

- PJM dispatcher informs affected Members of any storms moving in their direction.

***PJM Member Actions:***

- Transmission dispatchers inform PJM dispatcher of any storms in their systems.
- Transmission dispatchers determine when reclosers are to be restored to service and report this information to PJM dispatcher.
- Transmission dispatchers place reclosers in service.

### 3.7 Geo-Magnetic Disturbances

Geomagnetically-induced currents (GIC) caused by the geo-magnetic disturbance (GMD) flow through the power system equipment and facilities may result in major increases in system reactive requirements, equipment damage, and disruption of interconnected system operation. PJM will provide notification via the All-Call system and Emergency Procedure Posting Application when the National Oceanic and Atmospheric Administration (NOAA) has issued an alert for a potential geo-magnetic disturbance of severity K5 or greater. To implement the procedure, a geomagnetic storm is detected that produces DC measurements at Missouri Avenue in Atlantic City and/or Meadow Brook Station near Winchester, Virginia with magnitudes greater than 10 amperes for a maximum of 10 minutes and the PJM dispatcher confirms that this measurement is a result of a severe geomagnetic storm by checking additional sources of information. When conditions warrant, the PJM dispatcher may take action as soon as necessary for a GMD disturbance but must take action if conditions persist for 10 minutes. Additional data sources include:

- PJM dispatcher contacts PS Generation (Energy Resource & Trading) Dispatcher to determine if excess transformer MVAR exist at Salem or Hope Creek.
- PJM dispatcher contacts FE-Allegheny Transmission Dispatcher to determine if excess transformer neutral current exists at Meadow Brook, Bedington, Doubs, and or Black Oak.
- PJM dispatcher also checks with PECO Energy Transmission Dispatcher to see if similar high DC measurements are being observed at Limerick and Peach Bottom. Implementation occurs only when the Missouri Avenue activity has been confirmed by at least one additional data source. A confirmation of a geomagnetic storm by the National Oceanic and Atmospheric Administration (NOAA), which is generally received via notification from the RCIS, is not required to initiate this procedure.
- PJM dispatcher will also check with BGE Transmission Dispatcher to see if similar high DC measurements are being observed at Waugh Chapel and Conastone if available.

Upon identification of a geomagnetic disturbance, PJM dispatcher operates the system to geomagnetic disturbance transfer limits. The geomagnetic disturbance transfer limits are determined from studies modeling various scenarios, including:

- partial or complete loss of Hydro Quebec Phase 2 DC line to Sandy Pond
- reduction or complete loss of generation at Artificial Island
- tripping of certain EHV capacitors

These studies are performed by PJM's operations planning department group on a seasonal basis and are updated for current conditions, as required, when PJM dispatcher implements this procedure.

***PJM Actions:***

- PJM dispatcher notifies members (Generation and Transmission) via the PJM All-Call of GMD warnings/alerts issued by the National Oceanic and Atmospheric Administration (NOAA) via the RCIS.
- PJM dispatcher notifies members via the PJM All-Call and postings on selected PJM web-sites upon initiation of Conservative Operations due to GMD upon confirmation of activity on the PJM system. PJM dispatcher begins to operate the system to the geomagnetic disturbance transfer limits.
- When the GIC limit is approached or exceeded, generation re-dispatch assignments are made in the most effective areas to control this limit. PJM dispatcher also evaluates the impact of the existing inter-area transfers and modifies the schedules that adversely affect the GIC transfer limit. If insufficient generation is available to control this limit, the emergency procedures contained in Section 2 of this Manual are implemented. If it appears that these emergency procedures are required, an operations engineer is requested to validate the GIC transfer limit and develop a voltage drop curve for the GIC transfer limit contingency. Pre-contingency load dumping will not be used to control transfers to the GIC transfer limit.
- After the measurement value at Missouri Avenue has fallen below the initial trigger point of 10 amperes, PJM dispatcher continues to operate the system to the geomagnetic disturbance transfer limits for a period of three hours. PJM dispatcher must again confirm this measurement by checking the other sources of information. If the measurement value remains below 10 amperes for three hours, members are notified that the procedure is cancelled. PJM dispatcher restores the appropriate transfer limits for operation of the system.

***PJM Member Actions:***

- Transmission/Generation dispatchers provide confirmation of measurement values as requested by PJM dispatcher.
- Generation dispatchers provide as much advance notification as possible regarding details of more restrictive plant procedures that may result in plant reductions to protect equipment.
- Upon notification of the implementation of this procedure, members that operate facilities with instrumentation installed to record DC neutral measurements at remote locations dispatch personnel to ensure that measurement equipment working properly. Members employing a MVAR summing algorithm method also initiate data collection at this time. It is requested that any data collected during a geomagnetic storm be forwarded to PJM for further analysis.
- The member dispatchers report all actions to PJM dispatcher.