

Regulation Overview - Dispatch

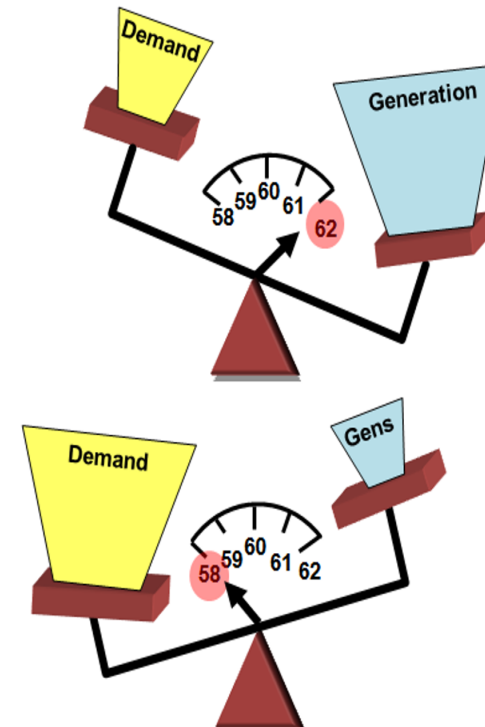
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RMDSTF
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Purpose:

- To control small mismatches (imbalance) between load and generation (ACE).
 - Corrects for both High and Low ACE deviations
- Regulation signals automatically sent to committed resources to immediately begin correcting ACE deviations.
- Manual Dispatcher intervention to the signal is available for more extreme scenarios and not common practice

Imbalance Conditions



Over-Generation

- Total Generation > Total Demand
- Frequency > 60 Hertz
- Generators momentarily speed up

Under-Generation

- Total Generation < Total Demand
- Frequency < 60 Hertz
- Generators momentarily slow down

- The PJM RTO's Regulation requirement is 525 effective MW during non-ramp hours and 800 effective MW during ramp hours. The ramp and non-ramp period will be determined seasonally, based on system conditions.
 - Ramp hours carry larger regulation requirements to address the expected larger volatility in those hours.
- PJM dispatch may increase or decrease the regulation requirements as needed to accommodate system conditions
 - Generally implemented during Peak Days / Hot and Cold Weather Alerts

Regulation Requirement Definition

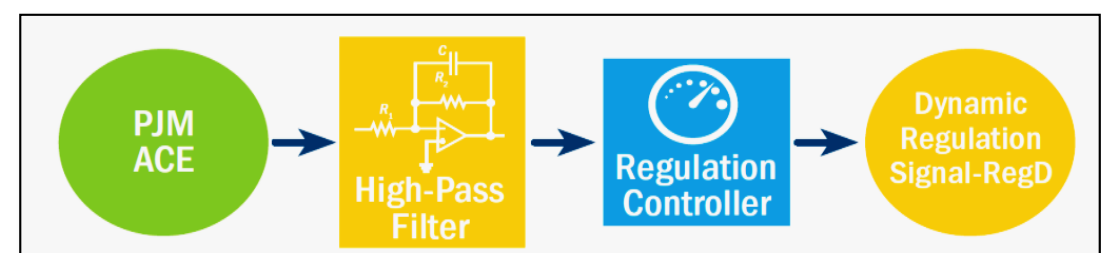
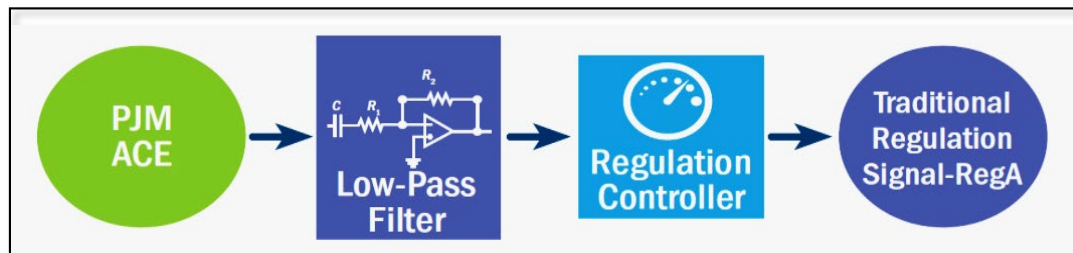
Season	Dates	Non-Ramp Hours	Ramp Hours	Effective MW Requirement
Winter	Dec 1 – Feb 29	HE1 – HE4, HE10 – HE16	HE5 – HE9, HE17 – HE24	Non-Ramp = 525MW Ramp = 800MW
Spring	Mar 1 – May 31	HE1 – HE5, HE9 – HE17	HE6 – HE8, HE18 – HE24	Non-Ramp = 525MW Ramp = 800MW
Summer	Jun 1 – Aug 31	HE1 – HE5, HE15 – HE18	HE6 – HE14, HE19 – HE24	Non-Ramp = 525MW Ramp = 800MW
Fall	Sep 1 – Nov 30	HE1 – HE5, HE9 – HE17	HE6 – HE8, HE18 – HE24	Non-Ramp = 525MW Ramp = 800MW

Traditional Regulation Signal (REGA)

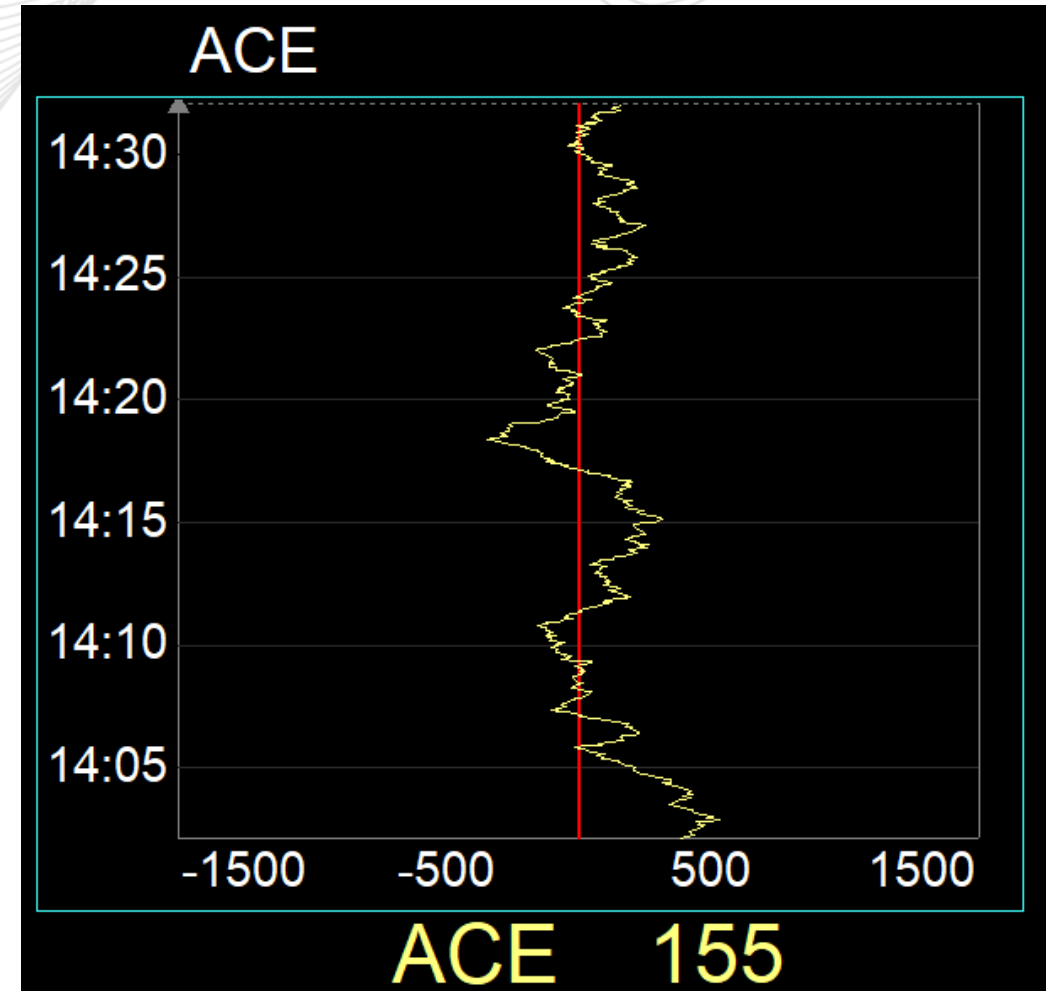
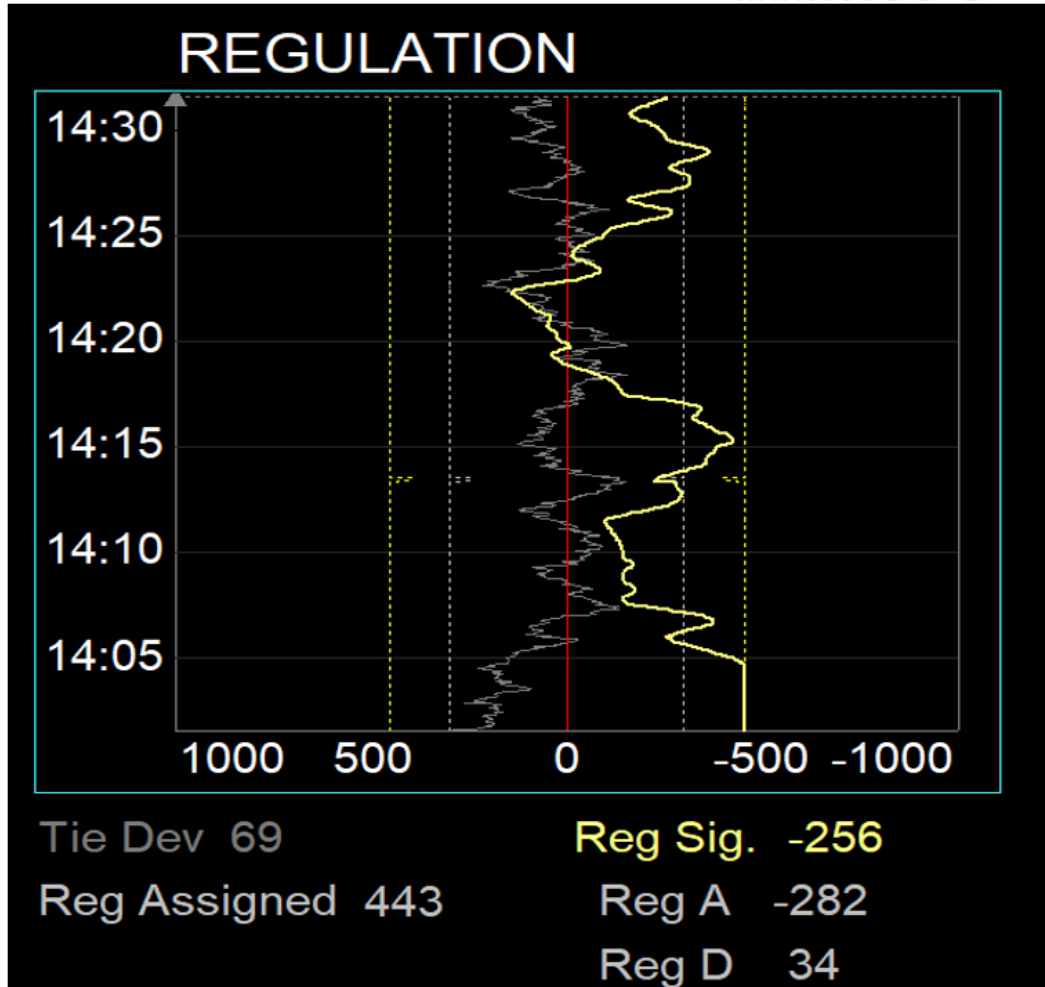
- A function of slow filter of RTO Area Control Error (ACE)
- Can remain full raise or lower for extended periods

Dynamic Regulation Signal (REGD)

- A function of fast filter of RTO ACE



PJM's RegA and RegD signals are *interdependent* and work together to help PJM dispatch with balancing and ACE control



- Is A Static Regulation Requirement Reflective of System Needs?
 - Sudden Load increase or decrease can vary from 100mw to 1000mw
 - Seasonal Requirement and changing Weather Patterns
- Does Current Structure Consider Impact of Intermittent Resources?
 - Solar characteristics, Behind the Meter, Battery Response
- Effective Regulation Can be Misleading!
 - Magnified by amount of RegD that is assigned (due to benefits factor)
 - More misleading during off ramp hours due to lower (525MW) reqt.

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