives that will ultimately become part of our everyday safety program:

- Arch Flash Consulting and Training
- Contractor Safety Monitoring
- Federal Occupational Health
- Industrial Hygienic Services
- Frontline leader safety training
- First Aid and Human Performance training
- Risk rated and prioritized exposure programs

BPA is also benchmarking its safety performance with industry peers, performing workload studies and conducting independent third-party reviews to implement a robust safety and health system. We are already seeing early returns on our safety investments, specifically through no fatalities, lower workplace injuries and increased reporting on near-hits, consistent with best-in-class programs.

Workforce Strategy KSI

Responses to 1a, b and c:

Workforce KSI’s expenses result from a more integrated and focused effort on key initiatives listed within this KSI. There was no additional expense added to the proposed spending levels as a result of this KSI. BPA’s Talent Management strategic objectives are to have a workforce that 1) is the right size and composition, 2) possesses the right skills and competencies and 3) works in a positive environment. These objectives were incorporated into the Workforce Strategy KSI and will be ongoing beyond the FY 2018-19 rate period, even if this effort is no longer a KSI.

BPA will need to perform a workforce planning and analysis study to ensure its workforce is proactively and continuously shaped based on natural patterns of attrition and demographic shifts to meet future functional, technical and compliance related changes in advance of a changing environment. Therefore, the Workforce Strategy KSI efforts cannot be deferred to other rate periods.

KSI Expense (\$millions)	FY17	FY18	FY19
Total	6.0	5.9	6.0
Redeployed	(6.0)	(5.9)	(6.0)
Workforce Incremental	0.0	0.0	0.0

Initiatives

BPA Human Capital Management’s goals are to have a diverse workforce of the right size and composition, with the right skills and competencies, working in a positive work environment to deliver on its public responsibilities and strategic priorities through a federally compliant HCM program in collaboration with the Department of Energy and compliant procurement practices. Some of specific projects and initiatives within the Workforce strategy include:

- Talent management strategy update
- Workforce study
- Workforce modernization
- Compensation initiative
- Supplemental labor compliance
- Diversity and Inclusion Program implementation
- Executive Succession program

HCM is responsible for the implementation of the Workforce Strategy KSI in addition to developing communication, coordinating HR strategies, policies and initiatives with BPA business units and corporate organizations in accordance with operational and strategic initiatives, and in compliance with all federal human resource policies.

Asset Management Strategy KSI

Response to 1a) The major sub-projects to be completed under the Asset Management Key Strategic Initiative (AM KSI) are as follows:

Strategy and Planning / Life Cycle Delivery

To improve the maturity of BPA's asset management, BPA will create Agency standards and requirements for the development of Strategic Asset Management Plans (SAMPs) and Asset Plans. The current strategies and plans will be reviewed and updated for each of the Asset Categories to ensure asset management activities and outputs from its assets align with BPA's strategic direction.

The SAMPs will describe the long-term approach to physical assets and will influence the analysis of the future demands to be placed on the asset portfolio. The Asset Plans will specify the activities that BPA intends to undertake to deliver its objectives. BPA's asset management plans will ensure effective control of the Life Cycle Delivery activities and risks to create/acquire, operate, maintain and dispose of assets.

Asset Information

In order to optimize the prioritization and benefits of capital and expense investments, BPA must have information on the age, condition and performance of the assets. BPA's asset information is currently incomplete. A sub-project of the AM KSI includes developing an Asset Information Strategy that will prescribe the governance of asset information. Resources will be allocated to assess, collect and improve asset information to ensure activities focus on areas that will provide the most benefit including the refinement of asset replacement decisions to:

- reduce unexpected failures.
- avoid unnecessary premature replacement of assets.
- diminish risk.
- improve reliability and cost savings.

Any IT systems required to support the Asset Information subproject will be executed under the Business Information System KSI.

Risk and Review

The AM KSI will refine and deliver a more robust Risk and Review methodology that will result in internal controls and audit mechanisms that assure objectives are being met and will support continuous improvements. This project will ensure that effective feedback is provided for the sustain asset strategies resulting in higher success rates in delivering benefits that were identified when the investments were approved.

Response to 1b)

BPA intends to accomplish the major objectives of the AM KSI by end of FY 19. It is anticipated that the asset management improvement efforts beyond FY 19 will be incorporated into BPA's future processes, review and feedback mechanisms that are developed and implemented as a result of the AM KSI. However, due to the magnitude and volume of asset types in BPA, the undertakings to improve asset information may require additional resources beyond FY 19.

Response to 1c)

Research has concluded that BPA has gaps in asset management practices and capabilities. BPA's aging assets and systems need significant re-investment and funds are constrained. If BPA continues to further delay investing in asset management capabilities, then it will result in greater uncertainty, higher exposure to risk and increase in costs resulting in higher rates.

Long-Term Financial & Rates Strategy KSI**Response to 1a:**

There are three closely related focus areas for the Long-Term Financial & Rates KSI (LTFR KSI) that will provide BPA a greater ability to manage costs enabling the agency to remain competitive. Those include:

- Long-term Analytical Modeling and Tools
- Cost Management
- Competitiveness

For the Long-term Analytical Modeling and Tools focus, guided by an external consultant study, the LTFR KSI will begin implementing efficiency improvements to the long-term modeling tools starting in FY 17 to enable quick and systematic analysis of capital and expense scenarios. In addition, BPA will continue to publish an updated reference case at least once each fiscal year using the latest IPR/CIR data, updated market and load forecasts, and out-year program specific escalations.

As part of the Cost Management focus area, also informed by a consultant study, the agency will perform a comprehensive analysis of BPA's cost structure and develop a project plan to further refine BPA's spending level development, budget execution and monitoring processes. Implementation of actions for the cost management initiative is expected to begin in FY 18 and continue through FY 19.

Finally, under the Competitiveness focus area of the KSI, BPA will build a framework to assess the competitive position of BPA's Power and Transmission products, services and programs. Based on this analysis, during FY 18 and FY 19, BPA will begin to develop long-term performance goals and will launch mechanisms to start tracking progress towards these goals. Work to assess BPA's competitive position and develop strategies to achieve defined performance goals will extend beyond FY19.

Response to 1b:

For the LTFR KSI, we anticipate needing funds beyond FY 19 at this time. We believe that the deliverables for the three focus areas included in the KSI will not be successfully achieved until FY 20. It is also our belief that beyond FY 20, all the associated work would become operationalized and be absorbed into the existing organizations' budgets and the KSI would not need incremental funds. The timing of when the LTFR KSI work becomes a part of baseload work may vary as we proceed with implementation. We will strive to reach our desired end state for the LTFR KSI as soon as possible but we also want to roll out the KSI in a manner that allows us to have lasting benefits, in particular from the implementation of the cost management end goals as described in the KSI.

Response to 1c:

Investments in the LTFR KSI are a time-sensitive undertaking. Any deferral in the proposed spending and associated work plans would defer BPA's ability to implement improvements that strengthen BPA's cost

management discipline, understanding of competitive positioning and analysis of long term rate impacts. Deferring the work plans funded by these proposed expenditures would continue status quo practices.

Business Information Systems KSI

Responses to 1a, b and c:

The Business Information Systems KSI (BIS KSI) is in the early planning stages to determine what work will be done in the FY 2018-2019 rate period. We are doing a deliberate analysis of our current state and future strategy to arrive at a roadmap coordinated with the other KSI efforts. At this point, we do not anticipate having specific projects identified for the FY 2018-2019 rate period until the first quarter of FY 2017. Based on our work so far, it would be reasonable to expect projects that address our Asset Management, Cost Management, Customer/Billing services and Budget/Planning/Forecasting capabilities. The work done in FY 2017-2019 will inform the roadmap and priorities going forward, so we cannot provide a finalized roster or schedule of projects at this time for future rate periods. We will provide additional information and progress reports in our Quarterly Business Reviews. For the IPR/CIR workshops, in order to support further planning and to ensure we maintained transparency on our KSI planning process, we provided cost assessments that could support the anticipated work based on prioritization.

For all of the BIS KSI projects, a primary consideration will be to ensure that we sequence our expenditures in a way that we build our foundational capabilities and enable future projects to deliver more value for the expenditures. If we put off these projects to future years, we will be forced to make tactical decisions without a strong strategic direction and will be perpetuating the kinds of issues we have found are currently making the BIS capabilities sub-optimal.

IT Capital and Expenses

Please identify where each of those costs are reflected in each budget (e.g. IT, KSIs, T, P, CAO, etc.) and whether they are the costs of software, services, internal FTEs, external FTEs or consultants, overheads, etc., and whether each cost is capitalized or expensed.

Please provide a workshop to review the above information and discuss the issues raised by it. Overall, the presentation of IT project costs is scattered throughout the business line presentations and is impossible to trace. Please provide a crosswalk of the IT projects, where their costs are located in the various budgets, and an explanation of whether those projects (if continuing from a previous rate period) were funded in other parts of BPA and the level of funding provided to them in previous periods so that a change in funding can be tracked and quantified.

One of the presenters expressed uncertainty over the IT costs associated with KSIs. Why might the IPR budgets have understated the KSI costs and by how much?

The capital IT costs for the BIS KSI are projected to be \$8M, \$9M, \$9M; all costs are to be re-deployed from IT's capital proposal in the current CIR tables based on prioritization of KSI work. The expense IT costs for the BIS KSI are less certain as we do not have projects clearly identified and placed in the IT queue at this time.

Fish and Wildlife KSI

Response to 1a:

The Fish and Wildlife KSI captures BPA's strategic approach to its environmental requirements with respect to the FCRPS Biological Opinion and related NEPA analysis. The work associated with this KSI includes the development of the Environmental Impact Statement under NEPA as well as interagency consultation documents (e.g., biological assessment, biological opinion) under the ESA.

Response to 1b:

The Fish and Wildlife KSI will continue beyond the FY2018-2019 rate period.

Response to 1c:

Expenditures for the Fish and Wildlife KSI have been underway since 2008 and will continue in FY2018-2019 to remain consistent with court-ordered timeframes and deliverables.

Commercial Operations KSI

Responses to 1a, b and c:

BPA appreciates PPC's line of questioning regarding the Commercial Operations KSI IPR costs. As described during the KSI Workshop, BPA will be refining these high-level cost estimates and associated benefits (e.g., cost reduction, increased revenue, etc.) between now and the IPR2 process. The high-level estimates provided to-date anticipate investments in technology as well as non-technology business process changes. These investments will be guided by the following principles:

- Protect and enhance our ability to serve our power and transmission customers
- Preserve the value of our federal assets
- Look for opportunities to co-optimize our power and transmission assets
- Identify the emerging market's impacts on our system
- Continue to fulfill our statutory, contractual and regulatory obligations

We understand the desire for detailed information on this important initiative and intend to engage customers as we develop further specifics.

Given BPA's ability to redeploy approximately 1/3 of the budget needed to support the KSIs, please share the scenarios BPA developed to show how it could fully fund the KSIs via redeployment of existing budgets only (i.e., implementing the KSIs with no increase to the budgets).

As outlined in the IPR/CIR Initial Publication, spending levels for the FY 2017-19 period were grounded in actual results. Organizations were requested to identify expense work that needed to be accomplished and were provided with a baseline spending level equal to 100 percent of their FY 2015 actuals. Organizations then prioritized their work that needed to be performed in 2017-2019. Once the baseline work and corresponding spending levels for organizations were established, KSI implementation cost estimates were layered in and reviewed.

The KSI cost requests that were in excess of the baseline amounts were subject to further scrutiny, discussion and justification from pool managers and IPR Executive Sponsors. This additional scrutiny of the KSI costs resulted in further reductions to the KSI cost estimates to factor in redeployment of existing resources to try to maintain lower spending levels but still allow for the KSIs to be resourced and staffed to move the initiatives forward.

What specific areas of spending would BPA cut to get a zero increase in IPR related costs? Are there risks of those specific cuts that you can identify? What specific areas of spending would BPA cut to reduce the proposed increase in IPR spending by 50%?

BPA recognizes the importance of centralized cost control; significant emphasis was placed on this during the development of the IPR spending levels. IPR programs were required to justify resource needs and any increase in proposed spending was thoroughly vetted and in most instances refined downward from initial submissions. This is true for BPA's Key Strategic Initiatives. BPA identified seven Key Strategic Initiatives as essential work efforts that support BPA's Priorities.

KSIs are aligned to BPA's Priorities and designed to deliver critical capabilities, from the safety of BPA's workforce to modernizing BPA's business information systems. These KSIs support and define how we will achieve our agency's strategic priorities. Thus, BPA does not propose reducing or eliminating the proposed spending for the Key Strategic Initiatives. All spending on KSIs is designed to improve BPA's long-term footing.

The proposed expenditures for BPA's KSIs are embedded in the Power and Transmission IPR proposals. In preparing work plans and resource estimates to support these initiatives, BPA resourced the initiatives to the maximum extent possible through redeploying existing resources. Redeployment is projected to cover 36% of the initiative spending proposal, with 64% of the initiative costs being incremental¹. KSI proposed expenditures represent 26% of the increased spending proposed across the Power and Transmission IPR proposal. For Power, KSI costs are part of Internal Operations and Fish and Wildlife costs. For Transmission, KSIs are integrated in Operations costs.

¹ Note – The Fish and Wildlife KSI is integral to BPA's Fish and Wildlife program. Thus no separate spend is estimated for this KSI. Incorporating the Fish and Wildlife program costs would greatly increase BPA's estimate of redeployed spending for KSI's.

The risk of reducing the KSI from proposed funding levels are significant as doing so would reduce BPA's ability to achieve the value and benefits each KSI is designed to deliver. The KSI's are described in detail in the preceding question as well as in BPA's [Initial Publication](#).

We acknowledge that BPA's seven KSIs vary in their specificity. Project planning, benefits estimates and sequencing activities across KSIs are underway. We expect more specific engagement on the Commercial Operations KSI as part of an IPR2 process this coming spring.

Additional Power Services Follow-ups

1. What specific areas of spending would BPA cut to get a zero increase in IPR related costs? Are there risks of those specific cuts that you can identify? What specific areas of spending would BPA cut to reduce the proposed increase in IPR spending by 50%?

BPA recognizes the importance of centralized cost control; significant emphasis was placed on this during the development of IPR spending levels. IPR program sponsors were required to justify any increase in proposed IPR spending above FY 2015 actuals. Proposals were thoroughly vetted with executives and appropriate business partners. In nearly all instances these initial submissions were revised downward.

An extensive effort to identify a spending scenario that would meet the request from the PPC would require significant time and resources. It would also require working collaboratively with our partners: Energy Northwest, Corps of Engineers and Bureau of Reclamation. To provide a timely response within the IPR timeline, what follows is a general description of the areas we would focus on for spending reductions and what the likely impacts would be.

The following estimated incremental rate pressure table presents proposed IPR spending.

Power Incremental Rate Pressure - BP16 to FY 18/19

	A	B
	Estimated Change FY 16/17 to FY 18/19	
	% Change	
	\$ (million)	in Rates
Revenue Requirement Costs		
1 Columbia Generating Station	14	0.7%
2 Bureau of Reclamation	10	0.5%
3 Corps of Engineers	10	0.5%
4 Fish & Wildlife	8	0.4%
5 Renewables	(3)	-0.1%
6 Energy Efficiency ^{1/}	0	0.0%
7 Internal Operations ^{2/}	15	0.8%
8 Undistributed Reduction ^{3/}	20	1.0%
9 IPR Expense Sub-Total	73	3.7%

1. **Energy Efficiency** - Excludes Legacy and EE Reimbursable Development Program

2. **Internal Operations** - includes Power's Non-Generation Operations, Agency Services G&A, Post Retirement Benefits and KSI Costs

3. **Undistributed Reduction** is estimated at \$10 million on average, annually for FY 2018-19.

Columbia Generating Station (CGS):

Columbia Generating Station's (CGS) O&M proposed IPR spending levels from FY 2016-17 to FY 2018-19 increased \$14 million, on average annually. Since the development of the CGS FY 2017 Long Range forecast in March 2016, CGS has reduced its O&M expense forecast by \$11 million over FY 2018-19. This reduction has been included in the proposed IPR forecasts. Energy Northwest continues to review the forecast to identify any additional reductions. Any further reductions of significance would impact the long-term reliability and performance of the plant by minimizing the resources needed to replace aging equipment, support refueling outages, respond to emergent issues and comply with additional regulatory mandates. Projects would be deferred and/or canceled. Deferred projects would likely cause a future bow wave of projects in need of funding. Reduced funding would likely increase the probability of extended plant shutdowns, likely resulting in lower performance and reliability. Unplanned outages could result in increased power purchase expenditures which would negatively impact Power's financial health.

Corps of Engineers (COE) & Bureau of Reclamation (BOR):

Due to the significant time and coordination required with the COE and BOR to fully address the potential impacts and risk associated with the proposed scenarios, staff evaluated the potential impact based on available information. Note that the proposed IPR spending levels were reduced by \$25 million from what was initially requested by the COE and BOR for FY 2018-19. If the COE and BOR combined IPR spending levels for FY 2018-19 were reduced further the impacts would be significant, particularly to projects funded by non-routine extraordinary expense (NREX).

The COE would only continue work on projects already funded; they would opt to defer any new work under this scenario. If new critical work were to emerge, lower priority projects would be evaluated and may be stopped, so resources could be redirected towards the critical projects. In the long run this would prove more costly due to inefficiencies triggered by starting and stopping work. This would harm the efficacy of the long range plan for the aging system resulting in lost generation revenue and declines in reliability while increasing the risk of equipment failures, hazardous conditions, code violations, unplanned outages, delays executing capital investments, environmental threats and pollution amongst other items.

The BOR would take on some risk of not being able to cover modifications to the Third Powerplant Overhaul at Grand Coulee. Any additional schedule slip or major modification would delay the return of those units to service resulting in lost generation revenue and reliability degradation.

Fish & Wildlife:

The Fish and Wildlife program results in only modest increases in IPR-related costs; about 2.5% for 2018 and 0% for 2019. The proposed spending for the Fish and Wildlife program are tied directly to commitments and requirements under the Endangered Species Act (ESA), the Northwest Power Act, long-term settlements and budget agreements – implemented through about 600 contracts per year. All funding BPA provides for the protection and mitigation of fish and wildlife helps fulfill its legal obligations, funding at lower levels would jeopardize our ability to satisfy these obligations. BPA works independently and jointly with the Northwest Power and Conservation Council to improve the cost-effectiveness of fish and wildlife spending and to reduce costs where feasible.

Internal Operations/Key Strategic Initiatives/Agency Services:

The proposed increase in Internal Operations of \$15 million consists of \$9 million supporting Key Strategic Initiatives and \$6 million for Agency Services support costs primarily for Information Technology (IT).

Internal Operations

Initial submissions for Power Internal Operations were roughly \$6 million higher, on average annually than those currently proposed in the IPR. Power Services worked diligently to find reductions to reach proposed spending levels equal to BP-16. Reductions were made to service contracts, supplemental labor, staff, travel and training accompanied by redirecting resources to highest priority work. If further reductions were required Power would freeze hiring except for critical positions, reduce or eliminate travel and training funding, terminate the student program along with other discretionary spending to lower its internal operating costs. These reductions would have significant impacts on our ability to deliver on our programs as well as employee morale.

Key Strategic Initiatives

Key Strategic Initiatives average \$9 million; please see the detailed response posted describing the impact of reducing and/or eliminating funding.

Agency Services Support Costs

IT has been underfunded in FY 2016-17 to accommodate new contracts and labor needed to support new systems and to meet business driven requests for system enhancement. To ensure the reliability of all production systems, IT has been delaying upgrades, curtailing system enhancements and reducing contract support. Eliminating Agency Services proposed increase for IT's would result in IT being unable to meet all hardware refresh rates, maintain all systems at a vendor supported version or meet business driven requests for system enhancements. In addition, IT would not be able to support new systems being delivered into production from the IT capital program – discretionary capital projects would need to be stopped until expense funding is ensured to support these new systems.

Undistributed Reduction:

The undistributed reduction in BP-16 was \$29.7 million on average annually and was included to recognize uncertainty in 2014 IPR spending forecasts after taking into account a new budget development methodology and historical underspend. Going into the 2016 IPR, development of spending forecasts was further refined and estimates were developed with a strong focus on cost control and achievable program execution. In doing so Power's risk of IPR expenses exceeding forecast in the operating year has increased compared to previous IPRs. Power believes the proposed IPR spending levels reflect the best forecast of spending for FY 2017-19. As a result Power proposed a lower undistributed reduction of \$10 million annually for FY 2018-19. Any increases to the undistributed reduction would significantly increase the probability that Power will under recover its costs in the rate period, thus increasing the probability of a CRAC in FY 2018-19.

2. **Please run the analysis using critical water (for example, using the data from the RHWM Process for "Total Federal System Hydro Generation" which is used to calculate the Tier 1 system, per the Tiered Rate Methodology Table 3.1)) instead of average water. I saw in your [follow up](#) response that "Critical Water Assumptions on Slide 17: The models generating this chart are geared toward long-term asset planning and the impacts of investment over long term horizons, hence the use of average water." However, our take-or-pay contracts are based on critical water, not average water. BPA recovers power**

costs via the Tier 1 rate which is allocated to customers based on the amount of power sold at critical water.

We appreciate the interest in seeing analysis that compares different levels of capital investment using the critical water conditions that determines the planned firm output that customers purchase at the Tier 1 rate. There are several observations we offer here, that hopefully address the underlying question of the service customers would receive under the proposed investments relative to a lower investment level.

Because the Tier 1 capability is an annualized value, Bonneville does not expect that maintaining the system increasing toward failure would have a meaningful impact on that calculation. Generation is typically shifted to other periods by capacity losses during critical water conditions rather than being lost. However, the Tier I load service impacts from an investment plan that does not substantially maintain the condition of the FCRPS would require additional analysis not provided by a critical water study. This is because while customer access to Tier 1 service is based on an annualized critical water capability and annualized load, actual load service is based on actual capability versus actual load at a given point in time. BPA's Needs assessment addresses these issues.

In the 2015 Needs Assessment the binding constraint BPA expects to face is Heavy Load Hour deficits, which are evaluated at the 10th percentile inventory and take into account variability in water supply, load, and Columbia Generating Station performance (please see page 51 of the [2015 White Book](#)). Under this metric and given current assumptions about system condition BPA already expects to face over 1,000 MW of deficit in meeting January customer loads by 2021. If Bonneville takes on higher system deterioration risk we would have to project that impact on that deficit and determine whether long-term purchases (and associated cost) were necessary to protect customer load service. It should be noted that while low flow conditions can result in excess turbine capacity that limit the impact of forced outages, two primary focus areas for the proposed investments are Grand Coulee and McNary. Grand Coulee would be heavily load factored to meet customer loads under low water conditions and McNary is a hydraulic bottleneck with a non-federal project upstream, making capacity at those projects particularly important – even in low water. Additionally, the unplanned nature of forced outages compels purchases in the marketplace under conditions of duress – resulting in higher costs. Slice customers would feel the impacts of these losses directly through a reduction in their Slice capability and block and load following customers would experience it through higher rates. While these impacts would not impact Tier 1 capability, they would likely impact the value/cost of Tier 1 service.

Additionally the Hydro Asset Strategy analytics will not produce meaningful results using critical water assumptions. The basic foundation of our analytical framework utilizes the marginal unit value at each facility as the primary input for determining the consequence of equipment failure. At critical water, the marginal value of a single additional unit outage at most facilities would be effectively zero, with generation losses only occurring if there are multiple, overlapping unit outages (which becomes more likely as investment is deferred). Because the model currently only uses the marginal unit to evaluate generation impacts, it would attribute no risk to investment deferral under critical water conditions and result in moving all replacements into the final year of the model run. This would suggest running the system to failure, which violates our statutory obligation to provide reliable generation to all of BPA's customers. In addition, using critical water assumptions does not make sense for purposes of long-term asset planning, in part because

critical water is a very low probability event and managing the system based on that assumption would leave it irresponsibly vulnerable during the majority of water conditions.

Lastly, BPA, Corps and Reclamation have statutory obligations to maintain facilities in order to reliably satisfy both authorized purposes and biological obligations within the FCRPS (Facilities must be maintained in order to serve load during critical water conditions as well as effectively manage water across the spectrum water conditions).

3. Please also re-run the sensitivity analysis (shown on slide 37) using critical water.

Please see response to question #2.

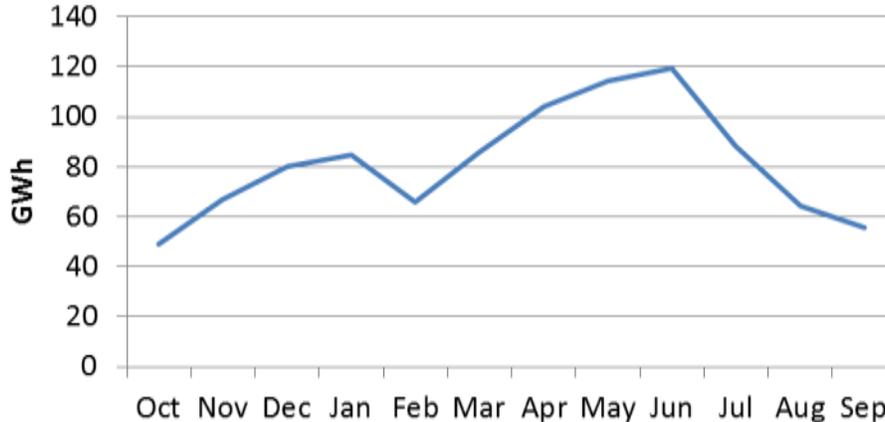
4. Please provide the expected generation monthly shape of the estimated additional 1,000 GWh of capacity if the hydro capital budget is increased by \$100M/year.

The 1,000 GWh is an expected value based on the probability of failure of individual pieces of equipment. Equipment failure risk in our modeling is performed on an annual basis and does not model at which point within a year equipment may fail. Thus, the consequence of a two month outage, for example, is multiplied by a flat levelized annual energy price derived from the forward spot energy price forecasts used in the rate case. This is used in the calculation for determining the optimal timing of investment in each piece of equipment; however, the methodology is different in the Long Term Finance and Rates Screening Tool.

The Screening Tool calculates rates on an annual basis, in a manner consistent with the established BPA rate case methodology, and does this in a fully risk-informed environment. That is, beginning with Federal loads and resources, and using simulated market conditions, it captures the effects of varying levels of hydro generation through both critical hydro generation, which determines the Tier 1 System Shaped Load, as well as the amount of secondary energy available for sale. The model operates over a 15-year time horizon, and simulates 3,200 rate levels based upon stochastic hydro generation, market prices and loads.

A given capital investment level affects the modeled results in two ways. First, any increment or decrement to critical hydro generation (i.e. 1937 water) is used to determine BPA's load resource balance for program cost allocation. In essence, higher generation during critical water has the effect of increasing the amount of firm energy available. This, for any given revenue requirement, has the effect of reducing the Tier 1 Average Net Cost of Power because a given cost base is effectively spread out over more megawatt-hours. Second, it affects the amount of secondary energy available for sale. The Hydro Asset Strategy modeling (described in the Explanation of Least Cost and Net Present Value paper as well in within the 2016-2030 Hydro Asset Strategy) produces an annual expected difference in generation at given capital program levels. A simple regression analysis was performed in order to establish a relationship between flow and lost generation at the system level for various capital investment levels in order to preserve the risk-informed nature of the Screening Tool. The shape for a representative average water year is provided below.

Expected Shape of Incremental Generation from Increased Investment



5. Please provide underlying data and analysis of the hydro investment strategy described in the workshop materials, including the \$200M and \$300M per year options, and the sensitivity analysis; both for average water and for critical water.

Please see response to question #2.

6. Please provide the analysis and underlying documentation or work papers indicating that accelerating hydro investment from \$200 million a year to \$300 million a year has a net present value of \$882 million. (June 21 hydro presentation, slide 27)

Please refer to the Explanation of Least Cost and Net Present Value paper and the [2016-2030 Hydro Asset Strategy](#).

7. Please provide the analysis and underlying documentation or work papers indicating that accelerating hydro investment from \$200 million a year to \$300 million a year has a positive net present value of \$121 million, even if market power prices remain at 20 mills indefinitely. (June 21 hydro presentation, slide 37)

Please refer to the Explanation of Least Cost and Net Present Value paper and the [2016-2030 Hydro Asset Strategy](#).

8. Please provide planned hydro investment by plant under both the status quo \$200 million investment level and the proposed \$300 million from FY16-30 or as far out as available. (June 21 hydro presentation, slide 29)

Please refer to the [2016-2030 Hydro Asset Strategy](#), pages 72 and 88.

- 9. Please provide the analysis and underlying documentation or work papers indicating that by 2028, the percentage of equipment in marginal and poor condition at the main stem Columbia and Headwater/Lower Snake dams will increase from 25% to 40% with a capital budget of \$200 million a year, and that the overall condition of the system will stay relatively constant with a capital budget of \$300 million a year. (June 21 hydro presentation, slide 30)**

Please refer to the [2016-2030 Hydro Asset Strategy](#), pages 61 and 62 for a description of hydroAMP condition assessment and the methodology for condition degradation forecasts.

- 10. Slide 32 of indicates that lost generation risk is forecast to decline from 668 aMW to 140 aMW under the \$300 million investment level by 2028, and to 308 aMW under the \$200 million investment level. Why is the lost generation risk forecast to decline under the \$200 million investment level, when the overall condition of the hydro system is declining at the \$200 million investment level? (June 21 hydro presentation)**

Under both a \$200 million and \$300 million investment level, significant investment is made in powertrain components at Grand Coulee and McNary. These two plants represent about half of the current lost generation risk on the system. With a \$200 million program, there are few remaining funds to invest outside of Grand Coulee and McNary, resulting in the larger aggregate decline in system condition.

- 11. Regarding slide 26, please provide any additional information or estimate of the magnitude of projected needs for additional investment in dam safety civil features beyond the current focus period. (June 21 hydro presentation)**

The current asset registry largely does not include these civil features; however, we recognize the need and are currently structuring an effort to inventory these assets in order to more thoroughly assess the risks and costs associated with them.

- 12. Regarding slides 17 and 31-32, PPC would like to see the lost generation risk for the current and proposed capital spending levels conducted under critical water conditions. (June 21 hydro presentation)**

Please see response to the first question.

- 13. Regarding page 34 of the IPR/CIR “Initial Publication June 2016” Document, please describe the source of the increases from FY 2015 actuals in the areas of “Non-Generating Operations” and “Internal Support.”**

Non-Generation Operations:

Both Power and Agency Services organizations can charge/budget into Non-Generation Operations. The proposed \$21.6 million increase from FY 2015 actual spending is due primarily to the addition of the Commercial Operations KSI, \$8.3 million, and small increases in Information Technology, \$1.6 million; Research and Development, \$1.2 million; and Environmental Compliance, \$1.4 million. These increases were partially offset by decreases of \$2.9 million in other Agency Services costs. The remainder is driven by Power costs, roughly \$6.8 million for allocated staffing costs, \$1.0 million for the Asset Management KSI and just shy of \$4.2 million for Service contracts.

Power Internal Support:

This program is composed of G&A allocated to Power and Post-Retirement Benefits. The total increase is \$13.6 million from FY 2015 actual spending.

G&A increased \$12.7 million. The primary driver of this increase was the full distribution of G&A to the F&W program at \$12 million. There is a corresponding decrease of \$4 million in the F&W program as that is where the F&W G&A was reported in FY 2015. The remaining \$0.7 million was small increases in various G&A pools.

Post-Retirement benefits increased by \$0.9 million. This calculation was updated to reflect current federal FTE (BPA, Corps and Reclamation) supporting the power function of the FCRPS.

South of Allston IPR Follow-ups

Please provide the analysis used to compare non-wires options for South of Allston versus the I-5 reinforcement build.

BPA undertook and continues to examine options for the SOA path. This includes continuing to examine non-wire options including but not limited to demand response, energy efficiency, redispatch, etc. This analysis includes continuing to refine and update system modeling information, regional dialogue and examining other potential new technology, to highlight a few areas. The analysis looks at system operating limits, congestion issues, outage contingences, reliability, compliance and other key factors. This is a dynamic process as new information becomes available in this ever changing market which impacts cost effectiveness, reliability, feasibility, etc. for the potential of a non-wire option. The I-5 EIS released earlier this year provides additional information on steps BPA has taken in regards to non-wire option analysis.

Please provide the analysis used to develop the proposed expense and capital budgets for the South of Allston non-wires options.

- **Proposed IPR: \$10M in 2018-19 and \$10M/year for next 9 years (totaling \$100M over 11 years).**

At the point in time we were developing the IPR budgets, Transmission Services anticipated responses to an upcoming RFP seeking innovative alternative solutions to the South of Allston congestion issue. The proposed levels of expense funding were our best judgment of the anticipated annual costs of the alternative solutions. It was anticipated that these solutions to the congestion would be needed for approximately 10 years which would allow us time to continue to evaluate whether this approach would mitigate the risk or if a more permanent solution would be needed. With the RFP responses now in hand, we are fairly confident in these projections.

- **Proposed CIR: \$25M in 2019, \$50M/year in 2020-22 and \$25M in 2023 (totaling \$200M over 5 years).**

We expect that a combination of non-wires solutions and equipment upgrades and/or additions is needed in lieu of a full transmission line build. The decision was made to remove the I-5 Corridor Reinforcement budget out of the CIR forecast and in its place, insert placeholders of forecasted funding for capital upgrades. The amount of the placeholder was based on a combination of previously studied and estimated plans of service that may be executed in the near term plus anticipated similar projects that may be required between 2020 and 2023.

Additional IPR Follow-ups

Given BPA's projection to run out of borrowing authority (excluding the \$750M short term Treasury facility) and subsequent assumption to accelerate repayment of federal debt starting in the 2020s, please share the scenarios BPA developed to show how it could reduce its capital budget so it does not run out of borrowing authority without having to accelerate federal repayment.

Bonneville hasn't developed any scenario that reduces the capital budget to maintain access to U.S. Treasury borrowing authority. However, the additional payments that were made to maintain borrowing authority could also be viewed as reductions to the capital budget to reach the same goal. The correlation isn't exactly 1:1, but it is a very good approximation.

How much spending on current IT projects is set to expire during the upcoming rate period?

What are the O&M costs of current IT projects that will be in the next rate period? The O&M tail associated with current IT projects is estimated to be 8% of the investment cost of these projects. For example, in FY 17 our investment in discretionary business systems is \$15m, which generates a net new O&M expense of \$1.2m in FY 18. Historically, this 8% O&M "expense tail" has proven to be quite accurate.