



Determination of Capacity Value for Advanced Storage Resources

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- These slides outline two possible approaches to determine a capacity value for Advanced Storage Resources.
- Procedure 1 is based on the existing DR model
- Procedure 2 is based on LOLE analysis

Two Categories

- 10 Hour Advanced Storage
 - Capacity Value is total MWh of storage capability/10 hours
- 6 Hour Advanced Storage
 - Capacity Value is total MWh of storage capability/6 hours
 - May be classified as a limited product in the RPM Auction and may receive a lower price than a less limited product

- The Capacity Value of all resources at a given location must be determined as either 10 Hour Advanced Storage or 6 Hour Advanced Storage.
- Multiple resources may be aggregated provided they are of similar design and technology and are electrically similar (of equal capacity values and residing on the same bus).
- The selection is applicable for an entire Delivery Year.
- UCAP value of the resource will be the Capacity Value reduced by an unavailability rate.
- Resource will be required to perform a summer and winter capability test (may use actual operating data).

Net Max Capacity = 10 MW

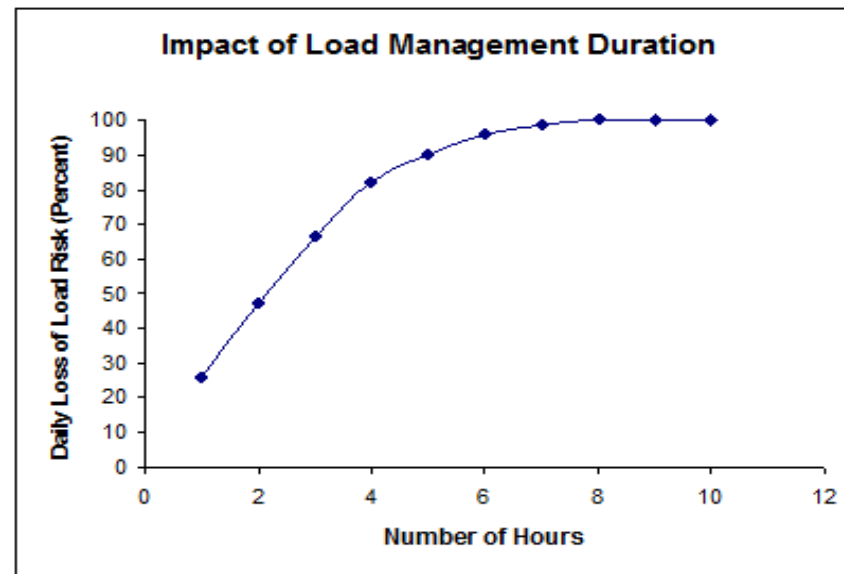
1. Storage: 100 MWh. Max Output Duration = 10 hours. This is a 10 MW "10 Hour Advanced Storage Resource".
2. Storage: 60 MWh. Max Output Duration = 6 hours. This is a 10 MW "6 Hour Advanced Storage Resource". This resource has an option to be offered as a "10 Hour Advanced Storage Resource" at $60/10 = 6$ MW.
3. Storage: 48 MWh. Max Output Duration 4.8 hours. This resource can be:
"6 Hour Advanced Storage Resource" at ICAP value = $48/6 = 8$ MW ;
or
"10 Hour Advanced Storage Resource" at ICAP value = $48/10 = 4.8$ MW.

- Coordinate with PJM Operations and Markets to define dispatch and capacity market rules and energy bidding requirements.
- Develop performance metric to convert from Capacity Value to UCAP Value.
- Draft language for Manual 21: Rules and Procedures for Determination of Generating Capability.

- Same requirements as set forth under Procedure 1 with one change: the capacity value of the resource is based on LOLE analysis of its runtime duration
- Use LOLE tools to calculate the Effective Load Carrying Capability (ELCC) of a resource available for X hours per day every day. (X can be varied from 1 to 6.)
- A Capacity Discount Factor could be calculated for a storage resource based on its runtime duration. The Discount Factor would be equal to $(ELCC/ \text{Rating of resource})$.

* ELCC is the amount of peak load that an incremental resource can serve at an LOLE of one day in ten years.

- Say the LOLE analysis produces the following Discount Factors for various durations:



- A 1 hour duration resource would receive 26% credit, 2 hour would receive 47%, 3 hour 67%, etc.