

Attachment F: Overview and Requirements for Remote Operations of Market Operations Centers due to Exceptional Circumstances~~during the COVID-19 Pandemic~~

~~This attachment will be effective on April 24, 2020 and will automatically expire on December 31, 2021 unless removed by PJM prior to that date.~~

PJM recognizes that, as a consequence of ~~uncontrollable~~ Exceptional Circumstances (i.e. an event or effect that can be neither anticipated nor controlled, including but not limited to any act of a public enemy, war, insurrection, riot, fire, severe weather, natural disaster, flood, civil unrest, explosion, pandemic or other public health emergency, type events, etc as reasonably determined by PJM.)~~the COVID-19 pandemic~~, Market Participants who maintain Market Operations Centers (MOCs) may find it necessary to move some or all of their control center operations to one or more non-traditional remote locations, such as a new temporary facility or the residences of control center personnel, in an effort to protect the safety and well-being of staff~~in order to avoid the risk of spreading infection~~ while maintaining control room functions. For purposes of this document, it is assumed that a member company's Energy Management System (EMS) is still functional and that only the MOC dispatch function is relocating to alternate (non-traditional) location. PJM has identified potential risks in moving to such remote control center operations which must be mitigated through compliance with the requirements set forth in this attachment such as:

- Reduced reliability of voice and data communications with PJM and other operating entities
- Reduced physical and cyber security controls
- Reduced operator situational awareness or visibility of relevant data associated with possible equipment limitations at the remote site
- Reduced effectiveness of communications

The North American Electric Reliability Corporation (NERC) has ~~recently~~ provided guidance with regards to remote control center operations. PJM recognizes that a Market Participant's transition to remote MOC operations may be necessary as an absolute "last resort" when operations cannot be continued in a traditional primary or backup control room facility due to an imminent risk of ~~COVID-19 infection~~ personnel safety and the associated control centers being uninhabitable ~~due to risk of such infection because of an Exceptional Circumstance,~~ and after notifying PJM request this type of remote operations only be implemented after that all other options ~~have been~~ are exhausted. PJM Market Participant's MOCs that are operating from a remote control center in accordance with this Attachment shall resume traditional MOC control center operations in compliance with the PJM Manuals other than

this Attachment as soon as possible. Timely updates and notification to PJM as to the status of MOCs is critical to and required under this Manual provision.

The use of MOCs is an integral component of ensuring the reliable operation of generation and transmission facilities in the PJM System. Having operators work remotely is inconsistent with PJM Manual requirements.

Any Market Participant that transitions its MOC to remote control center operations will comply with each of the requirements set forth in this Attachment. Market Participants' MOCs will be expected to meet or exceed these requirements throughout the period of the operation of a remote MOC.

Compliance with the requirements in this Attachment does not absolve the Market Participant from its obligations to comply with all applicable laws, regulations, or NERC Reliability Standards, including the PJM Governing Agreements other than the MOC control center requirement in the PJM Manuals. ^A Market Participant shall make every effort to comply with these laws, regulations, standards, and agreements to the greatest extent possible. Whether ~~the present COVID-19 pandemic~~ **Exceptional Circumstance** conditions ~~may~~ justify the exercise of enforcement discretion in evaluating compliance is a matter to be considered by those government authorities with enforcement jurisdiction, and it is the obligation of the Market Participant to seek any necessary approvals or waivers needed as a result of transitioning to remote MOC control room operations in accordance with this Attachment.

Key Reliability Requirements for Remote Operations

Equipment and Communication Requirements

1. Each Market Participant prior to the transition of remote operations, shall notify ~~the PJM~~ **NERC Reliability** Compliance ~~department~~ (contact information below) of their intention to implement remote operations. The Market Participant shall review all requirements in this manual attachment and provide written documentation to PJM of how it will meet each requirement including the cyber and physical security requirements. Furthermore, the Market Participant will notify PJM of any concerns or limitations that are not specified in the requirements but could have an impact to normal operations.
 - PJM ~~Reliability~~ **NERC** Compliance – Email: Regional_Compliance@pjm.com
 - **Primary Contact** – Chris Moran
 - Email: Christopher.Moran@pjm.com
 - Office Phone: 610-666-8962
 - Cell Phone: 610-513-1332
 - **Alternate Contact** – ~~Tom Moleski~~ **Gizella Mali**
 - Email: ~~Thomas.Moleski@pjm.com~~ Gizella.Mali@pjm.com
 - Cell Phone: ~~610-636-4457~~ [445-234-7388](tel:445-234-7388)

2. Each Market Participant shall notify PJM Dispatch before and after transitioning to remote control center operations so that communications capabilities can be tested.
3. If operations are transitioned from one remote location to another, (if communications are not being forwarded from the control center) PJM Dispatch shall be notified of the change and communications should be tested and verified with PJM Dispatch.
4. Market Participants shall ensure that each of its operator(s) for communications with PJM designated to be available 24 hours per day/7 days per week for communications with PJM has the following equipment at the location for remote control center operations available 24 hours per day/7 days a week:
 - a. High-speed internet service with sufficient bandwidth and data allowances to accommodate all real-time data feeds necessary to perform the operator's functions, including receipt of XML data if applicable;
 - b. Sufficient internet or cellular telephone communications capable of receiving calls forwarded from the dedicated PJM ring downs. This should be achieved with diversely routed backup telephone communications capability using a different mode (e.g. cellular instead of internet, or vice versa).
5. Market Participants shall establish contingency plans for failures to power, internet service, cellular telephone communications or equipment being used by the operator at the MOC's remote location (e.g. battery backup, cellular mobile hotspot, transfer operations to another remote operator, etc.).
- ~~6.~~ Each Market Participant shall ensure that there are a sufficient number of operators on shift at any time ~~to can maintain~~ reliable operations continuous ~~24 hours per day/7 days per week voice and data communications with PJM.~~
- ~~6-7.~~ 24 hours per day/7 days per week voice and data communications must be maintained between PJM operations and the MOC operators operating from a remote control center location.
- ~~7-8.~~ Each Market Participant shall ensure that voice communications from PJM are answered by the operator, and do not go to voice mail or are answered by or forwarded to some other person other than the intended operator.
- ~~8-9.~~ Each Market Participant shall ensure that, prior to commencing remote control center operations, it has communicated all appropriate contact information to each resource (generator, demand response, etc.) represented by the Market Participant.
- ~~9-10.~~ The Market Participant, in addition to responding to hotline calls, shall maintain continuous communication with all operators in the virtual control room (real time ops, transmission ops, commercial ops, etc. and with all power plants for which the MOC is providing MOC services).
- ~~10-11.~~ Each Market Participant shall ensure its information technology staff are available and have access to each remote site if technical issues occur.
- ~~11-12.~~ Remote operations shall not impair a Market Participant's ability to maintain control over its generation or transmission facilities and to carry out operating instructions issued by PJM.

~~12-13.~~ Market Participants shall update generator owner eDART contact survey information for primary and secondary contacts. In addition, any changes for dispatch phones and contacts for Client Managers shall be updated.

Redundancy Requirements in Remote Operations Sites

1. A standby or backup operator shall be available 24 hours per day/7 days per week in the event the primary operator cannot perform his or her duties at the remote control center for any reason. This standby operator shall comply with all requirements in this Attachment, and be ready to assume shift responsibility immediately when needed.

Cyber Security Requirements

1. The Market Participant shall adhere to all NERC Critical Infrastructure Protection (CIP) standards that are applicable to the Market Participant's NERC registration status unless an exception request has been approved by the applicable Regional Entity.
2. The remote operator's computer and other hardware shall be issued and configured by the MOC.
3. Assets shall be secured in accordance with the MOC's existing security policies, standards and procedure.
4. Web browsing from an operator's computer shall only occur when required to support functions necessary for the operation of the MOC.

Physical Security Requirements

1. While not in use, the remote operator's computer shall be locked, logged off, or turned off to reduce unauthorized use or access.
2. In general, the remote operator shall adhere to all Market Participant's internal company policies with regards to Physical Security.