

New proposed PJM Manual 14B Language to clarify the definition of a multiple circuit towerline. The highlighted text has been added given feedback after the August Planning Committee meeting.

2.3.4a Contingency Definitions

Contingency definitions used in RTEP analysis are the same as applicable NERC TPL contingency definitions. Where the physical design of connections or breaker arrangements results in the outage of more than the faulted equipment when a fault is cleared, the additional facilities were **also taken out of service** outaged in the contingency definition. For example, if a transformer is tapped off a line without a breaker, both the line and transformer are removed from service as a single contingency event.

Contingency definitions for **double circuit towerline** outages shall include any two or more adjacent (vertically or horizontally) circuits on a common structure but shall exclude circuits that share a common structure or common Right-of-Way for one mile or less. ~~The number of circuits on the common structure may change the classification of the event from a planning to an extreme event.~~ **Common structures containing more than two circuits constitute a NERC extreme event.**

Proposed PJM Manual 14B edits to clarify the definition of a multiple circuit towerline.

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This review may suggest larger projects to collectively address groups of violations. The second is a thermal analysis including double circuit **towerline** outages at voltages exceeding 100 kV performed on the current year plus fifteen system. All of the current year plus fifteen results produced will be reviewed to determine if any issues may require longer lead time solutions. If so such solutions will be determined and considered for inclusion in RTEP.

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PJM uses a linear (DC) power flow program to analyze each facility for which PJM is responsible to determine whether any contingencies can overload the facility (including comprehensive flowgate analysis of single, **double circuit towerline**, bus, and stuck breaker contingencies.) i.e., the program examines each PJM flowgate (contingency / monitored element pair) on the entire PJM footprint. The procedure below explains conceptually how the program works; following the procedure below would yield the same results as the program. The procedure uses a load flow set up according to step 2.

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In addition to single contingencies, PJM planning criteria requires that the PJM system withstand certain common mode outages. These outages include line faults coupled with

a stuck breaker, double circuit towerline outages, faulted circuit breakers and bus faults. PJM uses a procedure very similar to the generator deliverability procedure to study common mode outages. The list below highlights the other details of the common mode outage procedure that differ from the generator deliverability procedure.

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PJM reliability planning criteria requires that the system be tested for all BES single contingency outages and all common mode outages. Common mode outages consist of line faults coupled with a stuck breakers that result in multiple facility outages, double circuit towerline outages and bus faults in the PJM system. PJM's planning procedures require all NERC category A, B, and C conditions be tested.