



# Updated Operating Parameter Definitions

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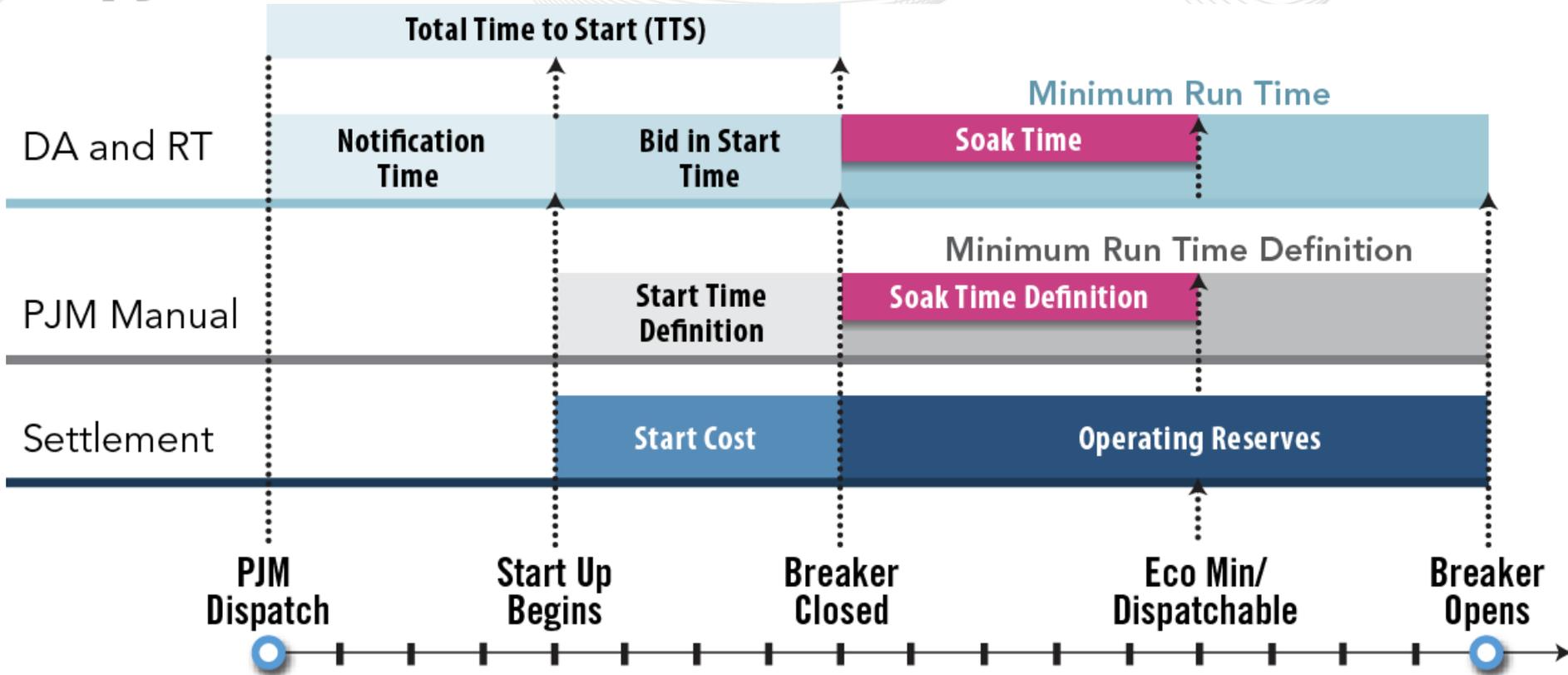
February 25, 2016

A number of operating parameters that are only defined in the Markets Gateway User's Guide have led to confusion among the members on what values should be entered into Markets Gateway. PJM has also identified a few terms in Manual 15 that could be clarified.

- Problem Statement approved at the November 2015 MIC.
- Issue Charge approved at the December 2015 MIC.
- Topic discussed at four sessions of the MIC in January and February.
- Endorsement will be requested at the March MIC, MRC, and MC for Manual 15.

Parameter	Current Location	Definition Location
Notification Time	User Guide	M-11
Start-up Time	User Guide	M-11
Minimum Run Time	User Guide	M-11
Minimum Down Time	New/User Guide	M-11
Maximum Daily Starts	User Guide	M-11
Maximum Weekly Starts	User Guide	M-11
Maximum Run Time	User Guide	M-11
Soak Time (proposed new parameter)	New	M-11
Start-up cost	M-15	M-15
No-load cost	M-15	M-15
Cancellation fees (cancellation credit)	M-11/28	M-11/28

# Proposed Operating Parameter Relationship



**Cold/Warm/Hot Notification Time (hour)** — *The time interval between PJM notification and the beginning of the start sequence for a generating unit that is currently in its cold/warm/hot temperature state. Start sequence may include steps such as any valve operation, starting feed water pumps, startup of auxiliary equipment, etc.*

**Cold/Warm/Hot Start-up Time (hour)** — *The time interval, measured in hours, from the beginning of the start sequence to the point after generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero for a generating unit in its cold/warm/hot temperature state. For a Combined Cycle unit it is the time interval from the beginning of the start sequence to the point after first combustion turbine generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero. Start sequence may include steps such as any valve operation, starting feed water pumps, startup of auxiliary equipment, etc.*

**Minimum Run Time (hour)** — *The minimum number of hours a unit must run, in real-time operations, from the time after generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero to the time of generator breaker opening, as measured by PJM's state estimator. For Combined Cycle units this is the time period after the first combustion turbine generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero and the last generator breaker opening as measured by PJM's state estimator.*

**Minimum Down Time (hour)** — *The minimum number of hours under normal operating conditions between unit shutdown and unit startup, calculated as the shortest time difference between the unit's generator breaker opening and after the unit's generator breaker closure, which is typically indicated by telemetered or aggregated state estimator MWs greater than zero. For Combined Cycles units this is the minimum number of hours between the last generator breaker opening and after first combustion turbine generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero.*

**Maximum Daily Starts** — *The maximum number of times that a unit can be started in a day under normal operating conditions.*

**Maximum Weekly Starts** — *The maximum number of times that a unit can be started in one week under normal operating conditions (168 hour period starting Monday 0001 hour).*

**Maximum Run Time (hour)** — *The maximum number of hours a unit can run over the course of an operating day as measured by PJM's state estimator.*

**Hot/Warm/Cold Soak Time (hour)** — *The minimum number of hours a unit must run, in real-time operations, from the time after generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero to the time the unit is dispatchable. For Combined Cycle units this is the minimum number of hours from the time just after the first combustion turbine generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero and the time the unit is dispatchable.*

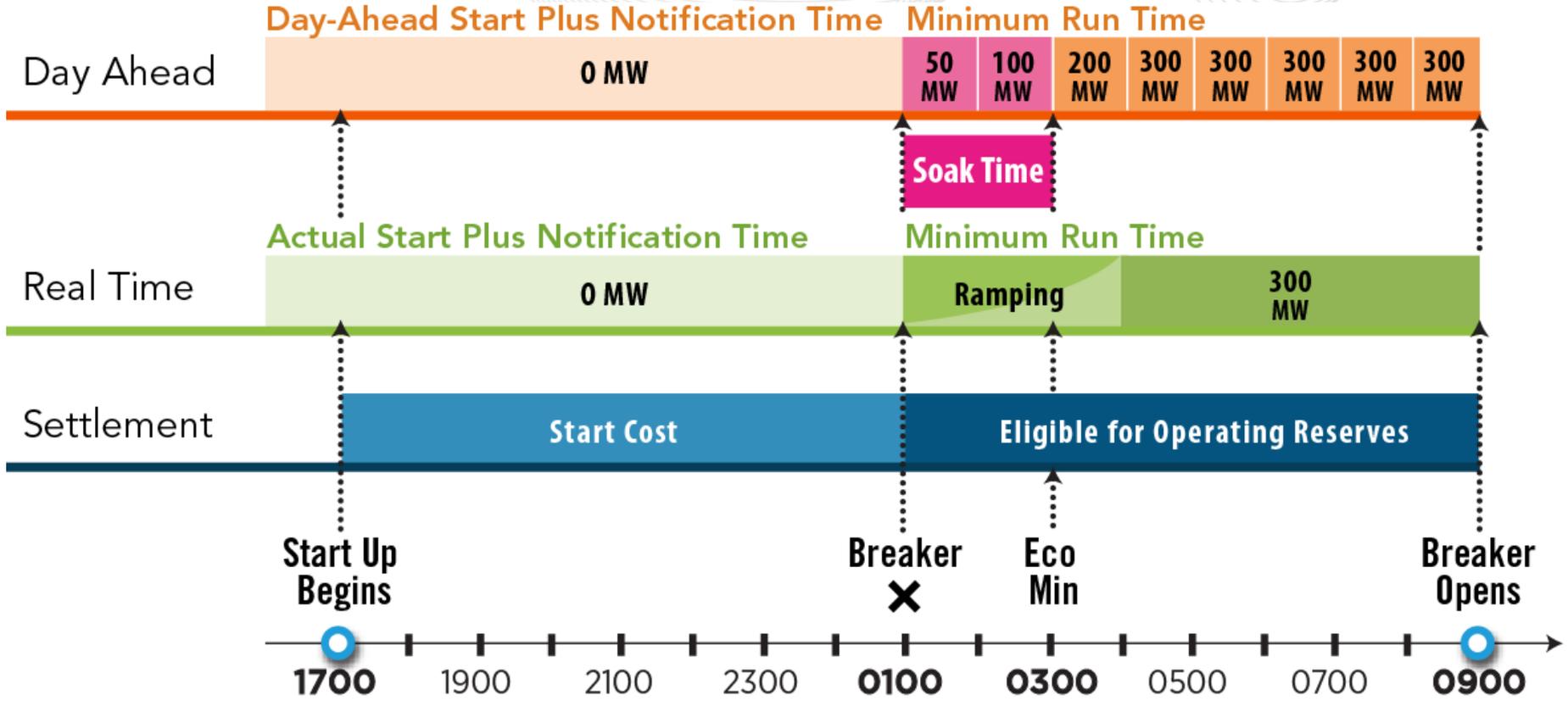
**Start-up Costs (\$)** — *The unit costs required to bring the boiler, turbine, and generator from shut-down conditions to the point after breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero and is determined based on the cost of start fuel, total fuel-related cost, performance factor, electrical costs (station service), start maintenance adder, and additional labor cost if required above normal station manning.*

**No-load Costs (\$/hour)** — *The hourly cost required to create the starting point of a monotonically increasing incremental offer curve for a generating unit.*

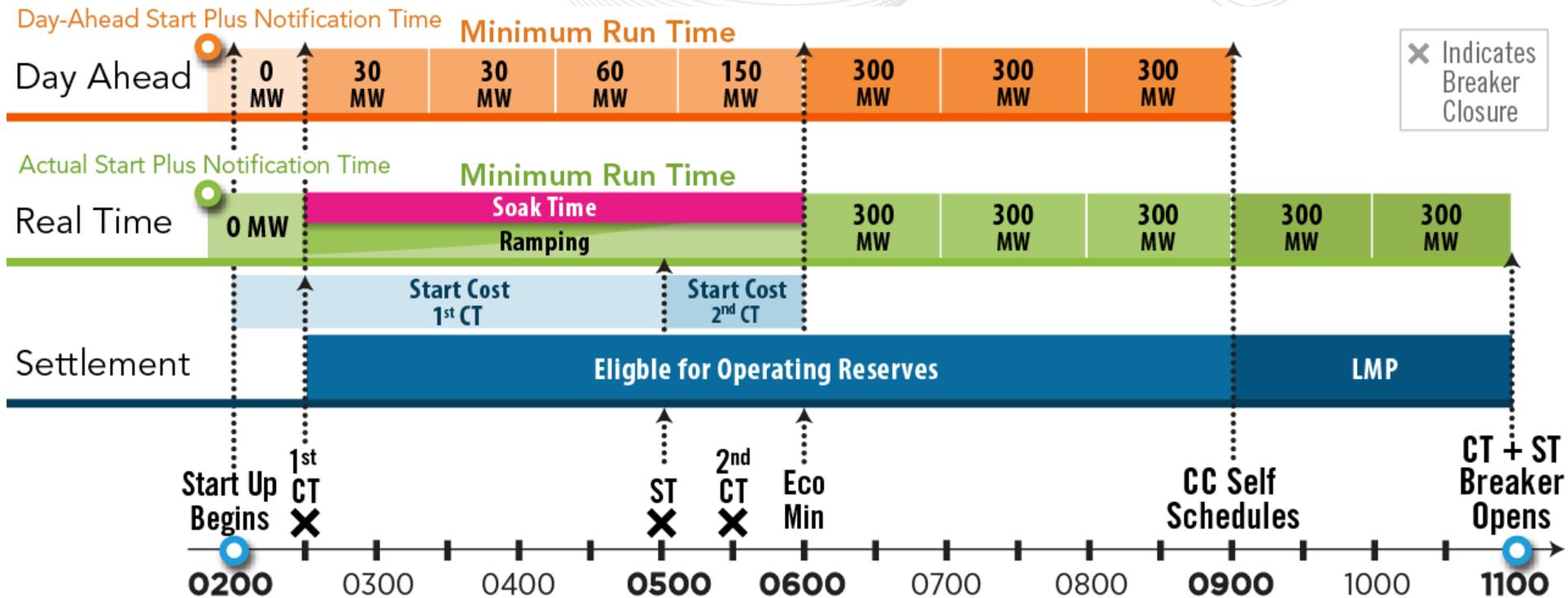
**Cancellation Fees (\$)** — *The actual costs incurred that are typically included in Start-up Costs, when PJM cancels a pool-scheduled generation resource's start and the resource has not yet reached the point after generator breaker closure which is typically indicated by telemetered or aggregated state estimator MWs greater than zero. Cancellation Fees shall be capped at the appropriate Start-up Cost for the resource as specified in its offer data.*

# Appendix

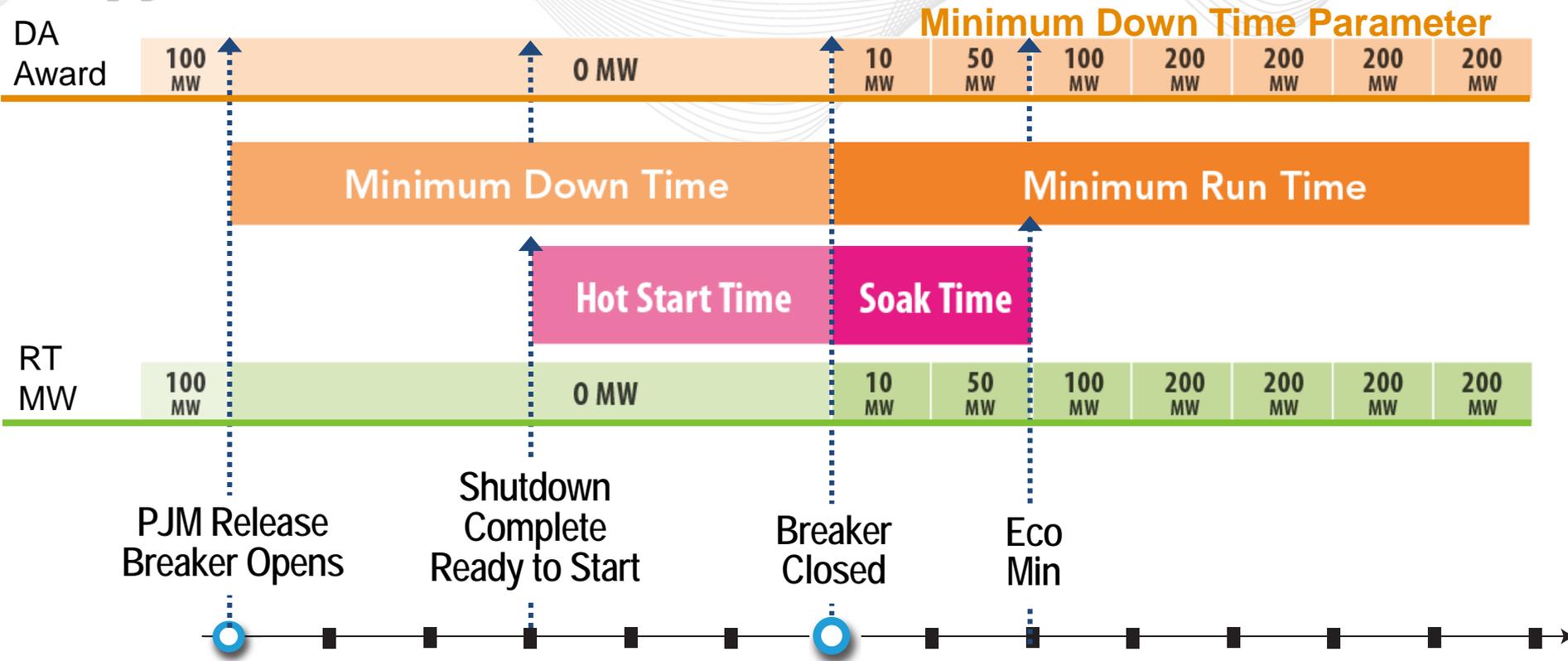
# Operating Parameter Relationship – Steam Unit



# Operating Parameter Relationship - Combined Cycle Example



# Day-Ahead Dispatch / Min Gen Event



# Real-Time Dispatch After Shutdown

