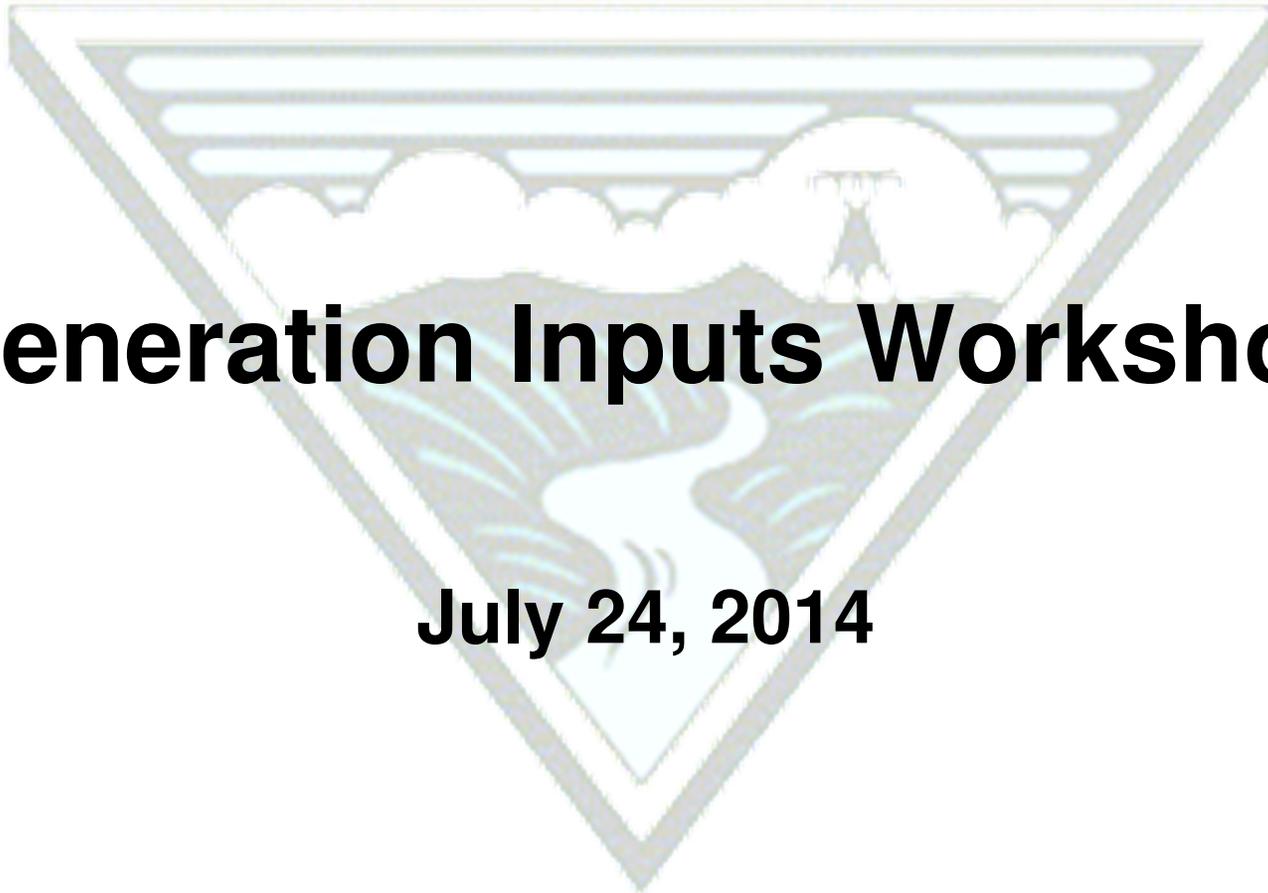


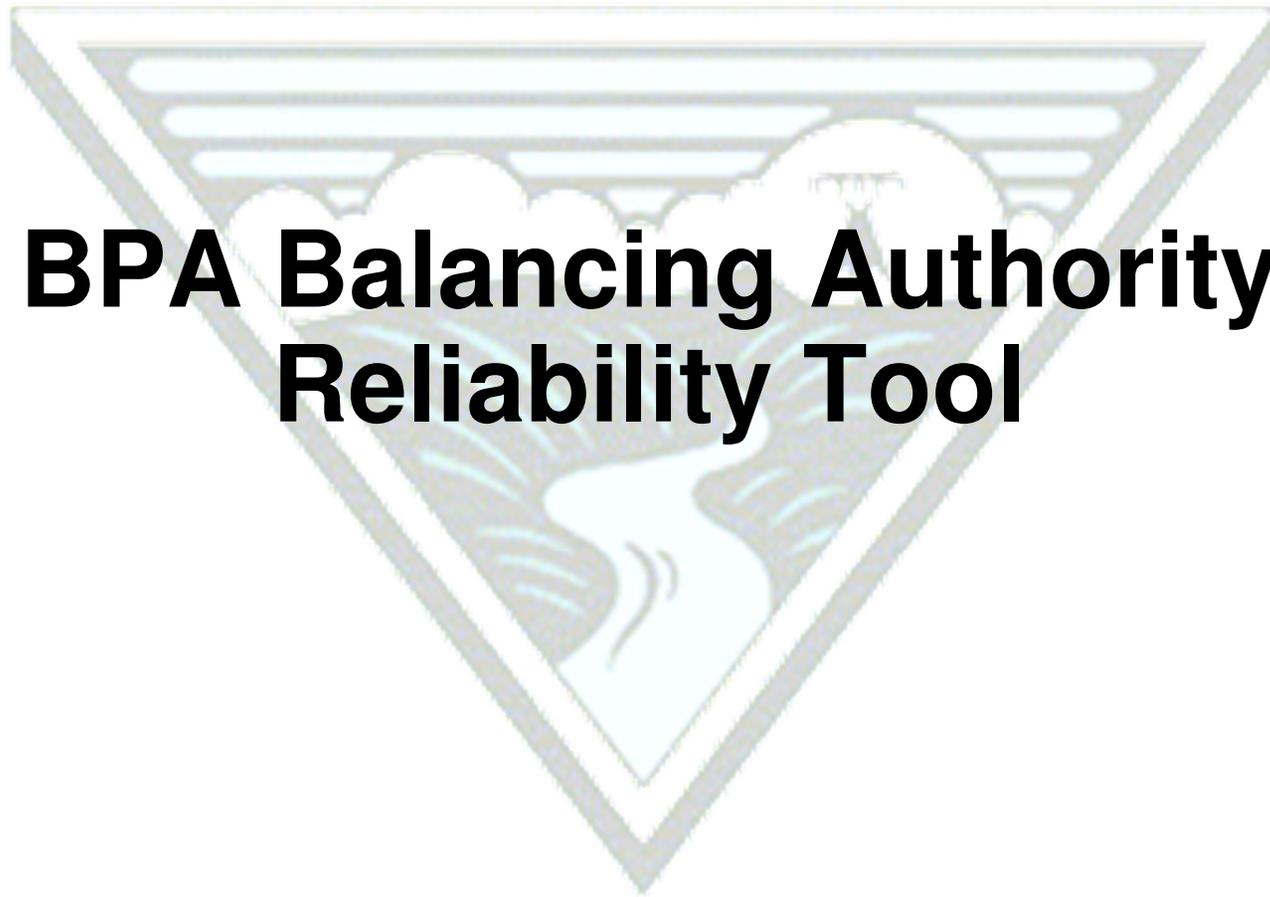
**B O N N E V I L L E**  
P O W E R A D M I N I S T R A T I O N

# **Generation Inputs Workshop**

**July 24, 2014**



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



**BPA Balancing Authority  
Reliability Tool**

## Balancing Authority Reliability Tool

### BA Reliability Tool and System Reliability

- The reliability of the system is at risk if BPA is unable to maintain load and resource balance in the balancing authority area because of extreme generator station control errors (SCE).
- The BA reliability tool is being designed to reduce generation station control error on the system when available balancing reserve capacity is exhausted to prevent the occurrence of a system emergency.
- For example, generation station control error may exceed available balancing reserve capacity from both the Federal system and third parties, as was observed this past Spring.
- During these rare events, BPA must be able to take steps to mitigate adverse impacts to system reliability.



## Balancing Authority Reliability Tool

- Expands operational reliability protocols to all non-controlling generation in the BA.
  - The Big 10 Generation (10 Federal Dams on the Columbia River and lower Snake River) are the excluded units, as they provide the FCRPS balancing reserves.
  - During over-generation events, plants must reduce generation to relieve the reliability event.
  - During under-generation events, schedules (or eTags) are curtailed to relieve the reliability event.
  - For Level 1 events (90% of balancing reserves deployed), reserve allocations are given to generators to allow for deviation from schedule within acceptable ranges.
  - For Level 2 events (currently 100% of balancing reserves deployed),
    - The system must have already recently experienced a Level 1 event.
    - No reserve allocations are given to greater assist the system in getting back to a reliable state.



## Balancing Authority Reliability Tool

- “Netted” groups of plants will be allowed to combine their SCEs and reserve allocations for BA Reliability Tool events.
  - A “netted” group will combine its SCE for diversity benefits and its allocation of reserves for a larger operational deadband.
  - For under-generation (INC) events, when/if the group is subject to a curtailment, the curtailment amount will be a pro-rata curtailment applied across the plants within the netted group who are outside of their INC allocation.
    - For Level 1, this would be the difference between the “netted” group’s basepoints and the “netted” group’s generation plus allocated reserves.
    - For Level 2, this would be the difference between the “netted” group’s basepoints and the “netted” group’s generation.



## Balancing Authority Reliability Tool

- “Netted” groups, continued
  - For over-generation (DEC) events, the “netted” group must keep their combined generation below:
    - For Level 1, this would be the “netted” group’s basepoint (schedules) plus allocated DEC reserves
    - For Level 2 this would be the “netted” group's basepoint (schedules).
  - Any parties who wish to sign a netting agreement together may form a netted group, including different owners/operators and different resource types (VER, DER, etc.).
- Link to existing documentation:  
<http://www.bpa.gov/Projects/Initiatives/Wind/Pages/operational-controls.aspx>



## Balancing Authority Reliability Tool: Under-Generation (INC) Events

- Under-generation events are the times where the BA uses all (or a majority) of its INC balancing reserves due to:
  - Under-generation of non-controlling generation within the BA
  - Over-consumption of loads within the BA
- For under-generation (INC) events, generators will automatically have their schedules (eTags) curtailed by:
  - For Level 1, the difference between their basepoint (sum of schedules) and generation plus allocated INC reserves
  - For Level 2, the difference between their basepoint (sum of schedules) and generation
  - No generator operator action is required.
- It is BPA's intent to apply the under-generation BA Reliability Tool events to all non-controlling generation within the BPA BAA.



## Balancing Authority Reliability Tool: Under-Generation (INC) Events

- Behind-the-Meter Generation will be exempt from BA Reliability Tool Under-Generation (INC) Events, due to these generators:
  - Only serve internal load
  - Do not have eTags to curtail; They submit generation estimates only.
  - BPA would receive no relief from the reliability event by altering their basepoints.
  - These projects amount to 195 MW of thermal generation and 294 MW of hydro generation in the BPA BAA.



## Balancing Authority Reliability Tool: Over-Generation (DEC) Events

- Over-generation events are the times where the BA uses all (or a majority) of its DEC balancing reserves due to:
  - Over-generation of non-controlling generation within the BA
  - Under-consumption of loads within the BA
- For over-generation (DEC) events, generators must keep their generation below:
  - For Level 1, the requirement is the generator's basepoint (sum of schedules) plus allocated DEC reserves
  - For Level 2, the requirement is the generator's basepoint (sum of schedules)
- It is BPA's intent to only apply the over-generation BA Reliability Tool events to variable generation (VER) within the BPA BAA.



## Balancing Authority Reliability Tool: Over-Generation (DEC) Events

- Dispatchable Energy Resources (DER) would not be subject to the Over-Generation (DEC) side of the BA Reliability Tool
  - These include federal non-VER/non-controlling generation, thermal generation and non-federal hydro generation in the BPA BAA.
  - Historical analysis of over-generation events has not revealed DERs as a contributing factor.
  - The two-way communication required to reliably participate in the over-generation side of the BA Reliability Tool is virtually non-existent for DERs.
    - Four existing DER generators in the BPA BAA have this equipment installed.
    - Installation of this equipment poses a significant cost to BPA and the DER resources.
    - A best-case timeline for the design, construction and testing of new two-way communication for all DERs is well beyond the FY 2016-2017 Rate Period.



## Balancing Authority Reliability Tool: Over-Generation (DEC) Events

- Dispatchable Energy Resources (DERs) would not be subject to the Over-Generation (DEC) side of the BA Reliability Tool, continued.
  - DERs are already subject to several rates/costs that incentivize them to decrease generation to schedule.

	Dispatchable Gen (DER)	Variable Gen (VER)
Generation Imbalance Band 3?	Subject to it	Not subject to it
ACS Rate Structure	Use Based Rate	Nameplate Based Flat Fee
Accurate Scheduling Incentive?	Persistent Deviation	Intentional Deviation
PTC/REC Compensation?	No; with minor exceptions for Biomass	Yes; One or Both
Fuel Cost?	Over-gen results in expense	No cost for fuel
Capability of Technology?	Slower Movement (Governor Actions)	Fast Movement (Power Electronics)
Interdependent on other industrial processes?	Yes for Co-Gens	No



## Balancing Authority Reliability Tool Reserve Allocation Example

- Today (July 2014), BPA holds 942 MW of INC Balancing Reserves
  - VER generators are allocated 569 MW of the total
  - Because BPA will not drop load (unless directed by the RC and/or an Energy Emergency Level 3 is reached) and not all generators/loads are going to be off at the same time in the same direction, the remaining 373 MW of INC reserves can get spread among all of the non-VER/non-AGC generation
    - Federal Non-VER Non-AGC Generation = 3467 MW Nameplate
    - Non-Federal Non-VER Non-AGC Generation = 3948 MW Nameplate
  - Non-Federal Non-VER Non-AGC Generation would receive a pro-rata INC allocation of 199 MW =  $373 * 3948 / (3467 + 3948)$
  - Non-Fed Non-VER Non-AGC Generation would receive 199 MW, which would spread out as the greater of 4.75% of nameplate (rounded to the nearest MW) or 1 MW.
    - These generators could opt to form a netted group to potentially shield each other.



## Balancing Authority Reliability Tool

- Sample Curtailment Event #1

Plant	Nameplate	INC Allocation	SCE	Netted INC	Netted SCE	Curtailment
VER 1	100	15	-23	N/A	N/A	-8
VER 2	100	15	-12	N/A	N/A	NONE
VER 3	260	39	-60	N/A	N/A	-21
VER 4	300	15	5	30	-19	NONE
VER 5	100	5	-13			NONE
DER 1	200	10	-11			NONE
DER 2	600	29	-25	N/A	N/A	NONE
DER 3	100	5	-12	N/A	N/A	-7
DER 4	50	2	4	N/A	N/A	NONE



## Balancing Authority Reliability Tool

- Sample Curtailment Event #2

Plant	Nameplate	INC Allocation	SCE	Netted INC	Netted SCE	Curtailment
VER 1	100	15	3	N/A	N/A	NONE
VER 2	100	15	-37	N/A	N/A	-22
VER 3	260	39	-75	N/A	N/A	-36
VER 4	300	15	-17	30	-50	-1
VER 5	100	5	4			NONE
DER 1	200	10	-37			-19
DER 2	600	29	-45	N/A	N/A	-16
DER 3	100	5	13	N/A	N/A	NONE
DER 4	50	2	-5	N/A	N/A	-3



## Balancing Authority Reliability Tool

- BA Reliability Tool Development
  - Design details will be further flushed out in Spring/Early-Summer 2015
  - A customer meeting will be set up to discuss the final draft design and seek customer comment
    - This may be in the form of an JOC meeting, ACS Meeting and/or Rate Case Workshop
  - Implementation will be October 2015.

