



Dispatch Operations in Emergency Reserve Events

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Synchronous Reserve Deployment Task Force

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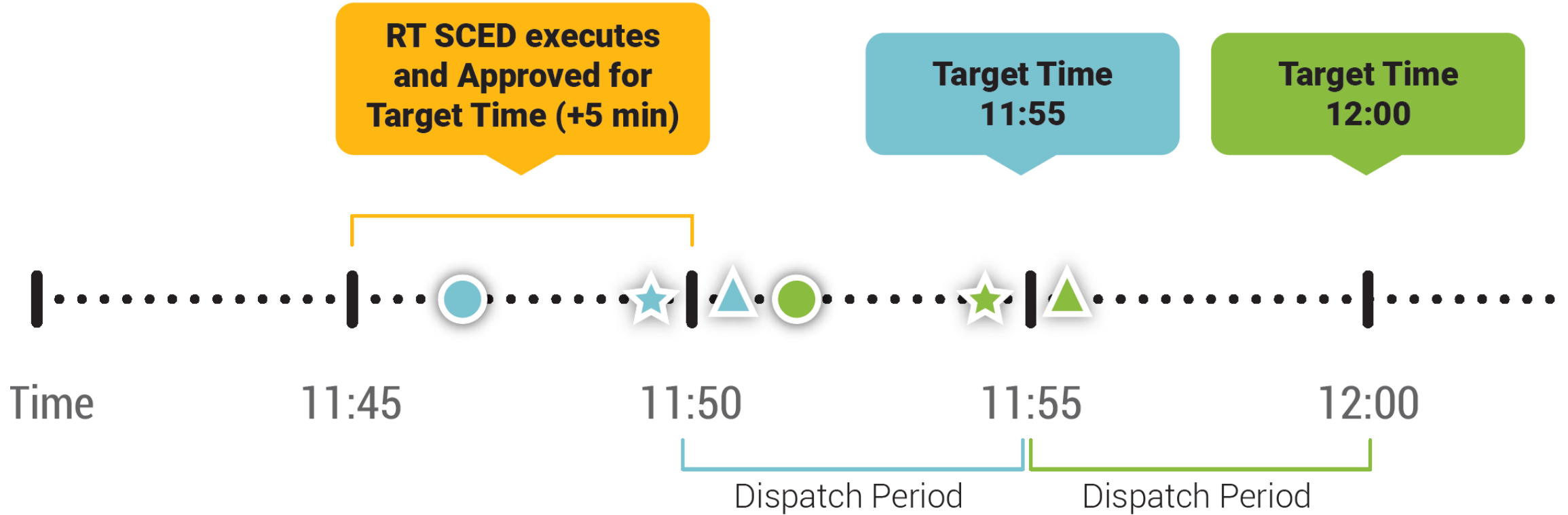
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- PJM Compliance Requirements
 - Internal (10 min)
 - NERC (15 min)
- Reliability (maintain system frequency, balance load/gen)
- Length of emergency event varies



Recap Inputs into RTSCED Engine and Frequency

Inputs Used	Description	Frequency
Bid Data	Latest Participant Bid data (eco-limits, hour offer curves)	1 Minute
EMS Data	Latest State Estimator run, Constraint specific Distribution Factors and Loss Penalty Factor	~2 Minutes
Load Forecast	RT SCED uses Neural Net Load Forecast (VSTLF). It is a rolling 6 hours into the future and is updated every 5 minutes	5 Minutes
Reg/Spin	Current Regulation/Spin assignments	Available Each case execution
Interchange	Energy Schedules	5 Minutes
Load Bias	Bias utilization is based on actual load, actual interchange, and the actual performance/availability of generation resources	Ad hoc
Operator specific Inputs	Hydro Schedules, Constraint Control %,Marginal Value Limit Overrides	Ad hoc



- RT SCED Case Executes
- ★ RT SCED Case Approval
- ▲ Dispatch LPC Case Executes



Review Proposed Market Case Timing

Interval	11_11	11_12	12_01	12_02	12_03	12_04	12_05	12_06	12_07	12_08	12_09	12_10	12_11	12_12
RTSCED Execute	11:46:00	11:51:00	11:56:00	12:01:00	12:06:00	12:11:00	12:16:00	12:21:00	12:26:00	12:31:00	12:36:00	12:41:00	12:46:00	12:51:00
RTSCED Approve	11:49:50	11:54:50	11:59:50	12:04:50	12:09:50	12:14:50	12:19:50	12:24:50	12:29:50	12:34:50	12:39:50	12:44:50	12:49:50	12:54:50
RTSCED Target Time	11:55:00	11:59:59	12:05:00	12:10:00	12:15:00	12:20:00	12:25:00	12:30:00	12:35:00	12:40:00	12:45:00	12:50:00	12:55:00	12:59:59
LPC Pricing Execution	11:50:10	11:55:10	12:00:10	12:05:10	12:10:10	12:15:10	12:20:10	12:25:10	12:30:10	12:35:10	12:40:10	12:45:10	12:50:10	12:55:10
Flexible Tier2 Effective	11:50:00	11:55:00	12:00:00	12:05:00	12:10:00	12:15:00	12:20:00	12:25:00	12:30:00	12:35:00	12:40:00	12:45:00	12:50:00	12:55:00
Flexible Tier2 Termination	11:55:00	11:59:59	12:05:00	12:10:00	12:15:00	12:20:00	12:25:00	12:30:00	12:35:00	12:40:00	12:45:00	12:50:00	12:55:00	12:59:59

1. Event Occurs
 - Regulation depleted (if available) (**regulation is not reserves**)
 - ACE decreases
 - Frequency may decline
2. Event identified
 - Confirm loss of unit (action required)
3. Action(s) taken immediately (no waiting)
4. ACE Recovers and stabilizes for normal operations

- Other RTOs/ISOs have automated reserve deployment
- Deployment systems are ready to go or available shortly after event
- Fundamental differences in reserve treatment across RTOs/ISOs compared to PJM

- PJM Requirement at risk
- NERC Compliance at risk
- Overall system degraded condition
 - Unable to determine length of spin event
 - Additional risk of loss of next Unit
- May require additional emergency procedures
 - Shared reserves
 - Voltage Reduction
 - Shed Load

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