Western Area Lower Colorado (WALC) Balancing Authority

Ancillary Services
Formula Rates

Jack Murray, DSW Rates Manager
Jon Aust, AGC Reliability Manager

Desert Southwest Region
Informal Customer Meeting
August 10, 2015

Agenda

- Welcome and Introductions
- Why We're Here
- Proposed Changes
- Next Steps
- Preliminary Look at FY16 Rate Updates
- Contact Information
- Time for Questions

Why We're Here

- Existing formula rates for WALC Ancillary Services are set to expire September 30, 2016.
- Required to conduct Formal Public Rate Process in order to put formulas in place for a new 5-year period.
- Western wants to share our proposed changes with customers.

Items for Discussion

- WALC Ancillary Service Rates
  - Scheduling, System Control, and Dispatch *
  - Reactive Supply and Voltage Control from Generation or Other Sources*
  - Operating Reserves – Spinning Reserves*
  - Operating Reserves – Supplemental Reserves*
  - Network Integration Transmission Service (NITS) for P-DP and Intertie*
  - Losses
  - Regulation and Frequency Response
  - Generator Imbalance
  - Energy Imbalance
  - Unreserved Use Penalty

* No changes planned

New Rate Schedule Proposal
Transmission Losses

Transmission Losses

- Western developed a WALC-wide loss rate in 2004, but did not create a separate rate schedule.
- While not technically a defined ancillary service, WALC is adding a new Rate Schedule for Transmission Losses.
- Currently Transmission Losses are addressed in the rate schedules for transmission service for each of the DSW transmission systems: Parker-Davis, Intertie and Central Arizona 115/230kV.
- Creating a single BA rate schedule for transmission losses will ensure consistent treatment across projects.

Western AREA POWER ADMINISTRATION

Rate Proposals
Regulation and Frequency Response Service

Regulation - changes

- Western is working on a new method for determining the Regulation Requirement for the BAs (WACM and WALC).
- Proposal is to modify the existing one for one nameplate assessment by implementing a “Variable Multiplier” (that will be re-evaluated on an annual basis) for the nameplate assessment .
- Intent is to implement separate multipliers for wind and solar.

Regulation Requirement Methodology

- Regulation requirement is derived to assure that the BA has adequate time to respond to unknown circumstances, including a percentage of ACE deviation events that exceed 10 minutes, and to have adequate resources available continuously to meet compliance with the following:
  - BAL-001: R1 (CPS1 must exceed 100% for the preceding 12 months, evaluated monthly) and R2 (ACE must not exceed the BAAL for more than 30 consecutive clock-minutes).

WALC Regulation Requirement

- WALC's rate has historically included a Regulation Requirement of 57MW, plus an additional 8MW from CRSP, based on a percentage of ACE deviation events over a 12 month period.
  - A recent analysis shows WALC's requirement continues to be 57MW, plus the 8 from CRSP
    - WALC will continue to set aside the 57+8 for the BA based on the study.
    - To meet new needs within the BA, WALC will pursue sources of Regulation Assistance from other entities.
    - WALC is pursuing agreements with BA customers and neighbors to supplement regulation needs:
      - Additional generation back-down agreements
      - Interchange sharing amongst neighbors
      - ACE Diversity within the BA
      - Capacity agreement with traditional generation

WALC Regulation Requirement – Cont'd

- WALC regulation requirement was unchanged from previous studies. Some BA changes occurred, but overall the net change was zero.
  - CRSP moved its generation out of WALC and into WACM.
  - Many loads have moved from directly under WALC to move under Sub-BA participants.
  - Some loads/generators have moved in and out of the BA (Trico, IPP's etc).
  - Overall these changes results in very little change to the overall BA characteristics, resulting no change to the requirement.

Regulation Requirement Study Results

- Based on the historical events for the WALC BA we determined that 90% of events were within 57MW and 99% of events exceeding 57 MW are less than 10 minutes.
- The probability of events occurring outside of that band is 0.4% and therefore acceptable for WALC to stay within acceptable limits on its compliance standards

Regulation Requirement Results Screenshot

# events > 200 MW	5	0.14%	# events > 30 Min	1	0.03%
# events > 175 MW	11	0.31%	# events > 28 Min	2	0.06%
# events > 150 MW	26	0.74%	# events > 26 Min	4	0.11%
# events > 125 MW	58	1.64%	# events > 24 Min	11	0.31%
# events > 100 MW	136	3.85%	# events > 22 Min	37	1.05%
# events > 95 MW	157	4.45%	# events > 20 minutes	90	2.55%
# events > 90 MW	172	4.88%	# events > 19 minutes	107	3.03%
# events > 85 MW	185	5.24%	# events > 18 minutes	123	3.49%
# events > 80 MW	203	5.75%	# events > 17 minutes	133	3.77%
# events > 75 MW	218	6.18%	# events > 16 minutes	147	4.17%
# events > 70 MW	246	6.97%	# events > 15 minutes	162	4.59%
# events > 65 MW	272	7.71%	# events > 14 minutes	176	4.99%
# events > 60 MW	299	8.48%	# events > 13 minutes	199	5.64%
# events > 55 MW	343	9.72%	# events > 12 minutes	219	6.21%
# events > 50 MW	400	11.34%	# events > 11 minutes	262	7.43%
# events > 45 MW	462	13.10%	# events > 10 minutes	309	8.76%
# events > 40 MW	554	15.70%	# events > 9 minutes	355	10.06%
# events > 35 MW	646	18.31%	# events > 8 minutes	421	11.93%
# events > 30 MW	769	21.80%	# events > 7 minutes	505	14.31%
# events > 25 MW	944	26.76%	# events > 6 minutes	616	17.46%
# events > 20 MW	1196	33.90%	# events > 5 minutes	787	22.31%
# events > 15 MW	1579	44.76%	# events > 4 minutes	1067	30.24%
# events > 10 MW	2176	61.68%	# events > 3 minutes	1530	43.37%
# events > 5 MW	3528	100.00%	# events > 2 minutes	2156	61.11%
# events > 1 MW	3528	100.00%	# events > 1 minutes	2931	83.08%
# events > 0 MW	3528	100.00%	# events > 0 Min	3528	100.00%
# events = 0 MW	0	0.00%	# events = 0 min	0	0.00%
total events	3528	100.00%	total events	3528	100.00%
max size event "-"	**-212.6**		min length event	**1**	
max size event "+"	**255.79**		max length event	**32**	
average event MW "-"	-24.098		average event length "-"	4.467	
average event MW "+"	23.414		average event length "+"	4.591	

Regulation Nameplate Assessment - changes

- Since 2012, WALC's Regulation rate schedule has included a one for one load-based assessment on the installed nameplate capacity of intermittent generators serving load inside WALC.

- DSW has marketed the maximum practical amount of power from its projects, which leaves little flexibility for additional regulation needs. Beginning in FY12, the rate schedule included an "Exporting Intermittent Resource Requirement" that required an intermittent generator serving load outside WALC to dynamically meter/schedule that resource to another BA.

- Regulation needs within the BA are likely to continue to grow. DSW is proposing to modify the nameplate assessment by implementing "Variable Multipliers" for intermittent generation. This will help us better align beneficiaries and payment responsibilities.

Variable Multiplier

- Western has developed a Regulation Analysis tool that allows us to determine the hourly impacts of both load and intermittent generation (wind and solar) on the BA.
  - The difference between the impacts of the load and the impacts of the intermittent is the “Variable Multiplier”. Use of this tool on an annual basis will enable us to more accurately assign the costs of regulating capacity based on the relative contributions to the need for the service.

- At this time WALC doesn’t have any solar or wind so for purposes of the rate schedule, the solar/wind variable multiplier will remain 1.00 until the tool indicates a different variable.

Variable Resource Methodology

- The tool and process was used to determine if Variable resources, as a group, consumes a disproportionate amount of regulation and following resources when compared to load and traditional generators.
  - The data used was from Western's Historian with one minute intervals for each sample. Erroneous data was removed.

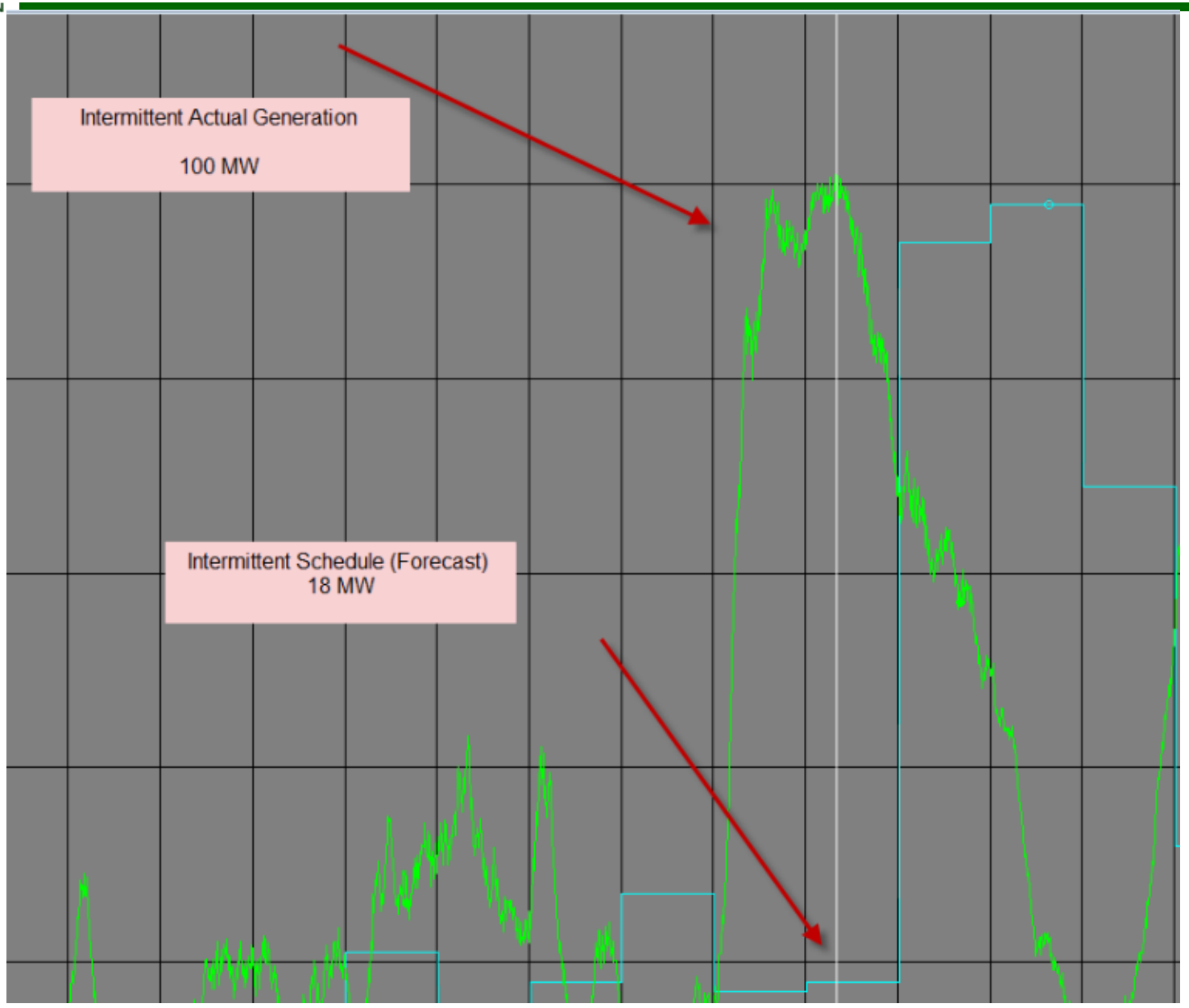
- This was done using a few steps:
  - Determine an "event", based on ACE, removing Frequency and Contingency Reserve events.
  - Analyze the movement of regulation generation in the BA.
  - Determine what resource caused the movement, load, traditional generation, or VER generation.
  - Determine the ratio by which traditional resources (Load and Gen) moved versus VER.

Variable Resource Methodology cont'd

- An event is captured as the control signal increases or decreases in response to the regulating generation and ends when the control signal changes direction.
  - The change of the control signal during the event is then recorded by magnitude and duration.
  - This is done for both load changes and variable generation changes.

- A calculation of load is used based on generation and actual interchange at the BA TIE points.

Example of VER resource strains



VER Assessment Tool results screenshot

	Up Regulation / Following		Down Regulation / Following	
	committed			
MW	75	75	75	75
	WIND	LOAD	WIND	LOAD
avg wind % reg event	15.0%	85.0%	14.3%	85.7%
MW per category	11.261	63.739	10.719	64.281
nameplate & BA load	210.000	2783.000	210.000	2783.000
	0.054	0.023	0.051	0.023
Ratio :	2.341		2.210	
		2.276		

VER Regulation – other options studied

- Before the development of the Regulation Analysis tool, looked into other services/methods that could help solve regulation/following issues. One that looked promising was PSCo's new "flex reserve", used to recover the costs of supplemental reserves needed to address large reductions of online wind generation due to loss of wind speed.
  - FERC has accepted PSCo's plan to charge different rates for load, VER generation and non-VER generation, finding that the provisions are similar to another proposal accepted by the agency.
  - FERC said PSCo showed that VERs, non-VERs and load require the use of reserves in different ways, and they therefore should pay different rates reflecting their relative contributions to the need for the service.

VER Regulation – other options studied

- After much discussion, it was decided not to pursue these different types of services and instead just modify our existing FERC approved charging methodology.
  - Gets us closer to un-socializing the costs without the complications of creating a whole new service.
  - Eliminates complications introduced by not wanting to charge for Following if someone had to ramp due to RMRG events under a “use” type rate.

Regulation Rate Design

- Revenue requirement (numerator) includes:
  - Plant, operation and maintenance costs of regulating units (Amount of required regulation capacity to be re-evaluated every year).
  - Additional costs to support Regulation:
    - Purchases of a regulation product
    - Power purchases needed in support of the units' ability to regulate
    - Any third-party transmission costs associated with regulating.
- Denominator includes:
  - BA load requiring regulation, including load served by Federal allocations, plus installed nameplate of intermittent resources serving load inside WALC.
    - Proposal to include the variable multipliers to the nameplate of intermittent resources serving load inside WALC.

Regulation Formula

Formula

$$\text{Regulation Service Rate} = \frac{\text{Total Annual Revenue Requirement for Regulation Service}}{\begin{array}{c}\text{Load inside WALC Requiring Regulation Service} \\ + \\ \text{Installed Nameplate of Intermittent Generators serving load } \underline{\textit{inside}} \text{ WALC} \\ \text{X} \\ \text{the applicable Wind/Solar Variable Multiplier}\end{array}}$$

- Load is a peak calculation of loads inside WALC taking the service).
- Variable Multipliers will be re-evaluated on an annual basis.

Rate Impacts

Example w/o multiplier:

Regulation Service Rate = $\frac{\$\ 2{,}346{,}192}{1{,}209{,}895\text{kW}\ (\text{w/o variable multiplier})}$

= **$ .1616/ kW-month**

Rate Impacts

Example including hypothetical 100MW of VER:

Regulation Service Rate	**=**	**2,346,192 / 1,309,895kW**
Regulation Service Rate	**=**	**$.149 / kW-month**

Rate Impacts

Example including hypothetical 100MW of VER with Factor of 2:

Regulation		2,346,192
Service	=	1,409,895kW
Rate		$.139/kW-month

Rate Difference

w/o multiplier	=	$.139 / kW-month
w/multiplier	=	$.149 / kW-month
		$.010 / kW-month (≈-7%)

Rate Proposal
Energy/Generator Imbalance Changes

Energy and Generation Imbalance Change

- WALC is proposing a slight change to the ***off-peak*** penalty bandwidths for EI and GI rates
  - Current:
    - EI/GI Bandwidth = +7.5% to -3%; 2MW minimum for over-delivery; 5MW for under-delivery
      - Energy outside bandwidth (under-delivery) 110% return (10% penalty)
      - Energy outside bandwidth (over-delivery) 60% return (40% penalty)
  - Proposal: match off-peak ***bandwidths*** to on-peak
    - EI/GI Bandwidth = +/-1.5% or 4MW; no penalty within bandwidth
    - Outside bandwidth, under delivery 10% penalty; over-delivery 25% penalty
    - >+/-7.5% of load or >10MW, under delivery 25% penalty, over-delivery 40% penalty

Energy/Generator Imbalance Penalty Structure

ON PEAK BANDWIDTHS	OFF PEAK BANDWIDTHS
25 % Penalty EI > 7.5% of LOAD OR > 10 MWh	40% Penalty EI > 7.5% of LOAD OR > 10 MWh
EI > 1.5% OF LOAD OR > 4 MWh 10 % Penalty OVER DELIVERY	EI > 1.5% OF LOAD OR > 4 MWh 25 % Penalty OVER DELIVERY
EI >= 1.5% of LOAD OR 4 MWh No Penalty	EI >= 1.5% of LOAD OR 4 MWh No Penalty
No Penalty EI >= -1.5% of LOAD OR -4 MWh	No Penalty EI >= -1.5% of LOAD OR -4 MWh
EI > -1.5% OF LOAD OR > -4 MWh 10 % Penalty UNDER DELIVERY	EI > -1.5% OF LOAD OR > -4 MWh 10 % Penalty UNDER DELIVERY
25 % Penalty EI > -7.5% of LOAD OR > -10 MWh	25 % Penalty EI > -7.5% of LOAD OR > -10 MWh

Rate Proposal
WALC Unreserved Use

WALC Unreserved Use Penalty

- WALC adding New Schedule for Unreserved Use Penalty (Schedule 10 to OATT)
- Currently each transmission rate schedule in DSW/WALC includes penalty language
- Need to ensure consistency across systems and with OATT

WALC Unreserved Use Penalty

- Proposed Structure (consistent with OATT and current penalty language in Intertie Rate Schedule):
- 2X charge for the period of unreserved use, composed of:
  - Base transmission charge
    - Use FERC-defined periods (e.g., no hourly rate)
  - 100% penalty
- No distribution of penalty revenue above the base charge to non-offending customers. Revenue will be returned to all customers via reductions to future transmission revenue requirements.

WALC Ancillary Service Rates with no Proposed Changes

No Changes Proposed

- Scheduling, System Control, and Dispatch
- Reactive Supply and Voltage Control from Generation or Other Sources
- Operating Reserves – Spinning Reserves
- Operating Reserves – Supplemental Reserves
- Network Integration Transmission Service (NITS) for P-DP and Intertie

In Summary

- Transmission Losses
  - New Schedule developed for WALC losses
- Energy Imbalance/Generator Imbalance
  - Revision to penalty bandwidth and structure for off-peak
- Regulation
  - Proposed Use of multiplier for variable generators
- Unreserved Use Penalty
  - Develop single WALC rate schedule for unreserved use, applicable across transmission systems

Next Steps

- Finalize rate designs and prepare documents for public process
- Publish Proposal Federal Register Notice ~February 2016
  - 90 day comment period begins
- Formal Customer Meetings will be held mid to late March 2016
- Consultation and comment period closes ~end of April 2016
  - Written comments must be submitted by the close of the comment period to be considered by Western's in its decision process.
- Publish Final Federal Register Notice ~ September 2016
- Effective date October 1, 2016

Sneak Peak at Preliminary FY 16 Rate Updates
(eff. Oct 2015)

NOT to be confused with
FY 17 Rate Proposals discussed above!

FY16 Rates Remain Under the Existing Approved Formulas

Preliminary Look at FY 16 Rate Updates

THESE ARE ESTIMATES ONLY!

- WALC Ancillary Service Rates
  - SSCD – $16.57 per schedule
  - VAR - $.087/kW-month
  - Regulation - $.1616/kW-month
  - Energy Imbalance – no change
  - Operating Reserves – no change
  - Generator Imbalance –no change

- Customer notification letters will be sent out in early September with the FINAL rates.
- FY16 Rates Remain Under the Existing Approved Formulas, which don't include changes described in previous slides.

Contact Information

Jack Murray
Rates Manager
(602) 605-2442
jmurray@wapa.gov

Jon Aust
AGC Reliability Manager
(970) 461-7354
aust@wapa.gov

For further information relating to these FY 17 rate proposals, visit our website at http://www.wapa.gov/rm/ratesRM/2017/default.htm

Western AREA POWER ADMINISTRATION

Questions?