



### 3.3 Cold Weather Alert

The purpose of the Cold Weather Alert is to prepare personnel and facilities for expected extreme cold weather conditions. As a general guide, PJM can initiate a Cold Weather Alert across the RTO or on a Control Zone basis when the forecasted weather conditions approach minimum or actual temperatures of 10 degrees Fahrenheit or below . PJM can initiate a Cold Weather Alert at higher temperatures if PJM anticipates increased winds or if PJM projects a portion of gas fired capacity is unable to obtain spot market gas during load pick-up periods (refer to Inter RTO Natural Gas Coordination Procedure below). PJM will initiate the Cold Weather Alert for the appropriate region(s) in advance of the operating day based on historical experience, information supplied by the pipelines and/or information supplied from the generator owners.

#### **PJM Actions:**

- PJM dispatcher notifies PJM management, PJM public information personnel, and members.
- PJM dispatcher issues an Alert and provides the following information:
  - Control Zone
  - Forecasted low temperature
  - The forecasted duration of the condition
  - Amount of estimated operating reserve and reserve requirement
  - Reminder to Gen Owners to update their unit parameters in eMkt to reflect revised Start-up and Notification times, max run times, min run times, etc.
  - PJM Dispatch communicates whether fuel limited resources are required to be placed into Maximum Emergency Category.
- PJM Dispatch reviews the load forecast, interchange forecast, the increased MW unavailability from the tables below and generator Times to Start (Start-Up + Notification in eMkt) to confirm if the Day Ahead Market will be able to clear sufficient generation that can be on-line to meet the reliability needs of the system for the following operating day. If sufficient generation cannot be cleared in the Day Ahead market based the start-up + notification time, the following processes will be used to commit generation in advance of the Day Ahead Market:
  - Natural gas generating units:
    - PJM Dispatch will notify the generator owner that the unit is required to be online and ready to follow PJM dispatch signals at XX:XXhrs on XX day for reliability. The unit parameters and the offer will then be confirmed and the unit will be offer capped with the schedule being 'locked in' as indicated in M-11. PJM Dispatch will inform the gen owner to run for the greater of:
      - The unit's Min Run time OR

**NOTE:** Any discussions on unit commitment outside of the Day Ahead Market must be predicated on the unit parameters listed in eMkt which include: notification/start-up time, min run time, max run time, cost and price schedule.

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- The duration that PJM requires the unit to run for reliability reasons.
  - Generators committed under this procedure will be run for the hours scheduled and will be included in the DA Market as indicated in Manual M-11.
  - The PJM OATT does not allow for stranded fuel recovery for any reason to include forced outage, failure to meet start profiles, or decommitted due to reliability issues.
- Non-natural gas generating units:
  - PJM Dispatch will notify the generator owner that the unit is required to be online and ready to follow PJM dispatch signals at XX:XXhrs on XXday for reliability. The unit parameters and the offer will then be confirmed and the unit will be offer capped. PJM dispatch will NOT commit to run the unit longer than its Min Run time.
  - Generators committed under this procedure will be run for the hours scheduled and will be included in the DA Market as indicated in M-11
    - **NOTE:** The unit may also be cancelled at any time prior to coming on-line if system conditions change. Costs will be recoverable as indicated in M-11.

**Note 1:** Since a Cold Weather Alert may only be issued on a portion of the PJM footprint, and since PJM schedules and operates the footprint as a single Balancing Authority, PJM may elect not to automatically place Fuel Limited Resources into the Maximum Emergency Category.

**Note 2:** There may be times when Gas-fired Fuel Limited Combustion Turbines are placed into the Maximum Emergency Generation Category with a daily availability < 8 hours per day (i.e. 5 hours of gas per day). Considering the daily nature of gas limitations, the PJM Dispatcher has the option of requesting the generator owner, with daily gas limitations, to remove the fuel limited resource from the Maximum Emergency Category to ensure PJM tools economically schedule the gas fired CTs.

PJM utilizes the following weather locations and approximate unavailability rates to declare Cold Weather Alerts on a PJM Control Area or Control Zone basis.

Control Zone	Region	Weather	Unavailability
Mid Atlantic	Mid-Atlantic	Philadelphia	4000 - 5000 MW
FE-South	Western	Pittsburgh	500 – 1000 MW
AEP	Western	Columbus	1000 – 1500 MW
Dayton	Western	Dayton	500 – 1000 MW
ComEd	Western	Chicago	2000 – 3000 MW



Dominion	Southern	Richmond	1000 – 2000 MW
FE-West	Western	Cleveland	500 – 1000 MW
DEOK	Western	Cincinnati	200 – 300 MW
EKPC	Western	Winchester	200 – 300 MW

**Note:** Unavailability numbers are conservative estimates and are not necessarily additive. During the start of extreme cold weather unavailability rates are typically higher. Values can be adjusted based on the duration of cold weather, actual unit performance during cold weather, the impact on fuel sources (i.e., frozen coal, gas interruptions, etc.), the projected level of combined cycle/combustion turbine usage, and level of scheduled long-lead/seldom-run generation.

- When scheduling for a period covered by a Cold Weather Alert, PJM dispatch may assume an unavailability factor for scheduled interchange that could range from 25% to 75% of the pre-scheduled interchange. PJM Dispatch will make this decision based on the severity of the conditions, recent interchange curtailment experience, and the current/projected impact of the weather system on other Control Areas. This decrease may require the commitment of additional steam units and/or the purchase of emergency power from external systems.
- When in PJM's judgment combustion turbines in excess of 2000 MW are needed to operate within a control zone, PJM will notify the respective combustion turbine owners that PJM expects these units to be run. If the predicted minimum temperature is -5 degrees Fahrenheit or less or if recent unit performance has shown a significant increase in unit unavailability, an additional level of unavailability is added to the amount of CTs expected to operate. PJM will notify these additional combustion turbine owners that PJM expects these units to be run.
- PJM confers with generator owners and if appropriate, directs them to call in or schedule personnel in sufficient time to ensure that all combustion turbines and diesel generators that are expected to operate are started and available for loading when needed for the morning pick up. This includes operations, maintenance, and technical personnel that are necessary to gradually start all equipment during the midnight period. Directions may also be given to bring units on at engine idle, or loaded as necessary to maintain reliability. Once units are started, they remain on-line until PJM dispatcher requests the units be shut down. Running CTs to provide for Synchronized Reserve is monitored closely for units where fuel and delivery may be hampered. Most troublesome or unreliable units should be started first. PJM dispatch should make this notification on afternoon shift the day prior, paying particular attention to weekend staffing levels.
- PJM dispatch should poll large combined cycle units regarding projected availability during reserve adequacy run.

~~**Note:** PJM Dispatch will make efforts to contact owners of gas-fired generation to obtain information regarding the supply and procurement of gas from their respective pipeline suppliers in advance of the operating day for when the cold weather alert is issued.~~

- PJM dispatch reports significant changes in the estimated operating reserve capacity.



- PJM dispatch cancels the alert if the weather forecast is changed or when the alert period is over.

**PJM Member Actions:**

- Transmission/Generation dispatchers notify management of the alert.
- Generation dispatchers update their unit parameters, including the Start-up and Notification, Min Run Time, Max Run Time, Eco Min, Eco Max, etc. in eMkt.
- Generation dispatchers with dual fuel units confirm the equipment is functional and amount of alternate fuel available. Outages to the alternate fuel capability will be submitted to PJM via eDart. Fuel restrictions will be communicated via eMkt.
- Generation dispatchers, based on direction received from PJM call in or schedule personnel in sufficient time to ensure that all combustion turbines and diesel generators that are expected to operate are started and available for loading when needed for the morning pick up. This includes operations, maintenance, and technical personnel that are necessary to gradually start all equipment during the midnight period. The units are brought on at engine idle, where possible, and loaded as necessary to maintain reliability. Once units are started, they remain on-line until PJM dispatcher requests the units be shut down. Running CTs to provide for Synchronized Reserve is monitored closely for units where fuel and delivery may be hampered. Each generator owner attempts to start their most troublesome or unreliable units first.

**Note:** When a unit that PJM alerted to be prepared to run is not started, the owner of this unit can receive compensation for its costs. The Generation Owner must submit a letter to the PJM Manager of Market Settlements within 45 days identifying the actual costs of staffing the unit. After such notification, PJM will compensate the unit from Operating Reserves for these cancellation costs up to the capped start-up costs (as per the Operating Agreement, Section 1.10.2d Pool Scheduled Resources and .2.3g Operating Reserves Credits; for detailed process see Operating Agreement Accounting Manual, Operating Reserves Credits).

- Generation dispatchers review their combustion turbine capacities, specifically units burning No. 2 fuel oil that do not have sufficient additive to protect them from the predicted low temperature.
- Generation dispatchers review fuel supply/delivery schedules in anticipation of greater than normal operation of units.
- Generation dispatchers monitor and report projected fuel limitations to PJM dispatcher and update the unit Max Run field in eMkt.
- Generation dispatcher contact PJM dispatch if it is anticipated that spot market gas is unavailable, resulting in unavailability of bid-in generation.
- Generation dispatchers contact PJM dispatch to inform them of gas-fired CTs placed in Maximum Emergency Generation due to daily gas limitations of less than 8 hours (i.e. 5 hours of gas per day).



- Transmission/Generation dispatchers review plans to determine if any maintenance or testing, scheduled or being performed, on any monitoring, control, transmission, or generating equipment can be deferred or cancelled.

### 3.4 Hot Weather Alert

The purpose of the Hot Weather Alert is to prepare personnel and facilities for extreme hot and/or humid weather conditions which may cause capacity requirements/unit unavailability to be substantially higher than forecast are expected to persist for an extended period. In general, a Hot Weather alert can be issued on a Control Zone basis, if projected temperatures are to exceed 90 degrees with high humidity for multiple days. A Hot Weather Alert will be issued for the Dominion and EKPC Control Zones when projected temperatures are to exceed 93 degrees with high humidity for multiple days.

PJM utilizes the following weather locations and approximate unavailability rates to declare Hot Weather Alerts on a PJM Control Area or Control Zone basis.

Control Zone	Region	Weather	Unavailability
Mid-Atlantic	Mid-Atlantic	Philadelphia	2000 - 2500 MW
FE South	Western	Pittsburgh	300 – 500 MW
AEP	Western	Columbus	500 – 1000 MW
Dayton	Western	Dayton	300 – 500 MW
ComEd	Western	Chicago	1000 – 1500 MW
Dominion	Southern	Richmond	500 - 1000 MW
FE West	Western	Cleveland	300 – 500 MW
DEOK	Western	Cincinnati	100 – 200 MW
EKPC	Western	Winchester	100 – 200 MW

**Note:** Unavailability numbers are conservative estimates and are not necessarily additive. As extreme hot weather continues unavailability rates may begin to increase. Values can be adjusted based on the duration of hot weather, actual unit performance during hot weather, projected environmental impacts (i.e. river water temperatures, hydro elevation) and level of scheduled long lead/seldom run generation.

#### PJM Actions:

- PJM dispatch notifies PJM management and member dispatchers.
- PJM dispatch issues an Alert stating the amount of estimated operating reserve capacity and the reserve requirement.
- Reminder to Gen Owners to update their unit parameters in eMkt to reflect revised Start-up and Notification times, max run times, min run times, etc.
- PJM Dispatch communicates whether fuel limited resources are required to be placed into Maximum Emergency Category for Hot Weather/Cold Weather Alerts.
- PJM Dispatch reviews the load forecast, interchange forecast, the increased MW unavailability from the tables below and generator Times to Start (Start-Up + Notification in eMkt) to confirm if the Day Ahead Market will be able to clear sufficient generation that can be on-line to meet the reliability needs of the system for the following operating day. If sufficient generation cannot be cleared in the Day

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Ahead market based the start-up + notification time, the following processes will be used to commit generation in advance of the Day Ahead Market:

**NOTE:** Any discussions on unit commitment outside of the Day Ahead Market must be predicated on the unit parameters listed in eMkt which include: notification/start-up time, min run time, max run time, cost and price schedule.

o Natural gas generating units:

▪ PJM Dispatch will notify the generator owner that the unit is required to be online and ready to follow PJM dispatch signals at XX:XXhrs on XX day for reliability. The unit parameters and the offer will then be confirmed and the unit will be offer capped with the schedule being 'locked in' as indicated in M-11. PJM Dispatch will inform the gen owner to run for the greater of:

- The unit's Min Run time **OR**
- The duration that PJM requires the unit to run for reliability reasons.

▪ Generators committed under this procedure will be run for the hours scheduled and will be included in the DA Market as indicated in Manual M-11.

▪ The PJM OATT does not allow for stranded fuel recovery for any reason to include forced outage, failure to meet start profiles, or decommitted due to reliability issues.

o Non-natural gas generating units:

▪ PJM Dispatch will notify the generator owner that the unit is required to be online and ready to follow PJM dispatch signals at XX:XXhrs on XXday for reliability. The unit parameters and the offer will then be confirmed and the unit will be offer capped. PJM dispatch will NOT commit to run the unit longer than its Min Run time.

▪ Generators committed under this procedure will be run for the hours scheduled and will be included in the DA Market as indicated in M-11

- **NOTE:** The unit may also be cancelled at any time prior to coming on-line if system conditions change. Costs will be recoverable as indicated in M-11.

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**Note 1:** Since a Hot Weather Alert may only be issued on a portion of the PJM footprint, and since PJM schedules and operates the footprint as a single Balancing Authority, PJM may elect not to automatically place Fuel Limited Resources into the Maximum Emergency Category.

**Note 2:** There may be times when Gas-fired Fuel Limited Combustion Turbines are placed into the Maximum Emergency Generation Category with a daily availability < 8 hours per day (i.e. 5 hours of gas per day). Considering the daily nature of gas



limitations, the PJM Dispatcher has the option of requesting the generator owner, with daily gas limitations, to remove the fuel limited resource from the Maximum Emergency Category to ensure PJM tools economically schedule the gas fired CTs.

- PJM dispatch reports significant changes in the estimated operating reserve capacity.
- PJM dispatch cancels the alert, when appropriate.

**PJM Member Actions:**

- Transmission/Generation dispatchers notify management of the alert.
- Generation dispatchers update their unit parameters, including the Start-up and Notification, Min Run Time, Max Run Time, Eco Min, Eco Max, etc. in eMkt.
- Generation dispatchers with dual fuel units confirm the equipment is functional and amount of alternate fuel available. Outages to the alternate fuel capability will be submitted to PJM via eDart. Fuel restrictions will be communicated via eMkt.
- Generation dispatchers advise all generating stations and key personnel.
- Transmission/Generation dispatchers review plans to determine if any maintenance or testing, scheduled or being performed, on any monitoring, control, transmission, or generating equipment can be deferred or cancelled.
- Generation dispatchers report to PJM dispatcher all fuel / environmental limited facilities as they occur and update PJM dispatcher as appropriate and update the unit Max Run field in eMkt.
- Generation dispatchers contact PJM dispatch to inform them of gas-fired CTs placed in Maximum Emergency Generation due to daily gas limitations of less than 8 hours (i.e. 5 hours of gas per day).



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