Energy Storage Participation in RPM

Options Matrix

| Number | Design Components[1] | Priority (high/med/low) | Status Quo | Solution Options[2] | | | | | | |
				A	B	C	D	E	F	G	H
1	Must offer requirement in day ahead market	low/medium	Currently not allowed to bid into capacity market	Self-scheduling	PJM optimization (e.g. pumped hydro)	Standard DA/RT, respecting max run time/max energy limits					
2	Minimum continuous electricity time capability	high	- No current standard - PICA standard obsolete for limited energy resource - 4 hours (based on fuel limited resources) - regulation is hourly market - cannot be out for XX mins or else forfeit bid - dependent on market software	1 hour	keep current products - limited, extended summer consistent with shortest duration of current DR products	10 hours	15 mins/shorter than 1 hour	4 hours		
3	Minimum continuous electricity production capability	low/medium	- Continuous capability for a certain period - 0.1 MW for existing resources	status quo						
4	Test requirements	medium	- 1-2 hours based on resource type, Steam 2 hrs, Hydro 1 hr - Qualifying test - Seasonal test - Equivilant to duration	initial test - CIR, annual/seasonal test qualification test similar to regulation						
5	Metering requirements	low/medium	- As outlined in manual 14D - LM outlined in manual 11 - Energy market in load response manual	Comply with rules in Manual 14D						
6	Method of availability to PJM as a generating resource	medium	- Traditional generators - daily must offer - DR - have to register prior to delivery year - if EO - 20 mins notice, self schedule	energy market must offer obligations						

7	Offer parameters	high	mins/max, startup, emergency min/max, price/cost based, cost curve
			
			1) Beginning and End of Day Storage levels in MW. (INITIAL MW, FINAL MW)
			2) GenMin and PumpMin values, which will be the minimum hourly pumping and generating MW (MIN PUMP MW, MIN GEN MW)
			3) Pumping efficiency (PUMP FACTOR).
			4) Maximum or minimum storage level constraints (MAX MW, MIN MW)
			
			Other parameters for regular resources as well:
			Start up/ shutdown costs
				status quo plus max run time and/or max energy and min charge time
				
				when using pumped hydro parameters, make obvious substitusions:
				    pump/generate -> charge/discharge
				    pumping efficiency -> cycle efficiency
				    etc.						

8	Response and recovery	medium/high								
9	Capacity Value: How to determine UCAP	high	- Discount ICAP based on outage rates, e.g., most gen - UCAP is fraction of ICAP, e.g., intermittent resources - Administratively determined, e.g., Energy Efficiency - Inferior product with limited clearing and price separation, e.g., sub-Annual DR.	Calculation based on load carying capabilty at constant LOLE	ICAP derated by forced outages	actual output over series of peak hours (eg. Wind model)	average hourly output over req cont operation hourly req		
10	Applicability: what types of resources rules apply to	medium/high	- PS - submit day ahead, schedule, blackstart level, never fully depleted - battery would never deplete due to degradation compared to PS							
11	Scheduling method	low/medium								
12	Cost Based Offer Cap	high								
13	Emergency Procedures Obligations	medium								
14	Performance Assessment	high	- Seasonal verification test - EFORd and EFORp performance - DR compliance check - MMV for energy efficiency							
15	Settlements/Penalties	high								
16	Immature resources/transition mechanisms for determining capacity value	medium/high								

Directions:

[1]Design Components - each is an "attribute" or "component" of any proposed solution. Consensus of the group should be sought on selection of a set of solution criteria.

[2]Solution Options - each is a solution alternative elicited from the stakeholder group that meet one of the specific solution criteria.

To complete the matrix:

1. Elicit from the stakeholder group a set of components (attributes) desired for any proposed solution. Enter a short label for each in the Design Components column.

2. If needed, enter a more detailed description of each criteria on the "Component Details" tab.

3. Using informal/non-binding voting, rate each component's priority in the final solution as "high/medium/low"

4. Elicit from the stakeholder group potential solution alternative(s) for each component. Enter a short label for each in the Solution Options columns.

5. If needed, enter a more detailed description of each potential solution option on the "Solution Details" tab.

6. Once the matrix is filled out, the group will attempt to select a single solution alternative (column) for each component (row) to form a solution "package".
   Example: cells 1B, 2C, 3A, 4B, 5D could make up a solution package.

7. If consensus is achieved on a single package (Tier 1 decision-making method), this will be documented in a Consensus Proposal Report to the parent committee.

8. If not, the group will identify up to 3 possible solution packages in a comparative Proposal Alternatives Report to the parent committee (Tier 2 decision-making method).