Following Dispatch
and
Uplift Eligibility

MIC

April 13, 2022

IMM

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Uplift

- **Uplift payments are made to units that operate as directed by PJM.**

- **Goal is to ensure that units recover their costs (offers) when they operate at PJM's direction, and energy and ancillary market revenues do not cover offers.**

- **Goal is to provide incentive to follow PJM's direction.**

Uplift Eligibility and Dispatch Requirements

- **All pool-scheduled resources are eligible for uplift payments if they operate as requested by PJM. OA Schedule 1 Section 3.2.3 (e).**

- **PJM has the authority to direct any Market Seller to adjust the output of any pool-scheduled resource. OA Schedule 1 Section 1.11.1.**

- **Generators must be able to follow PJM's dispatch instructions based on the submitted ramp rate. OA Schedule 1 Section 1.7.19.**

- **Generators must respond to PJM's directives to start, shutdown or change output levels. OA Schedule 1 Section 1.7.20.(b).**

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Uplift Eligibility Issues

- **PJM does not have an accurate metric to define whether a resource follows PJM's direction.**

- **PJM does not have a consistent process to determine whether a resource follows PJM's direction.**

- **As a result, PJM does not accurately determine eligibility for uplift payments.**

- **PJM's approach results in the payment of uplift to units that are not following dispatch and are therefore ineligible to receive uplift payments.**

- **PJM's approach results in an incentive for inflexible operation rather than flexible operation.**

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Uplift Issues: Logs

- **PJM relies heavily on dispatchers' log for uplift eligibility.**

- **Dispatchers typically log units as running for PJM (eligible for uplift) or running for company (ineligible for uplift).**

- **Units running for PJM are assumed to follow dispatch.**

  - **If dispatchers identify that a unit running for PJM is not following dispatch, a conversation may occur in order to: make the unit follow dispatch; or log the unit as running for company.**

  - **This is an inefficient and incomplete method for identifying units not eligible to receive uplift**

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Uplift Issues: CTs

- CTs are deemed to always follow dispatch, by definition.

- As a result, CTs are paid uplift based on actual generation, regardless of following dispatch.

- This approach is based on pre CP rules. Prior to CP, CTs were not required to have a dispatchable range.

- Under CP, all industrial/frame CTs are required to have a dispatchable range. (CT PLS includes a 1.5 turn down ratio (ratio of eco max to eco min).

- Current approach creates an incentive to not follow dispatch.

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Uplift Issues: Commitment Times

- **PJM does not have an automated process for defining and communicating the time at which a real-time commitment begins or ends.**

- **There is also no standard process for defining if a resource, whether committed day-ahead or real-time, comes online too early or remains online too long.**

- **Defined online, offline, and commitment times are necessary for determining if a resource is following PJM's instructions.**

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Uplift Issues: Fixed Gen

- **Units offer and operate using the Fixed Gen flag in Markets Gateway.**

- **The Markets Gateway User Guide defines the Fixed Gen flag as a field that "should be set to yes if a generation resource intends to remain fixed or otherwise not follow PJM real-time dispatch."**

- **Fixed Gen units should not be eligible to receive uplift payments because they are not following dispatch, unless block loading specifically authorized.**

- **PJM pays uplift to these units.**

- **This provides an incentive to not follow dispatch.**

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Uplift Issues: Slow Units

- **Steam units, even when logged as following dispatch, are paid uplift for actual generation when actual generation is within 20 percent of dispatch.**

- **Steam units are made whole to LMP Desired MW when actual generation is not within 20 percent of dispatch.**
  - **Pays less to fast ramping units than to slow ramping units.**
  - **Incentive to be inflexible.**

- **Steam units with slow ramp rates are generally within 20 percent of dispatch.**

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Uplift Issues: Slow Units

- **Flexible CC**

Eco Max = 200 MW

Eco Min = 100 MW

Ramp Rate = 10 MW/min

Current MW = 200 MW

Dispatch Signal = 150 MW

LMP Desired MW = 100 MW

Unit does not follow, stays at 200 MW

Deviation = 200/150 -1 = 33%

Unit is made whole to LMP Desired MW (100 MW)

- **Inflexible ST**

Eco Max = 200 MW

Eco Min = 100 MW

Ramp Rate = 1 MW/min

Current MW = 200 MW

Dispatch Signal = 195 MW

LMP Desired MW = 100 MW

Unit does not follow, stays at 200 MW

Deviation = 200/195 -1 = 3%

Unit is made whole to actual (200 MW)

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IMM Requests for Resettlements

- **The IMM notifies PJM and/or market sellers of instances in which units did not operate as requested by PJM.**

- **Some Market Sellers argue that PJM's uplift payment means that the units were following dispatch.**

- **Some Market Sellers acknowledge their units did not follow dispatch and agree that the uplift payment should be repaid.**

  - **PJM did resettle several instances in recent years.**

  - **But PJM has refused to accept most such repayments of incorrect uplift payments in recent years**

  - **PJM argues that the tariff does not allow it to resettle.**

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Examples of Problem

- **Two CTs and two STs.**

- **CTs' ramp rates make them capable of moving between max and min between SCED signals**

- **STs have slow ramp rates. In every SCED dispatch instruction, the units are asked to ramp down by a small amount. As a result, the units should operate close to min.**

  - **The IMM calculated the MW level the unit should have achieved (Achievable MW) if it had followed all the dispatch signals. (For steam units.)**

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Dispatch Signal Background

- **On Nov 1, 2022, PJM implemented the long term SCED design changes.**

- **The dispatch signal is now calculated taking into account the previous dispatch signal.**

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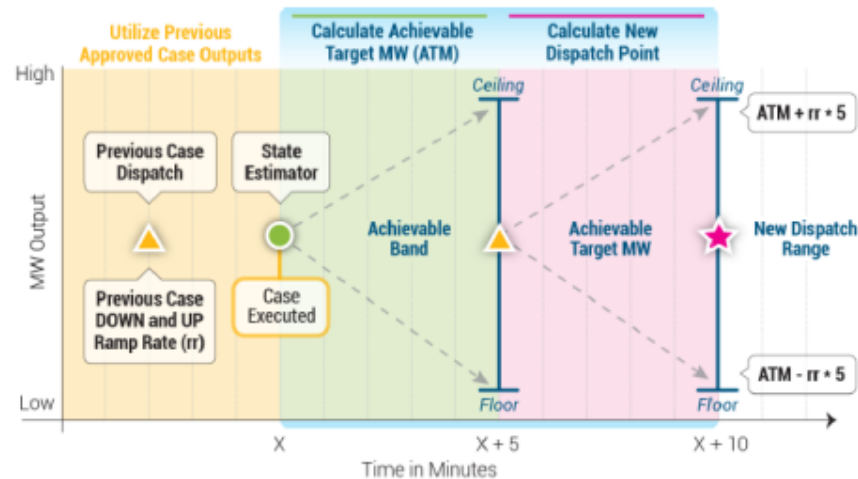
CT Examples

- **CTs typically have ramp rates that allow SCED to move them between min and max (or close to it) within SCED solutions. Example:**
  - **SCED has a 5-10 minute look ahead.**
  - **Max: 100 MW**
  - **Min: 60 MW**
  - **Ramp rate needed to move between 60 and 100 MW within one SCED solution:**
    - 40 MW / 10 minutes = 4 MW/min.

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Example – CT1

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Example – CT2

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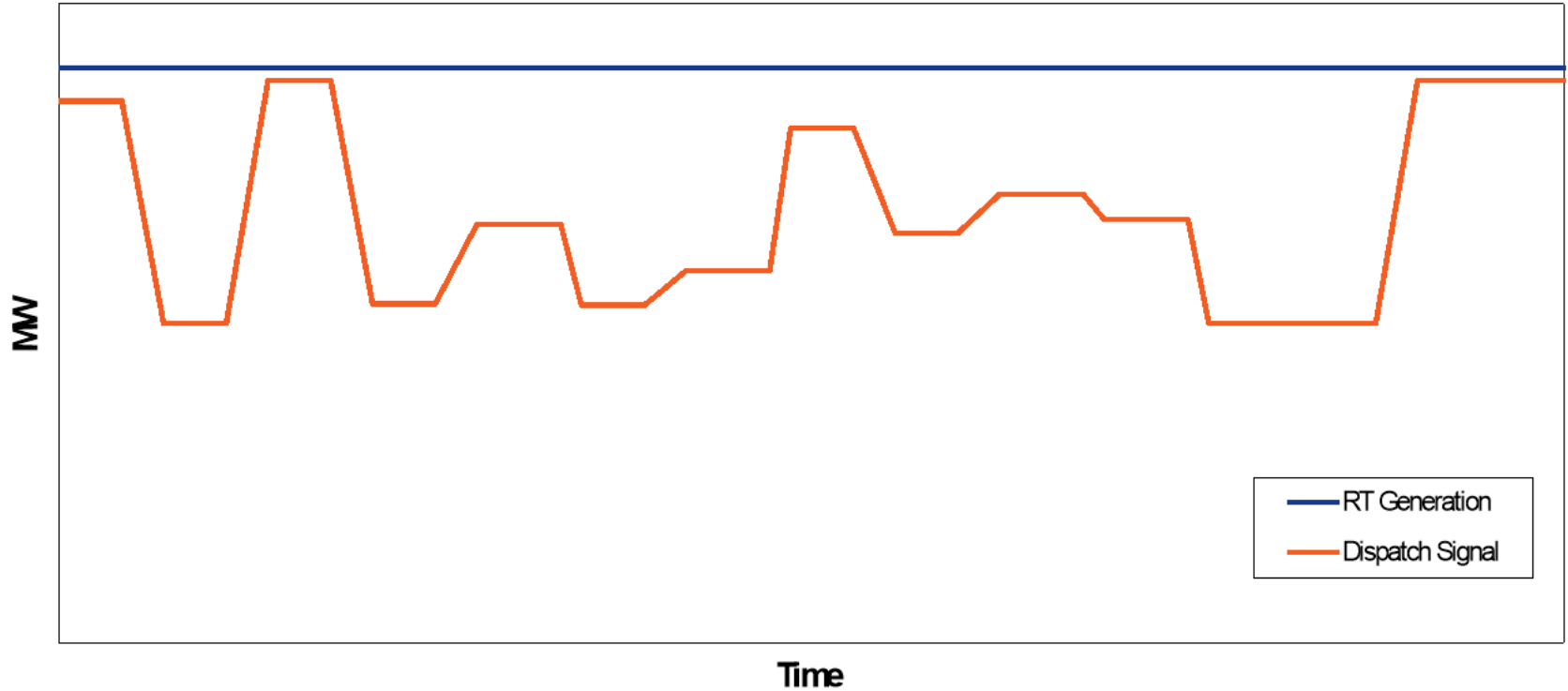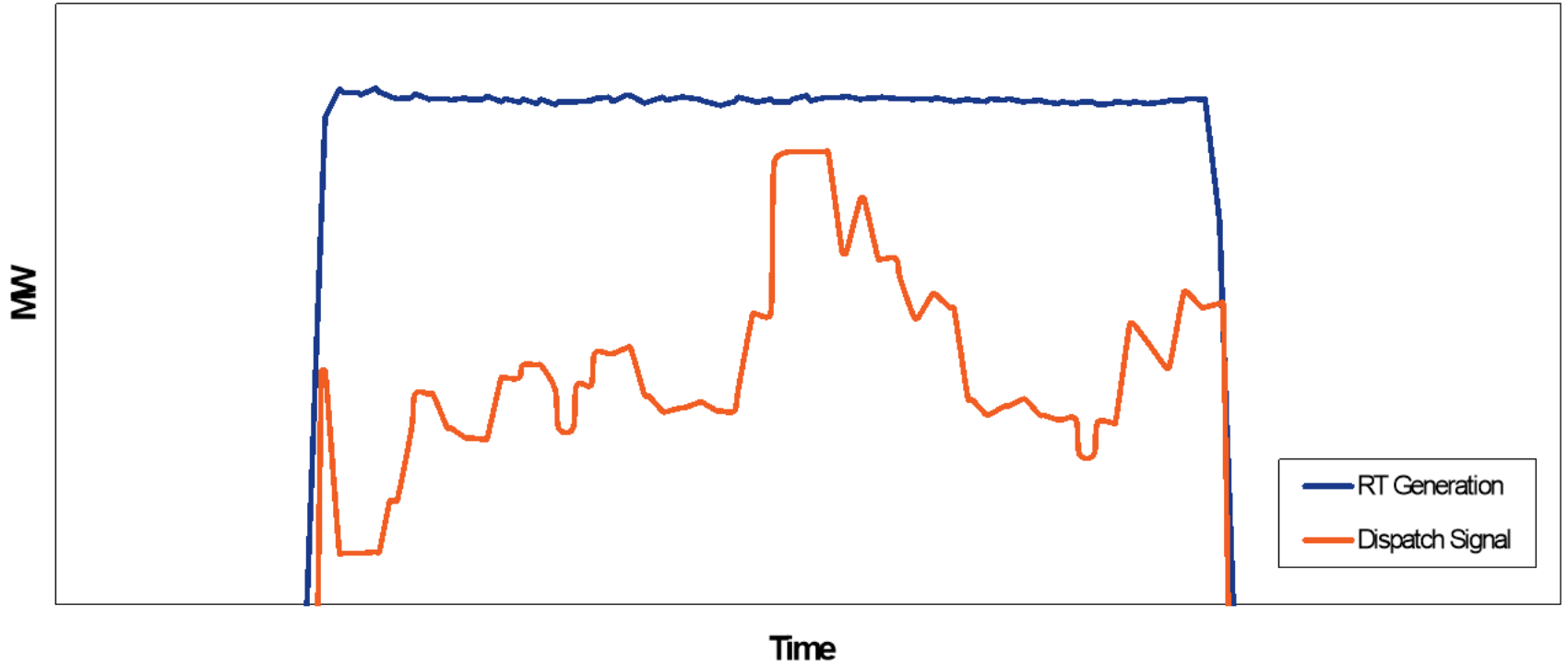
Steam Turbine Examples

- STs have slower ramp rates and are larger than CTs. SCED can only dispatch STs based on the slow ramp rates.

- This means that every SCED dispatch solution may only move STs a few MW (1 MW/minute ramp rate equates to a 10 MW reduction instruction).

- When a slow ST decides not to follow dispatch, SCED follows the ST actual MW output, instead of the other way around.

  - The dispatch signal lags the output of the unit. SCED will try to dispatch the unit down but it can only dispatch it down based on what the ramp rate allows.

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Steam Turbine Examples

- **For STs, it is necessary to calculate a metric equal to the MW the unit could have achieved if it followed the signal.**

- **This metric (achievable MW) allows a comparison between the actual output to what the unit should have done had it followed dispatch consistently.**

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Example – ST1

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Example – ST2

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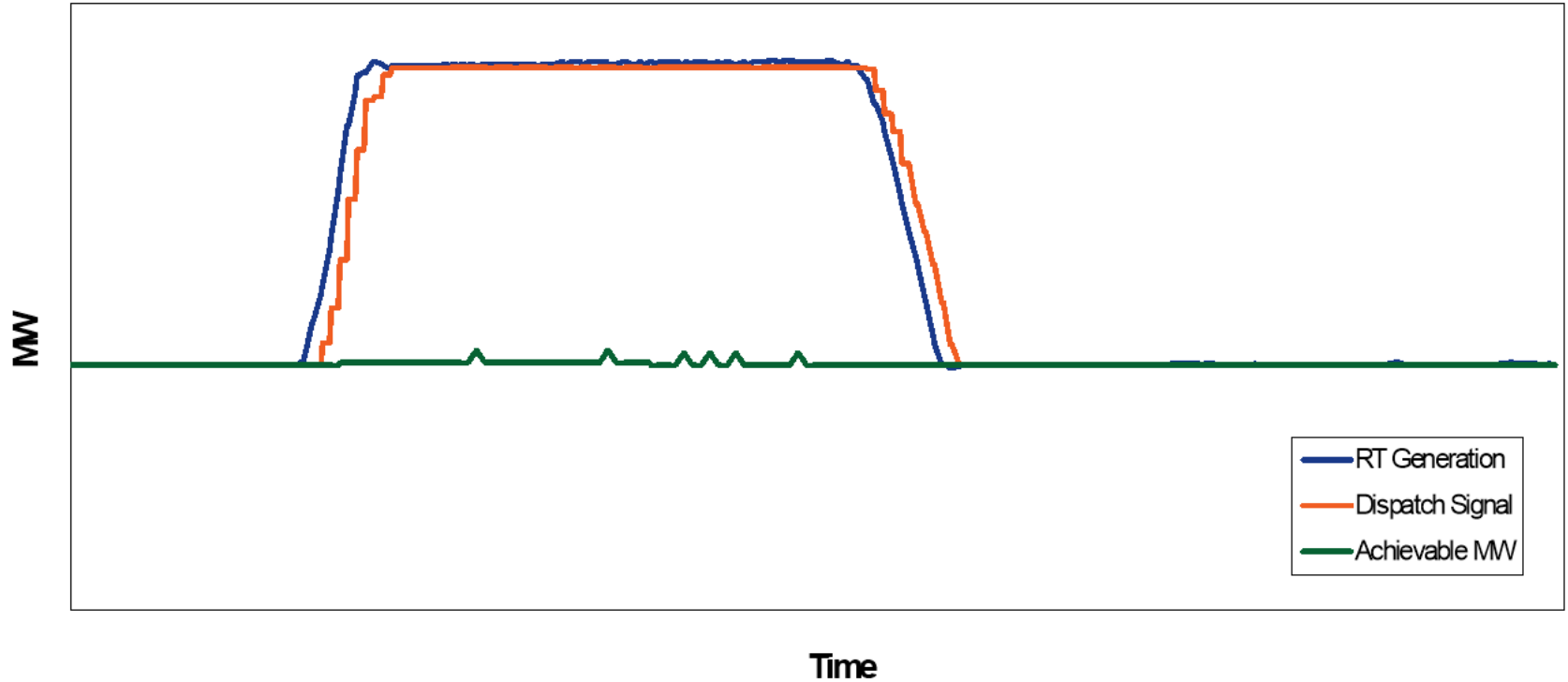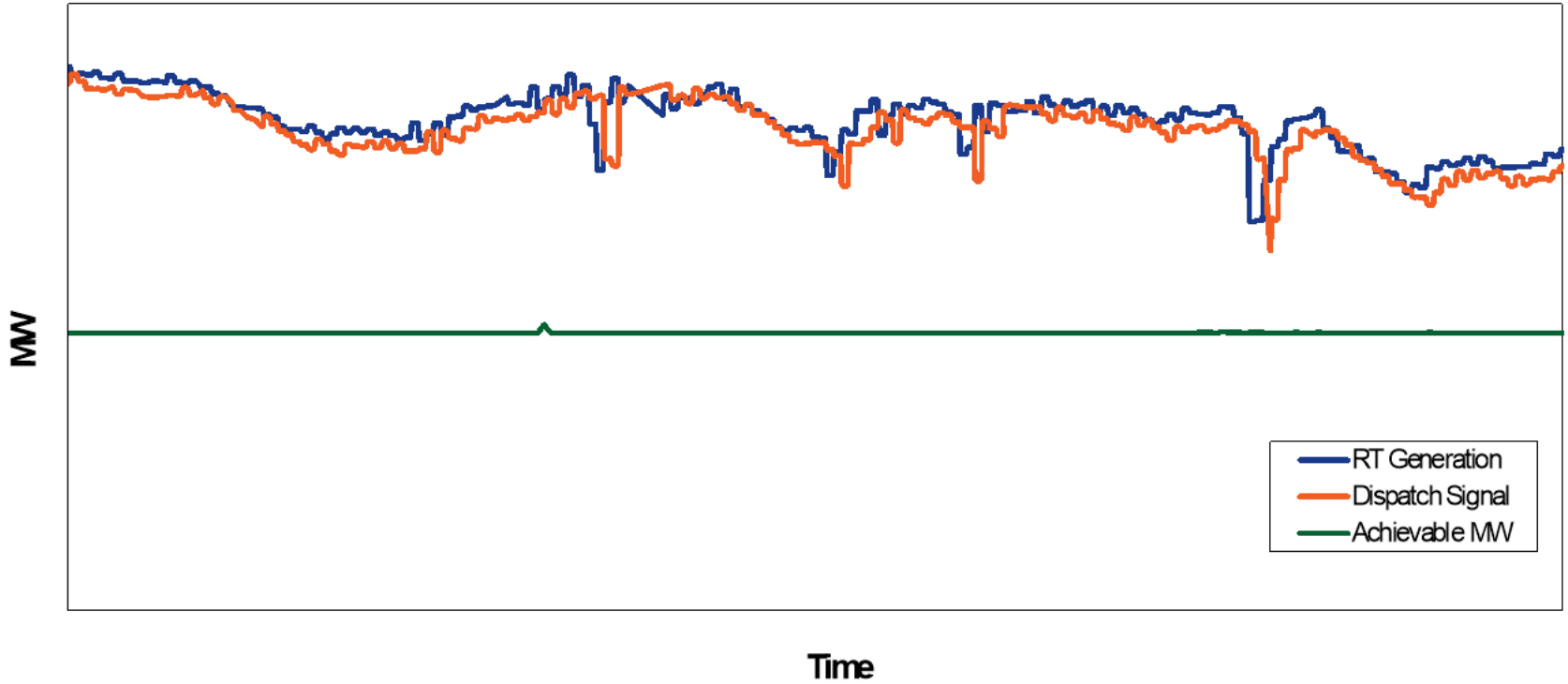
Other Cases

- **Similar issues occur (although less frequently) with other unit types.**
  - **For example, wind and solar may receive signals to be curtailed (i.e. zero MW signal): SCED; signal; dispatcher call.**
  - **If the unit does not respond, they are made whole for injecting power at negative prices, even below their negative offers.**

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