Reserve MW Effective Time and Performance Measure Rules

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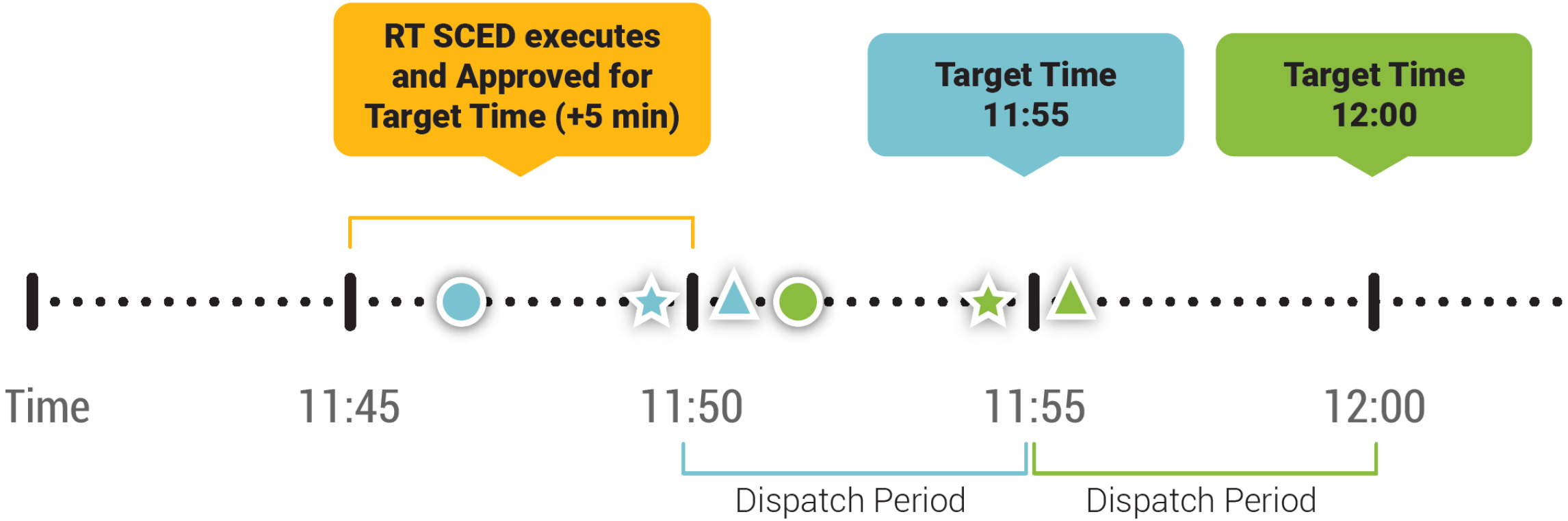
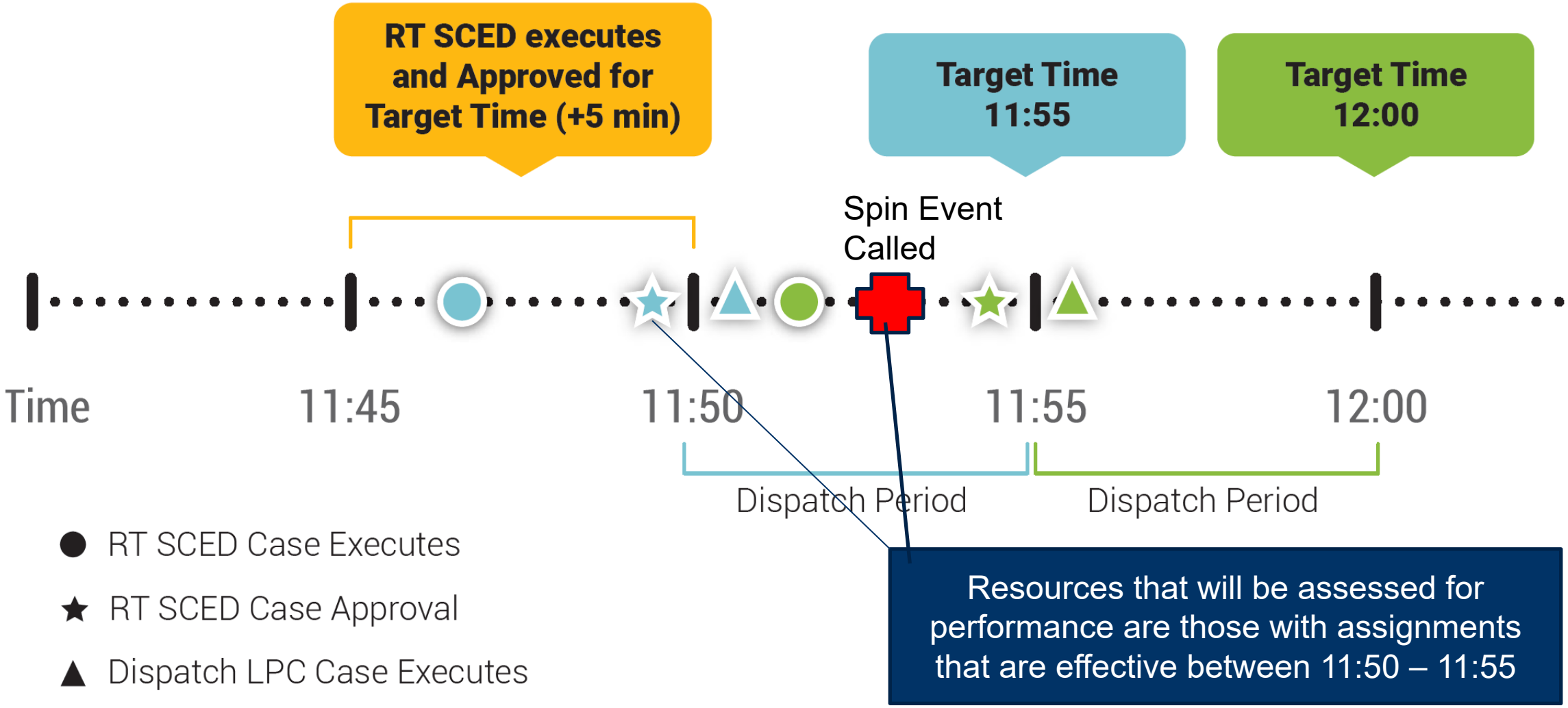
Overview

- Purpose
  - Provide a high-level understanding of the real-time Synchronized Reserve commitment timeline, duration of commitment obligation, and performance validation
- Key Takeaways
  - Effective RT SR MW at the start of a Spin Event
  - Scenario of capped and uncapped SR RT MW

RTSCED Case Sequence



RTSCED Case Sequence



Resource Reserve Assignment Timeline

- Key Takeaway
  - PJM considers the assignment for the 11:55 SCED case to be effective from 11:50 - 11:55.

RT SR MW Assignment – Some Examples

Flexible SR & No Ramp Constraint | Approved SR Max < Eco Max

Energy + AS ≤ Min [Eco Max, SR Max]

Eco Min = 404 MW

Eco Max = 875 MW

SR Max = 865 MW

Parameters	Scenario 1	Scenario 2	Scenario 3
SE MW	820	860	870
Target MW	850	870	837
SR MW	15	0	28

Key Takeaway	**Resource may be considered for reserve** when the target energy MW is below SR Max	**No reserve consideration** when the target MW is above SR Max	**Reserve MW materializes at the target MW:** *For a downward dispatch, potential issue exist if Spin Event is called before energy target time or if unit is not following dispatch*

Capped & Uncapped Synch Reserve MW

- M28 Section 6.2.2
  - If no Synch Reserve event occurs, RT SR MW used in settlement is capped at the amount of reserves the resource actually could have provided based its on real-time energy output.
    - min {RT SR MW, max[(min(EcoMax,SRMax) – RT MW), 0]}
  - If Synch Reserve event occurs, SR MW used in settlement is uncapped. The full RT SR MW assignment is used in settlements and performance assessment.
- Resources are measured for performance based the net MW change before (-1, 1 min) and after (9, 11 min) the event and compared to the RT SR MW
  - No consideration for available headroom or ramp rate constraints from the discrete dispatch instruction

Capped & Uncapped RT SR MW - Example

EcoMax = 100 MW	SRMax = 100 MW
SE MW = 100	Target MW = 90
RT SR MW = 10	RT MW = 95

Scenario	**No Spin Event**	**Spin Event**
Settlement Credit (SR MW)	5 MW	10 MW then claw back 5 MW of non-compliance

RT SR MW Obligation & Assessment

- Key Takeaways

1. Only resources with RT SR MW in effect at the start of spin event are obligated to respond and are measured for compliance if the event lasted for 10 minutes or longer.

2. All performance assessments are evaluated against the RT SR MW, no other considerations in the evaluation today.

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Acronyms

Acronym	Term & Definition
RT SCED	**Real-Time Security Constrained Economic Dispatch** is the application responsible for dispatching resources in real-time for a target five minute interval as a result of a co-optimization of Energy and Reserves for the forecasted system conditions.
Synchronized Reserve Maximum (SR Max)	**SR Max** is the highest incremental MW output level that a unit can reliably achieve while providing Synchronized Reserve.
Economic Maximum (EcoMax)	**EcoMax** is the highest incremental MW output level that a unit can reliably achieve while providing Energy.
Synchronized Reserve (SR)	**SR** is from resources that are electrically synchronized to the system, with the capability to be converted fully into energy within 10 minutes or customer load that can be removed from the system within 10 minutes of the request from the PJM dispatcher
Real-Time Synchronized Reserve Assigned MW (RT SR MW)	**RT SR MW** is the Real-Time Synchronized Reserve megawatt assigned to a resource and expected to be converted fully into energy within 10 minutes (for generator) or load that can be removed from the system within 10 minutes (Economic Load Response) of the request from the PJM dispatcher

PJM Glossary

Acronyms

Acronym	Term & Definition
State Estimator MW or Initial MW (SE MW)	**SE MW** is the State Estimator megawatt.
RTSCED Target MW	**Target MW** is the expected megawatt output of a resource at the interval target time.
Real-Time MW (RT MW)	**RT MW** is the megawatt output of a resource at a moment in time.

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