

**PJM Response to Monitoring Analytics presentation at 01/11/2019 EPFTSF (available at <https://pjm.com/-/media/committees-groups/task-forces/epfstf/20190111/20190111-item-04c-imm-calculation-of-forced-outage-probability.ashx>)**

### **PJM General Comments**

The ideal approach to capture the uncertainty due to forced outages of thermal units in the ORDCs would be to identify the set of units likely to serve load in each SCED case (every 5 minutes), then the forced outages distribution in MWs could be developed by using the individual forced outage rates of such units and the load in the SCED case.

The above approach is feasible. However, adopting such an approach would prevent PJM from posting the ORDCs beforehand (at the beginning of each year, for instance). Instead, the ORDCs would be dynamic, changing every 5 minutes.

PJM's proposed approach represents a trade-off between providing the ORDCs in advance to stakeholders and using a workable and reasonable estimate of the forced outages of thermal units.

### **Specific responses to Monitoring Analytics comments**

#### **MA Comment**

In Slide 2, Monitoring Analytics states:

"This will overstate the forced outage MW and the ORDC."

#### **PJM Response**

This is a conclusion that PJM invites the MA to provide data to support. The PJM approach assumes that for each of the 24 ORDCs the set of online units will reflect the pattern of forced outage rates of the entire fleet. This is a reasonable assumption considering that,

- The PJM system has more than 1,000 units. This reduces the impact that a single unit or a set of units has on the overall forced outage rate.
- The average forced outage rate for 30 minutes using the proposed PJM approach is 0.25%, a rather small quantity (in the 200-300MW range).
- The PJM approach considers multiplying the forced outage distribution (in % terms) by the historical average load for each season/time block to derive the forced outage distribution in MW. Using the historical average load is likely to understate/overstate future loads half of the time.

#### **MA Comment**

In Slide 4, Monitoring Analytics states:

"The forced outage MW distribution should reflect the actual generator mix for each time block rather than assuming that all generators are online all the time."

**PJM Response**

It is not clear what MA refers to as the “actual generator mix for each time block”. If it refers to the set of units likely to serve load in each SCED case every 5 minutes, then PJM agrees with the statement but the ORDCs could not be posted beforehand (see PJM General Comments above). If MA is referring to hypothesizing about the set of units that is likely to serve load in each of the 24 season/time block, then PJM believes that there is not much to be gained from such an approach (assuming this approach could be developed) because of the 3 bullet points mentioned in the previous response.

**MA Comment**

In Slide 4, Monitoring Analytics states:

“PJM needs to provide additional information on the derivation of the Mean Time to Failure parameter”

**PJM Response**

Time period used: identical to the time-period used for other forecast errors (most recent 3 calendar years)

Treatment of generators with limited operating history (new or new to PJM): if a unit is new and does not have any GADS data, PJM will not include the unit in the analysis. If a unit has limited operating history (less than 3 years), then PJM will estimate the Mean Time to failure with the available data.

Treatment of retired units: considering the fact that deactivation requests can be withdrawn, PJM will include future retirements in the calculation.