# Tracking Ramp Limit Desired Metric Examples

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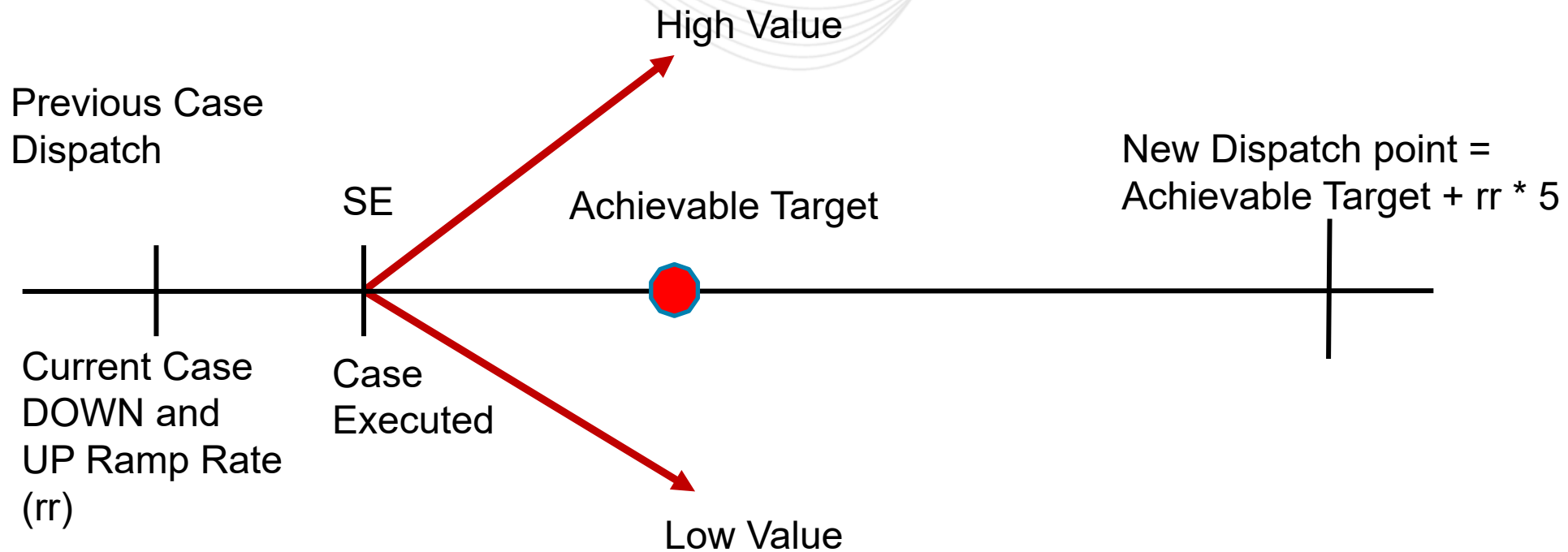
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- Generically, the new metric is calculated as:

  - $D_t = D_{t-1} +/- Ramp_t$

- Where:

  - D = New Desired MW

  - t = Calculation interval. When t-1 = 0, D = Actual Output.

  - *Ramp = Increase/decrease in output based on market conditions. The ramp will be calculated using the dispatch LMPs solved in every RTSCED case and the ramp rates submitted by the units.*
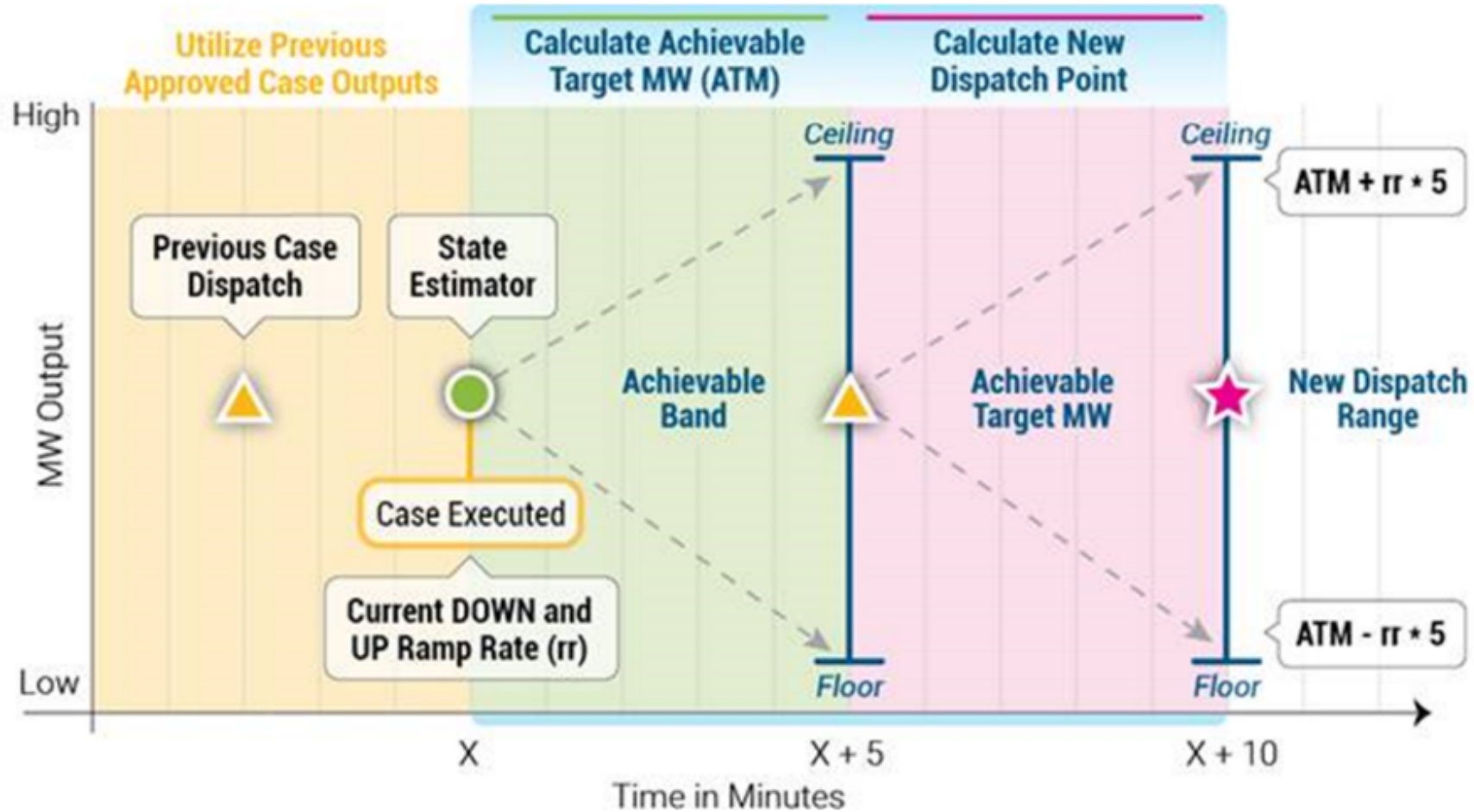
The RTSCED dispatch point is generally the previous case dispatch ramped over 5 minutes

High Value

Previous Case
Dispatch

SE

Achievable Target

New Dispatch point =
Achievable Target + rr * 5

Current Case
DOWN and
UP Ramp Rate
(rr)

Case
Executed

Low Value

$$Achievable\ Target\ MW = Min(Max(previous\ Case\ Dispatch,\ (SE\ MW - (current\ down\ ramp\ rate)*5)),\ (SE\ MW + (current\ up\ ramp\ rate)*5)))$$
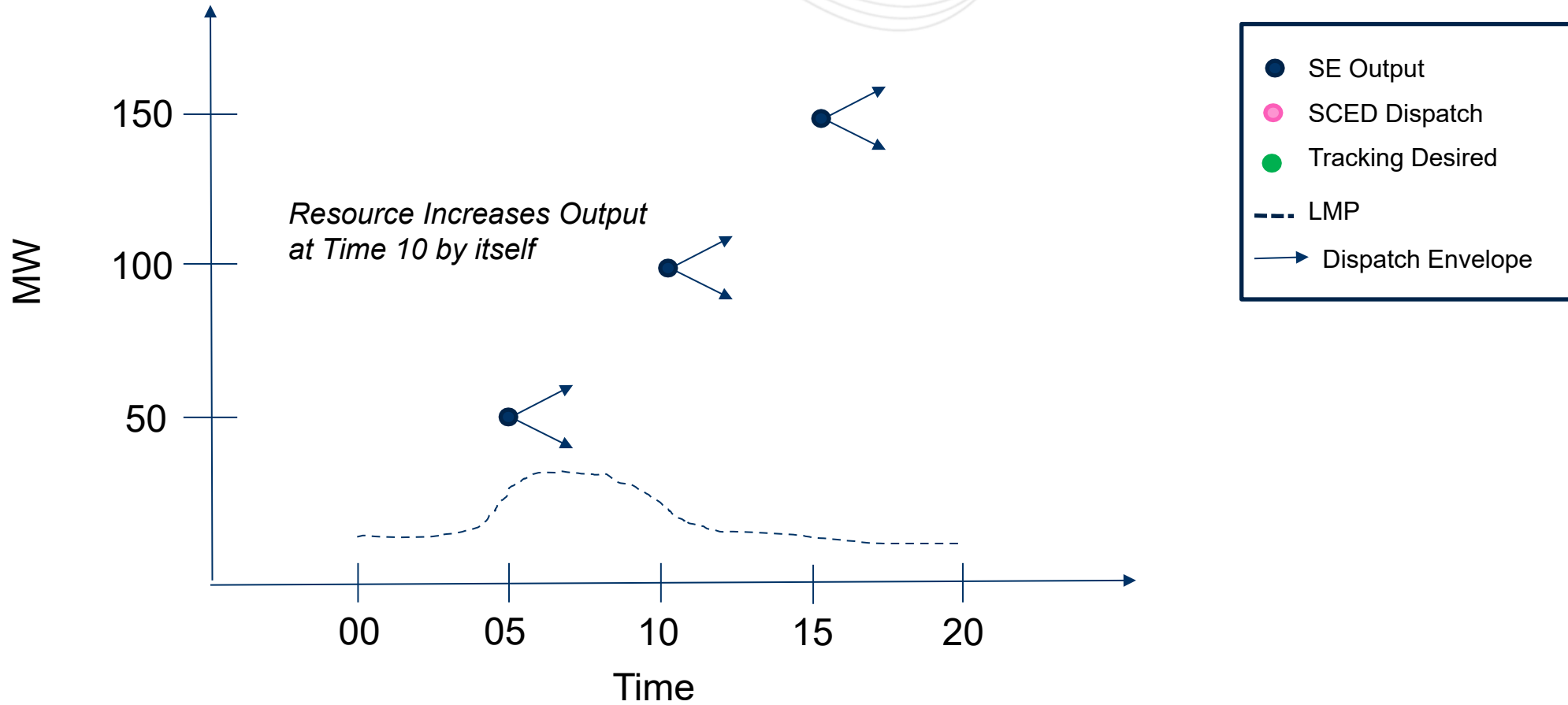
Previous Case Dispatch = 70

Previous Case Dispatch = 80

Previous Case Dispatch = 90
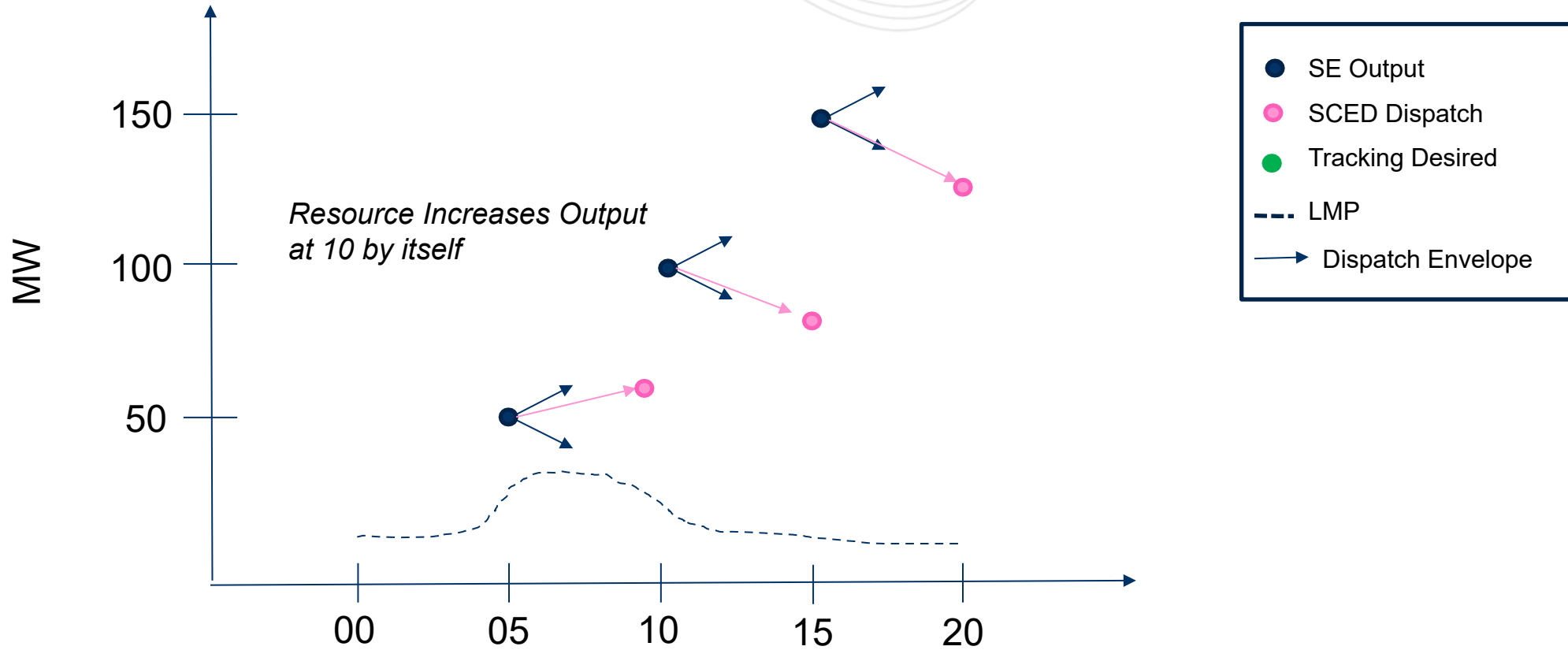
Previous Case Dispatch = 100

Previous Case Dispatch = 110

SE = 71

SE = 82

SE = 92

SE = 102

SE = 112

ATM = Min(max(70,61),81)= 70

New Dispatch ATM + 10 = 80

ATM = Min(max(80,72),92) = 80

New Dispatch = 90

ATM = Min(max(90,82),102) = 90

New Dispatch = 100

ATM = Min(max(100,92),112) = 100

New Dispatch = 110

Resource Increases Output at Time 10 by itself

Legend:
- SE Output
- SCED Dispatch
- Tracking Desired
- LMP
- Dispatch Envelope

MW

150

100

50

00   05   10   15   20

Time

Key Take Away: Although LMP is decreasing in minutes 10 and 15, SCED is limited in how far down it can send the unit because the resource is increasing its output and adjusting the envelope upward

Resource Increases Output at 10 by itself

Legend:
- ● SE Output
- ● SCED Dispatch
- ● Tracking Desired
- --- LMP
- → Dispatch Envelope

Key Take Away: Tracking Desired is not influenced by the resource's deviation from the prior dispatch signal and therefore does a better job of reflecting what MW would have been desired if the unit had been following dispatch over time
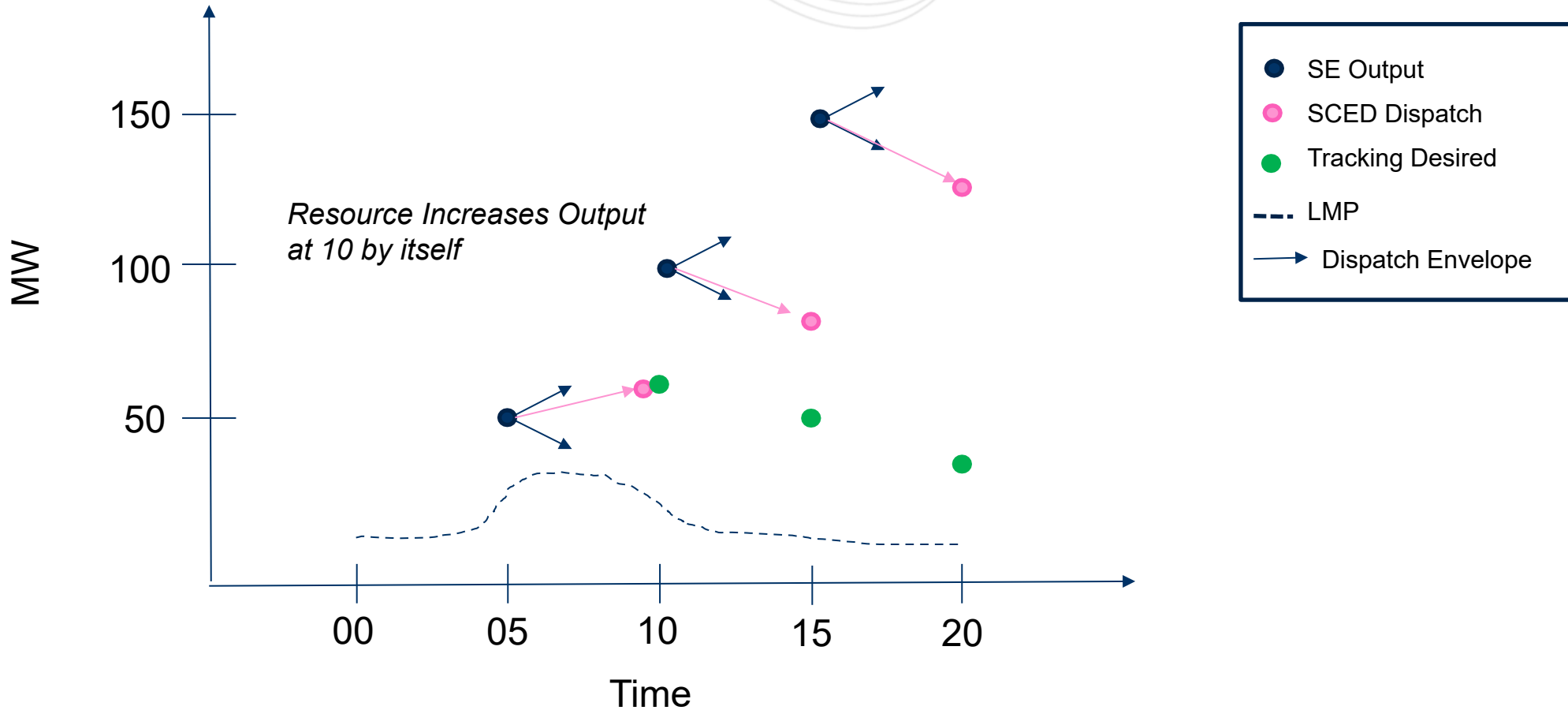
Definitions	Description
SE MW	State Estimator value from the EMS snap shot at the time of the RTSCED execution
Achievable Target MW LOW	Low side of Envelope calculation (SE- current down ramp rate *5)
Achievable Target MW HIGH	High side of Envelope calculation (SE+ current down ramp rate *5)
Achievable Target MW	Achievable Target MW calculated within the envelope (ATM = MIN(MAX(Previous Case Dispatch, ATM LOW)), ATM HIGH))
LMP	Location Marginal Price as calculated at the bus
SCED MW	RT SCED Dispatch Signal
Actual RT MW	Revenue Grade telemetry submitted in Power Meter
Tracking Desired	New metric that measures how closely a resource is following dispatch over time by considering ramping limitations and LMP
Delta Actual vs. Tracking Desired	The difference between Power Meter data and Tracking Desired values
LMP Desired	The LMP Desired is the MW level on the incremental offer curve where the Dispatch Run LMP intersects the offer curve. Not a ramp-limited value
Ramp Limit Desired	The MW value that the unit should have achieved between Dispatch Signals or RT SCED case approvals.
Delta Actual vs. Ramp Limit Desired	The difference between Power Meter data and Ramp Limit Desired values

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Potential Solution Options – Desired MW Calculations

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