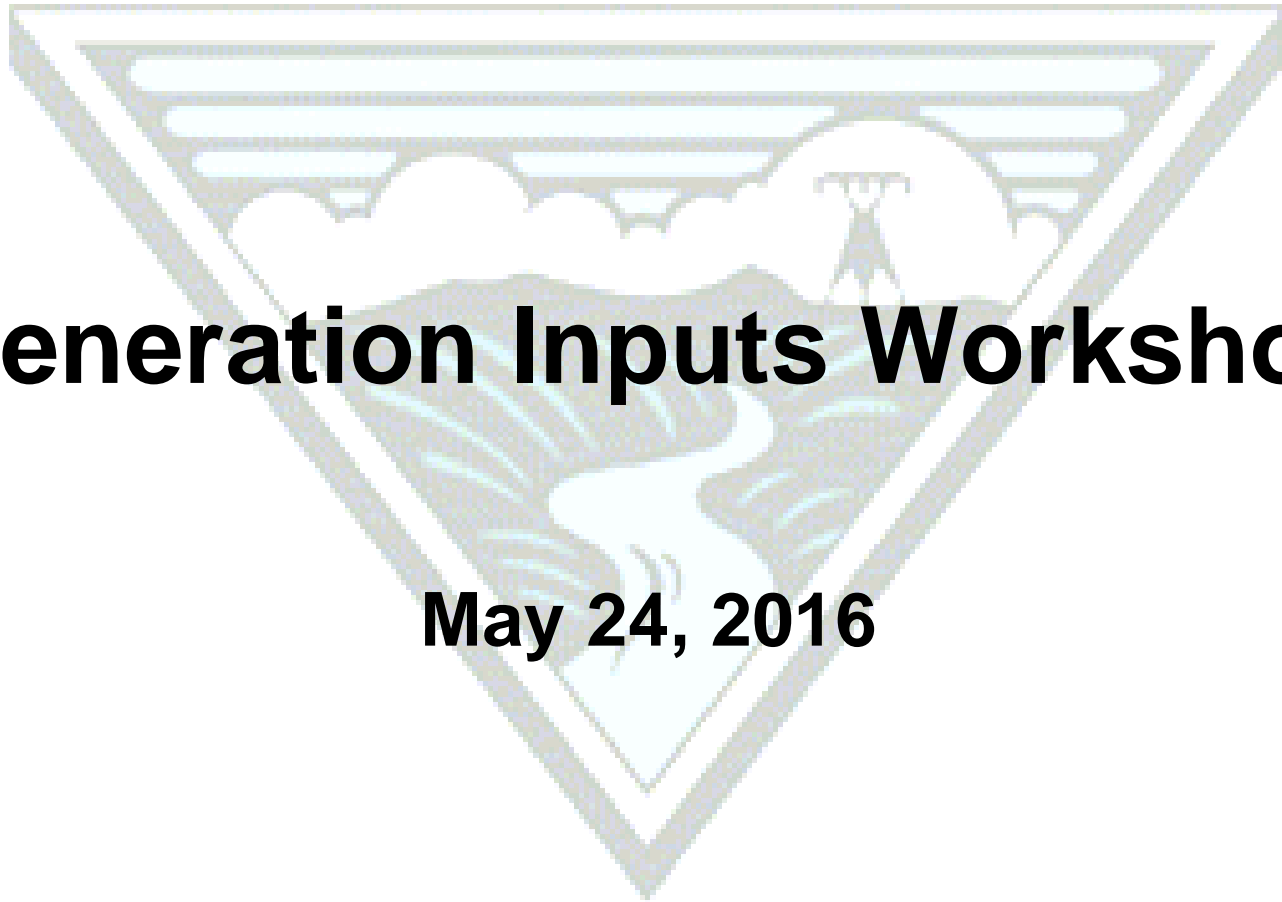


B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N



Generation Inputs Workshop

May 24, 2016

B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N

Preliminary Balancing Reserve Capacity Quantity Forecast

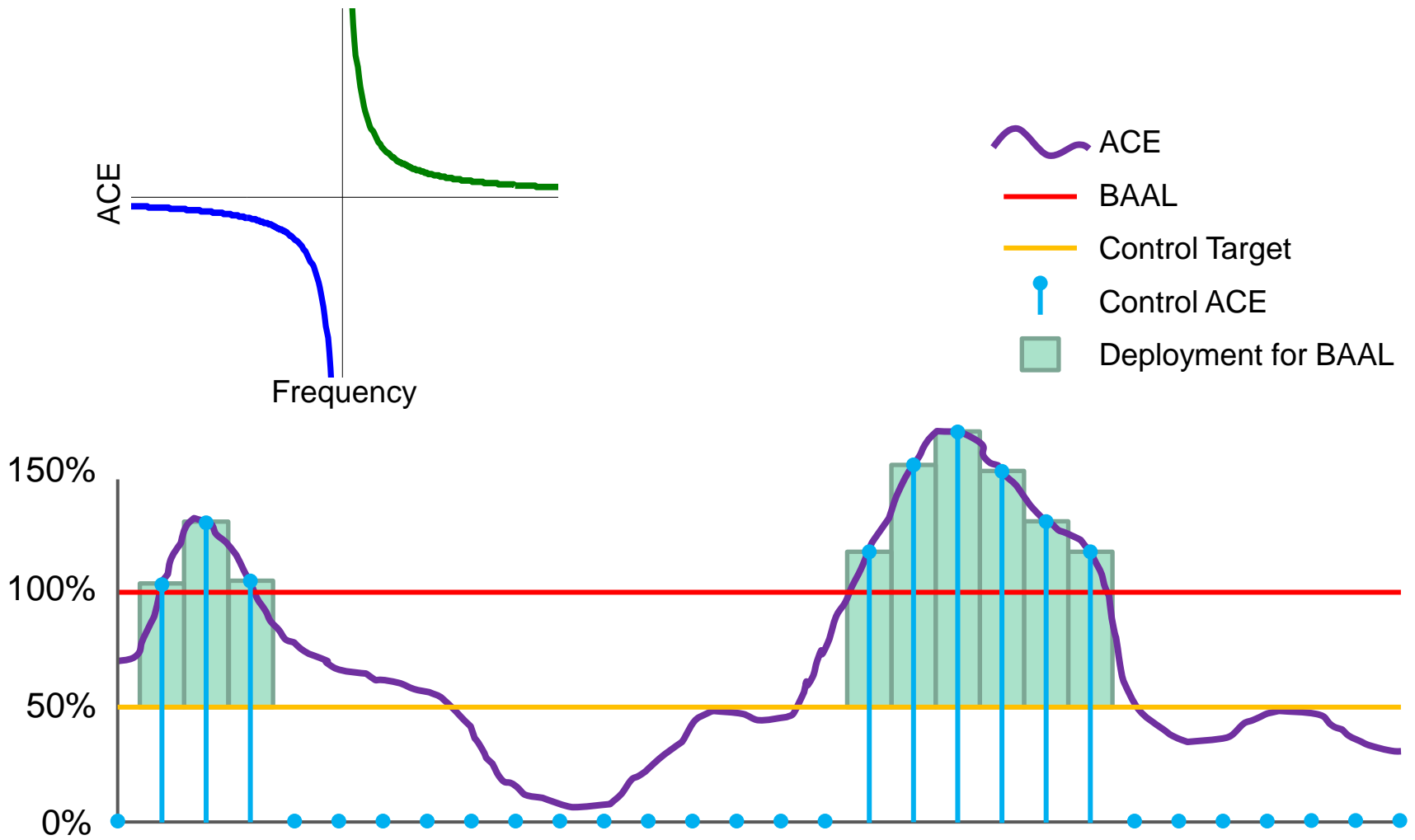
Libby Kirby

Assumptions

- Wind Departure:
 - Portland General Electric and Puget Sound Energy are currently modeled as withdrawing their wind from our BA on 11/1/17
 - Avangrid (formerly Iberdrola) is currently modeled as withdrawing their wind from our BA on 12/1/17
- Balancing Authority ACE Limit (BAAL, based on BAL-001-2) is included (except where indicated).
- Scheduling elections have been updated per the mock elections for BP-18. Mock elections showed movement from uncommitted to 30/15 and from uncommitted to 30/60.
- *INC and DEC* values were calculated to a 99.7% coverage of the total distribution (except where indicated)
 - INC percentile distribution calculated at 99.85%, DEC at 0.15%

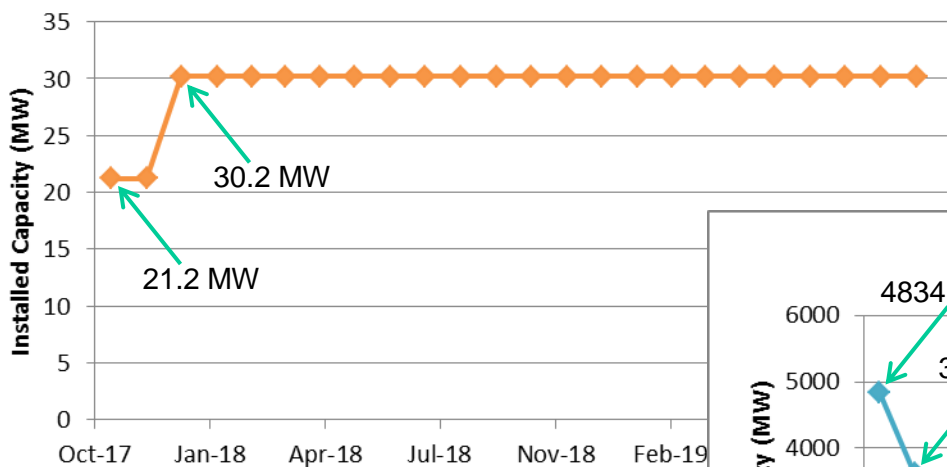


BAAL Control Mechanism

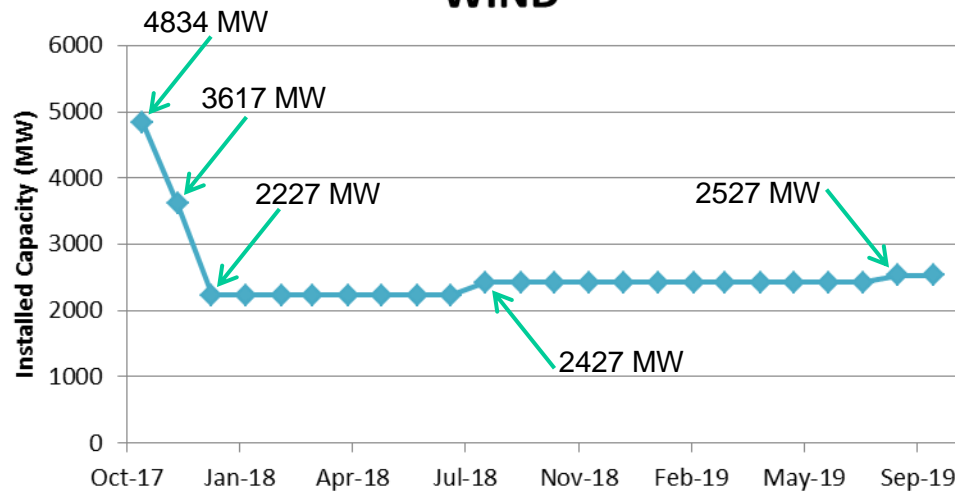


Installed Capacity

SOLAR



WIND



No other changes to generation fleet



INC Reserves (Prior to Application of BAAL)

Date	Total INC Reserves (MW)	Load net Hydro/CGS Reserves (MW)	Wind Reserves (MW)	CSGI Reserves (MW)	Solar Reserves (MW)	DERs Reserves (MW)
Oct-17	767	295	372	80	0.3	19
Nov-17	643	287	254	81	0.3	21
Dec-17	615	290	300	0	0.9	24
...
Jul-18	615	290	300	0	0.9	24
Aug-18	620	287	308	0	0.9	24
Sep-18	620	287	308	0	0.9	24
Oct-18	622	291	306	0	0.9	24
...
Jul-19	622	291	306	0	0.9	24
Aug-19	636	292	319	0	0.9	24
Sep-19	636	292	319	0	0.9	24
Rate Case Average	628	290	306	7	0.9	24



Explanation of Pre-Wind Departure Reserve Number

Prior to any wind generation departure and prior to the application of the BAAL, the total reserve number is already noticeably lower than what is currently held. This is due to two main influences:

- 6-year data set (BP-18) vs. 4-year data set gives us a less volatile set
- Superior scheduling elections (movement from Uncommitted to 30/15 and 30/60) provides for less station control error

Date	Total INC Reserves (MW)		
Oct-17	767	FY '10 - FY '13 Data Set	FY '10 - FY '15 Data Set
		BP-16 Scheduling Elections	904
		Mock Scheduling Elections	805
			767



DEC Reserves (Prior to Application of BAAL)

Date	Total DEC Reserves (MW)	Load net Hydro/CGS Reserves (MW)	Wind Reserves (MW)	CSGI Reserves (MW)	Solar Reserves (MW)	DERs Reserves (MW)
Oct-17	-935	-334	-498	-81	-0.4	-22
Nov-17	-766	-328	-330	-84	-0.5	-23
Dec-17	-723	-328	-367	0	-1.2	-27
...
Jul-18	-723	-328	-367	0	-1.2	-27
Aug-18	-732	-325	-379	0	-1.2	-27
Sep-18	-732	-325	-379	0	-1.2	-27
Oct-18	-733	-329	-376	0	-1.2	-26
...
Jul-19	-733	-329	-376	0	-1.2	-26
Aug-19	-760	-333	-399	0	-1.2	-26
Sep-19	-760	-333	-399	0	-1.2	-26
Rate Case Average	-741	-329	-378	-7	-1.1	-26



INC Reserves with All Changes (BAAL, Mock Scheduling Elections, Wind Departure)



Date	Total INC Reserves (MW)	Load net Hydro/CGS Reserves (MW)	Wind Reserves (MW)	CSGI Reserves (MW)	Solar Reserves (MW)	DERs Reserves (MW)
Oct-17	641	247	311	67	0.2	16
Nov-17	533	237	210	67	0.3	17
Dec-17	501	236	244	0	0.8	20
...
Jul-18	501	236	244	0	0.8	20
Aug-18	506	234	251	0	0.7	20
Sep-18	506	234	251	0	0.7	20
Oct-18	507	237	250	0	0.8	19
...
Jul-19	507	237	250	0	0.8	19
Aug-19	520	239	261	0	0.7	19
Sep-19	520	239	261	0	0.7	19
Rate Case Average	513	237	250	6	0.7	19



DEC Reserves with All Changes (BAAL, Mock Scheduling Elections, Wind Departure)

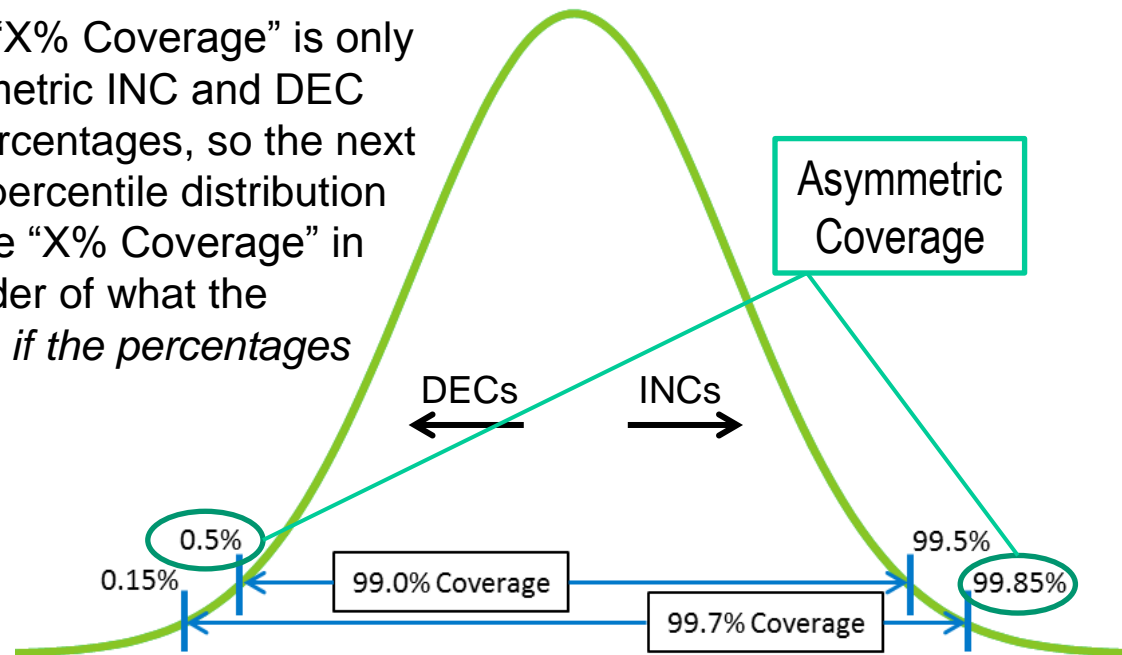


Date	Total DEC Reserves (MW)	Load net Hydro/CGS Reserves (MW)	Wind Reserves (MW)	CSGI Reserves (MW)	Solar Reserves (MW)	DERs Reserves (MW)
Oct-17	-793	-282	-426	-68	-0.4	-18
Nov-17	-642	-274	-278	-70	-0.4	-20
Dec-17	-597	-270	-304	0	-1.0	-22
...
Jul-18	-597	-270	-304	0	-1.0	-22
Aug-18	-603	-267	-313	0	-1.0	-22
Sep-18	-603	-267	-313	0	-1.0	-22
Oct-18	-604	-271	-311	0	-1.0	-22
...
Jul-19	-604	-271	-311	0	-1.0	-22
Aug-19	-631	-276	-333	0	-1.0	-22
Sep-19	-631	-276	-333	0	-1.0	-22
Rate Case Average	-614	-271	-314	-6	-0.9	-22



Percentile Distribution and Coverage

- *INC and DEC* values were calculated to a 99.7% coverage of the total distribution up until this point
 - INC percentile distribution calculated at 99.85%, DEC at 0.15%
- The next slide shows the changes in reserves if the DEC values are calculated at the 0.15%, the 0.25% and the 0.5% of the percentile distribution.
 - Technically, referring to “X% Coverage” is only clear if we’re using symmetric INC and DEC percentile distribution percentages, so the next slide is labeled with the percentile distribution percentages, and has the “X% Coverage” in parentheses for a reminder of what the coverage would look like *if the percentages were symmetric*

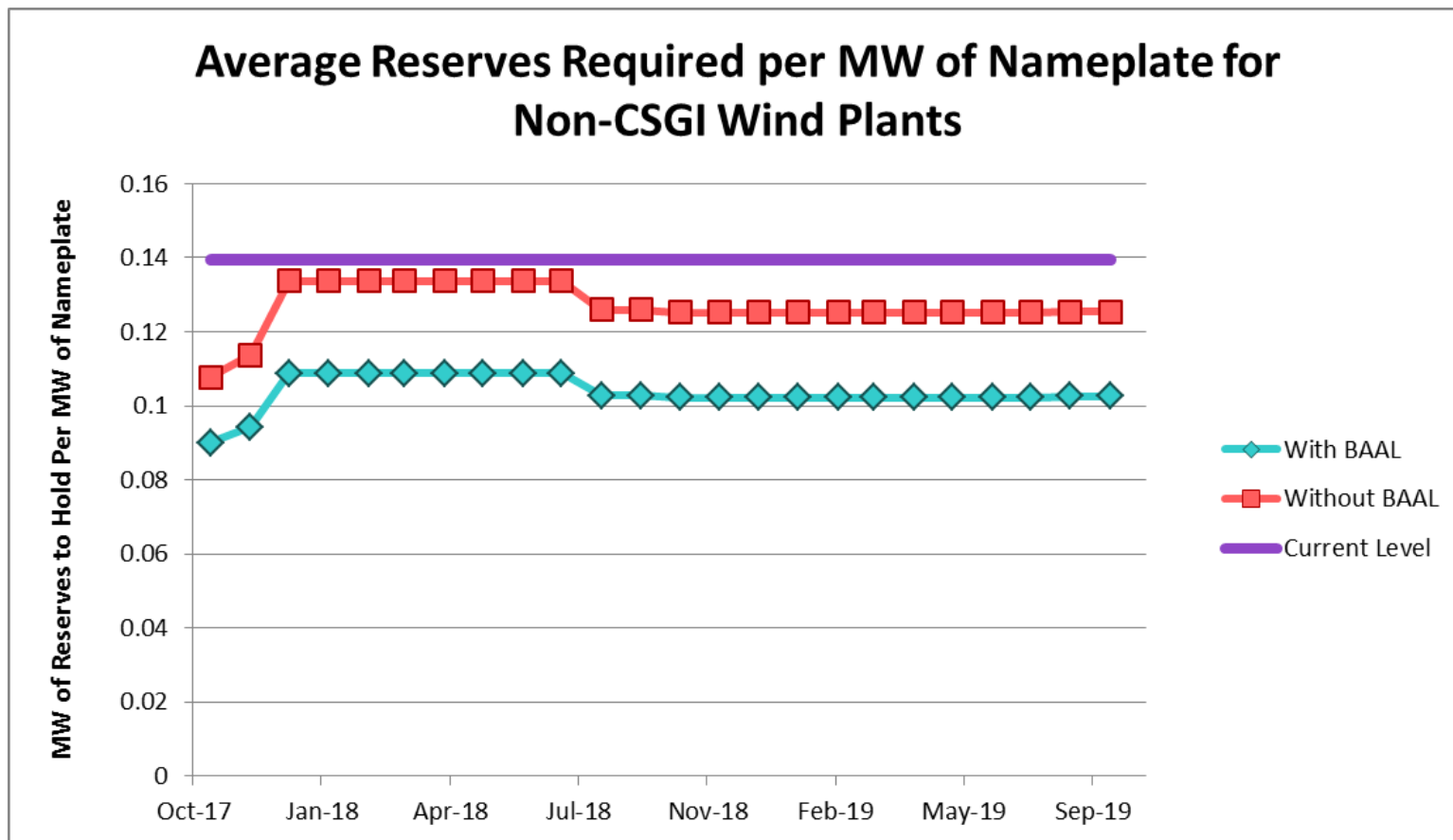


DEC Reserves at Various Confidence Intervals

Date	Total DEC Reserves (MW)					
	Calculated at 0.15% ("99.7% Coverage")		Calculated at 0.25% ("99.5% Coverage")		Calculated at 0.5% ("99.0% Coverage")	
	Reserves (MW)	Monthly AVG OCBR Limitations	Reserves (MW)	Monthly AVG OCBR Limitations	Reserves (MW)	Monthly AVG OCBR Limitations
Oct-17	-793	7.5	-698	11.8	-577	22
Nov-17	-642	8.5	-560	14.2	-458	26
Dec-17	-597	8.7	-522	14.0	-430	26
...
Jul-18	-597	8.7	-522	14.0	-430	26
Aug-18	-603	8.6	-530	14.0	-437	26
Sep-18	-603	8.6	-530	14.0	-437	26
Oct-18	-604	8.7	-531	14.0	-438	26
...
Jul-19	-604	8.7	-531	14.0	-438	26
Aug-19	-631	8.0	-552	13.3	-456	25
Sep-19	-631	8.0	-552	13.3	-456	25
Rate Case Average	-614	8.6	-538	13.9	-443	26



Diversity Impact to Wind



B O N N E V I L L E

**Communication Flow to Suppliers
during Spring Third-Party Supply
Acquisition Process**

Acquisition Budget Update

John Wellschlager

Overview

- Communication Flow to suppliers during spring acquisition process
 - Review preschedule release, bid and acceptance timelines.
 - Review criteria used when asked about any bids not being selected.

- Acquisition Budget Update
 - Review acquisition budget spent to date.



Preschedule Request for Offers release, bid and acceptance timelines

- Once the additional amount (if any) of FCRPS reserves is known for the coming pre-schedule period (approximately 3:00 pm), a second R3T model run is done (approximately 3:20).
- If an additional reserve need is shown to exist above the base FCRPS + Long-term acquisitions + additional FCRPS (if any) then Power Services releases an RFO no later than 5:00 pm that same day.
- The following day, another R3T model run is completed and shared by TS to PS no later than 7:45 am.
- PS uses this model run to gauge the amount of reserves needed for the coming pre-schedule period.
- By 8:00 am bids are due from suppliers.
- TS issues a purchase order to PS based on the earlier R3T model run.
- PS evaluates and rank orders bids from 8:00-9:00 am.
- By 9:00 am PS issues award notifications to selected Suppliers via email (bidders not selected are notified as well).
- Between 9:00 am and 2:00 pm PS works with the selected counterparties to get all the necessary scheduling and transmission information.



Information provided to bidders not selected

- Email notification is provided to all suppliers submitting offers.
- Should a supplier who wasn't selected ask why, we offer the following standard response:

The reason for not selecting your bid can be one of three reasons

- The need forecast went down after the RFO was released.
 - Enough offers were received to meet our needs that were lower in price than your offer.
 - The submitted price would result in expenditures exceeding the advisory budget for the day.
- It should be noted that any additional FCPRS reserves supplied are only done before the RFO is calculated and released. We do not allow any additional availability of the FCRPS after that time to displace submitted offers.



Acquisition Budget spent to date

- Per the Rate Case Settlement agreement BPA has a budget of \$17.5 million to cover our spring acquisition needs. To date, we have spent the following amount:
 - Total Capacity Acquisitions as of 05/21/2016 (\$4,694,940)
 (note that this includes both long-term and preschedule acquisitions)
 - Total Energy deployment costs through 4/30/2016 (\$53,936)
 (costs are based on percentage bid above the Powerdex index)
 - Intentional Deviation Opt Out fee through 6/30/2016 \$203,715
 - **Total Spent to date** **(\$4,545,161)**
 - **Budget remaining** **\$12,954,839**



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**Draft Rate Estimates for
Balancing Services**



Draft Rate Estimates for BP-18

- Used the results of the balancing reserve requirement study to calculate draft ranges for BP-18 balancing rates
- Assumptions:
 - No policy or rate design changes from BP-16
 - **Sales:** Name plate and billing factor based on draft forecasts for BP-18
 - **Revenue Requirement:** Used estimates for embedded costs shared at the March workshop: Max and Average (high range) and Load Factor (low range)



Draft Rate Results

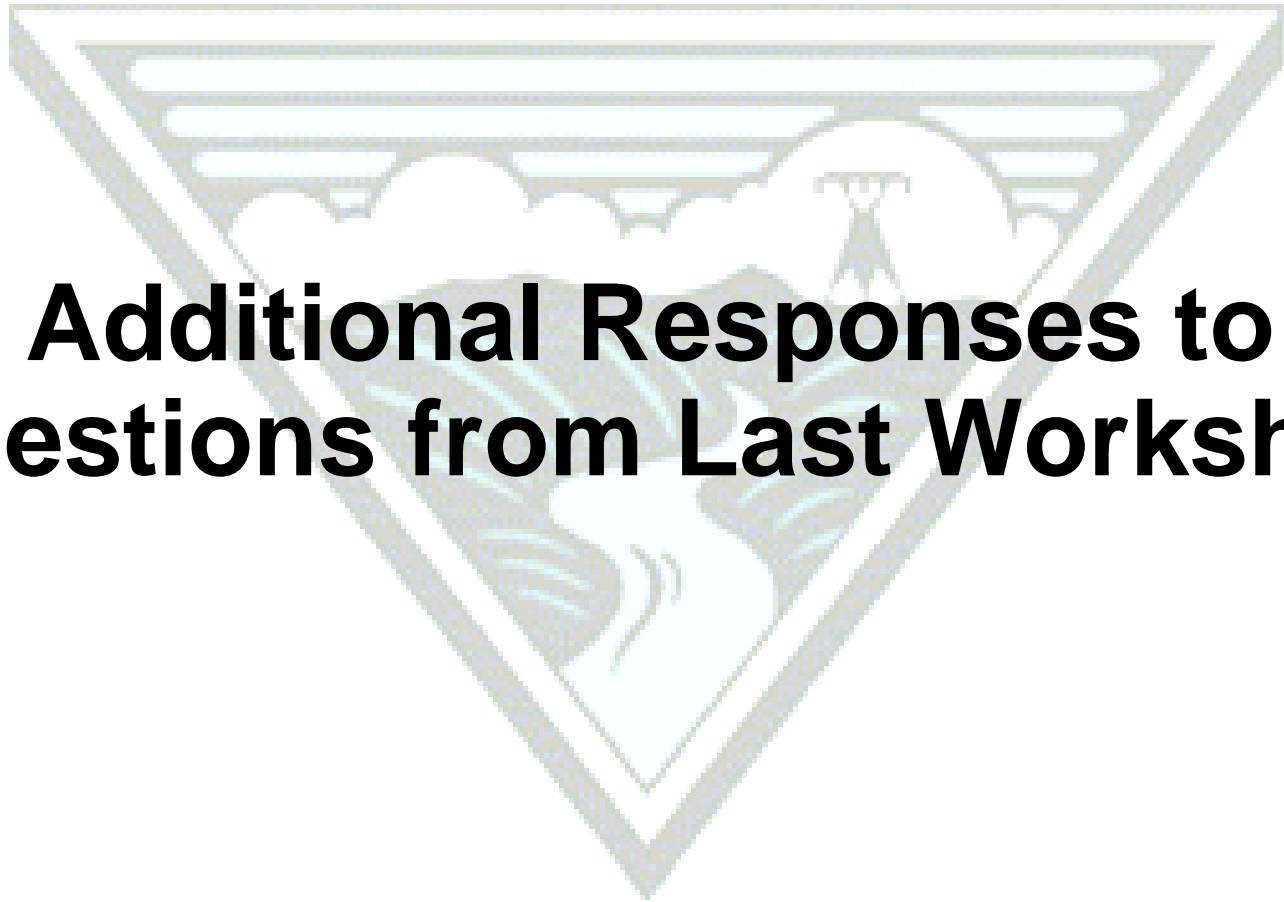
VERBS (\$ per kW-mo.)		BP-18 Estimate			
		Low		High	
	BP-16 Rates*	\$	% Change	\$	% Change
Wind Avg	\$1.09	\$0.70	-36%	\$1.01	-7%
Solar Avg	\$0.21	\$0.31	47%	\$0.45	113%

*Weighted average VERBS wind rate based on BP-16 rates and BP-16 installed capacity

DERBS (mills per kW max hourly deviation)		BP-18 Estimate			
		Low		High	
	BP-16 Rates	\$	% Change	\$	% Change
Inc	\$18.15	\$21.92	21%	\$33.22	83%
Dec	\$3.94	\$2.23	-43%	\$2.23	-43%



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**Additional Responses to
Questions from Last Workshop**

- At the last workshop a customer asked how much revenue the Intentional Deviation has generated. The total of the Intentional Deviation Penalty Charge since October 2015 is approximately \$638,000.
- The process for a wind project to leave the BPA Balancing Authority Area is in the process of being posted on the BPA Web site. The link will be available at the time of the workshop.
- Dynamic Transfer Capability issues will be discussed at a Transmission workshop on July 13th.

