

**Arizona Public Service**  
**ETSR Thresholds and NET ITC**

Elizabeth Fa'asamala  
Balancing Authority Supervisor

March 11, 2019



# Agenda

- APS experience with ETSRs
  - System Impacts
  - Examples of initiating events
- ETSR Thresholds
- ETSR Net Inertia Constraint (ITC)

## **Brief Overview of APS**

- Vertically integrated utility in Arizona
- Peak load ~7500 MW
- ~ 1.2 million customers
- Entered the Energy Imbalance Market (EIM) in October 2016
- APS went from decision to market entry in 16 months
- Jointly-Owned Transmission

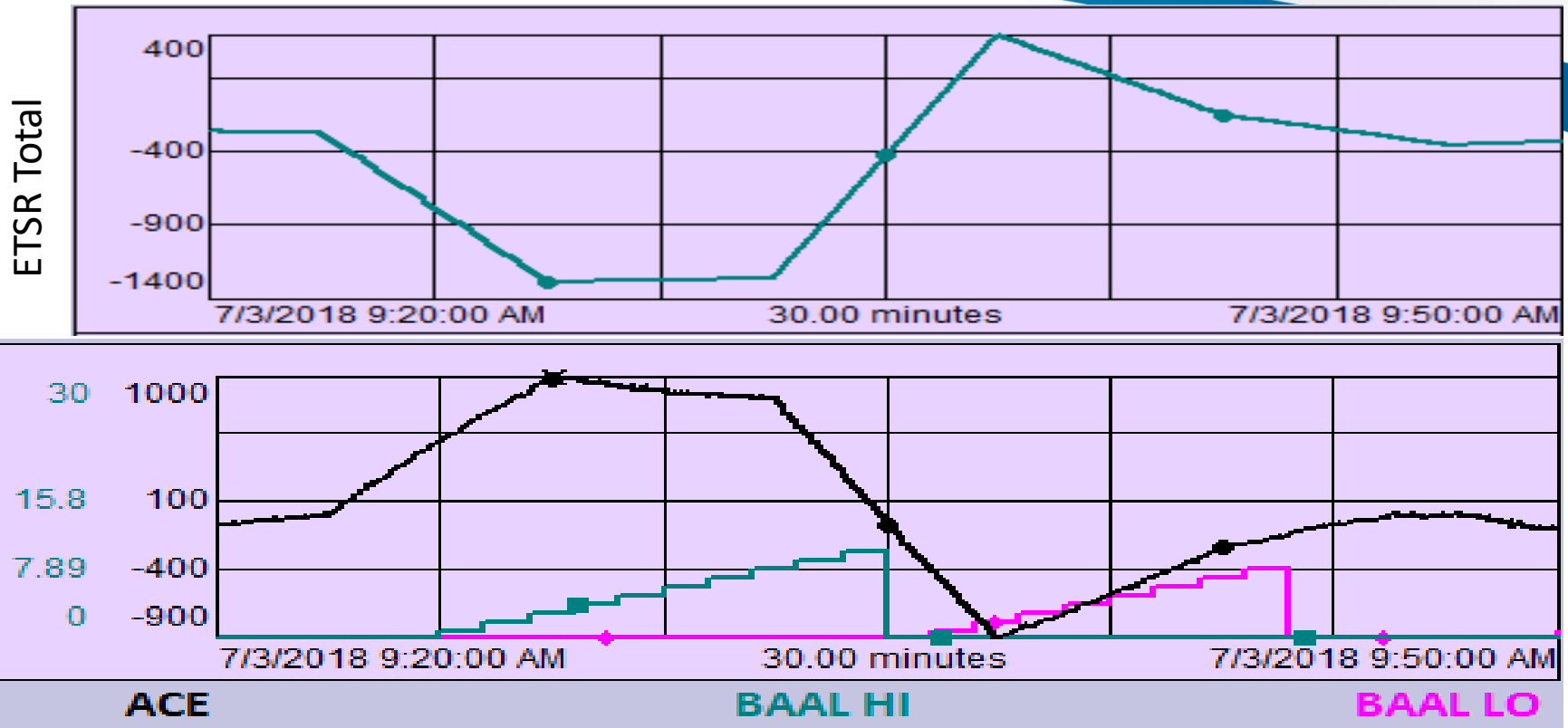
## Brief Overview of APS

- ~600MW rooftop solar
- ~520MW utility scale solar
- Palo Verde Nuclear Generating Station (~4000MW) Operator/Joint-Owner
- Four Corners Generation Station (~1400MW) Operator/Joint-Owner

# APS Experience with ETSRs

- ETSRs:
  - Currently 7 ETSR paths
  - Thousands of MW import/export capability
    - 4327 export (at the moment I typed this slide)
    - 1691 import
  - Provide flow paths between PAC, NVE, and CAISO

# APS Experience with ETSRs

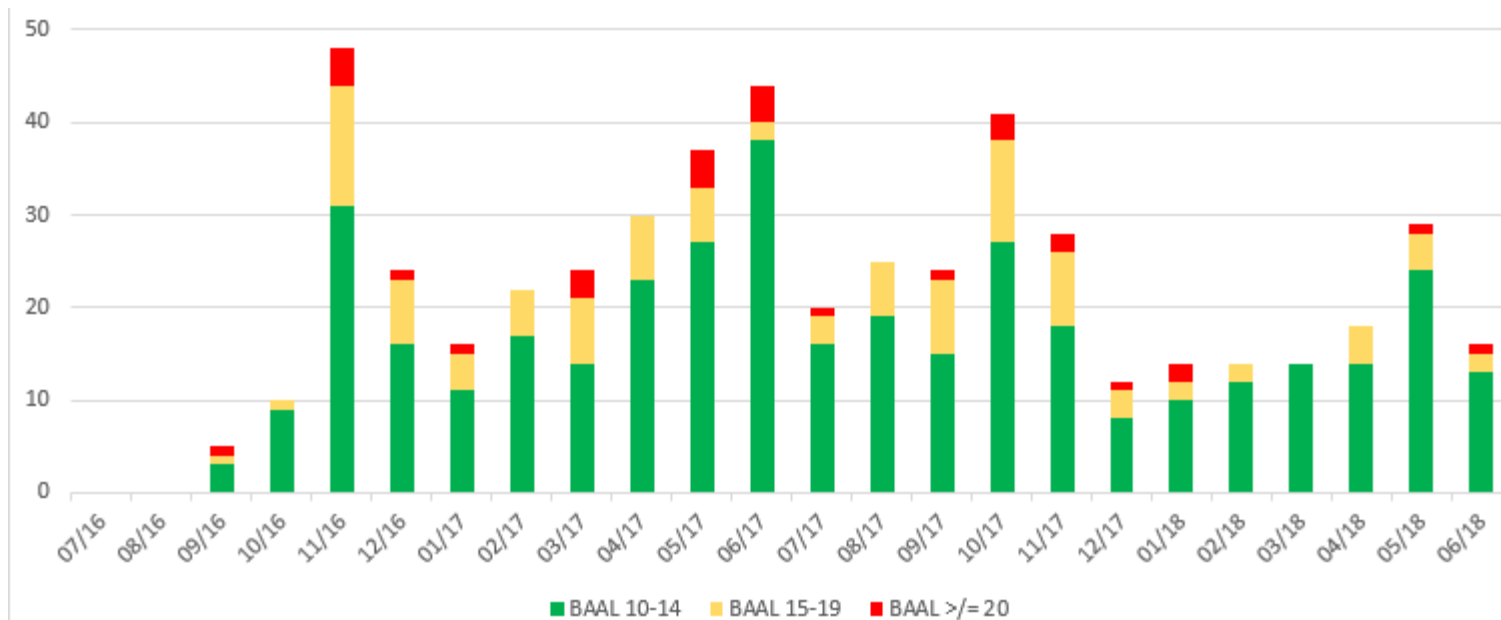


## Historical Causes:

- Momentary/sustained ICCP data issues
- Incorrect Transmission Outage Cards (external & internal)
- Load Forecasting Errors

# System Impact

- ACE Deviations
- BAAL Exceedances
- CPS1 Performance



## **APS Experience with ETSRs**

- On 9/19/17 at 16:11
  - APS Load: 4755
  - ETSR Supplemental Imports: 1578
  - Actual Contingency Reserves: 1145
  - First became concerned that APS could not recover from a loss of ETSRs



## **Solutions**

- Reduce the issues causing ETSR swings
- Prevent large ETSR swings via Thresholds
- Prevent excessive ETSR flow via NET ITC

## Thresholds – What is it

- CAISO implemented the option of Thresholds of all EIM entities.
- The threshold does not impact the market solution.
- If a threshold is met, however, the market will run to previous solution rather than move to the new, unacceptable solution.
- This is available for Generation changes, Intertie changes, and ETSR changes

## Thresholds - Benefits

- Thresholds have to be set at high values to prevent being triggered by normal events; not intended to handle smaller issues
- Prevent large, interconnection-impacting events.

## NET ITC – What is it?

- Allows the market to use us as a conduit for ETSR transfers while limiting our net ETSR transfers
- The market will solve to meet the net ETSR transfer limits set by APS
- Example: Net ETSR export limit set at 100MW
  - ★ Imports of 900 and exports of 1000
  - ★ Imports of 1000 and exports of 800
  - ✘ Imports of 800 and exports of 1000

## NET ITC - Benefits

- Original benefit: Allows us to restrict imports to values we consider manageable while not restricting the rest of the market
- Added benefit: We use when we are experiencing IT issues to help limit ETSR swings
- As we get more and more confident, we will probably use less for its original purpose. The secondary benefit alone has proven very advantageous for us and the rest of the market.

# Recent BAAL Performance

