NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Divergence Between PJM/NE-ISO/MISO and NERC GADS

GADS Data Reporting Workshop

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Divergence between PJM/NE-ISO/MISO and NERC GADS

Differences:

- Net vs. Gross Capacity
- Calculation of Equivalent Hours
- Outside Management Control Cause Code
- Outside Management Control Startup Count
- Cross-Year Events
- Additive vs. Dominant Events
- EFORd Calculation

Net vs. Gross Capacity

NERC:

- Accepts and applies both gross and net capacity

PJM/NE-ISO/MISO:

- Accepts and applies only net capacity
- Gross capacity is accepted and passed along to NERC but not used in any calculation

Calculation of Equivalent Hours

NERC:

$$\text{Eq. Hrs} = \frac{(\text{Duration of Derate}) \times (\text{Size of Reduction})}{\text{Net Maximum Capacity}}$$

PJM/NE-ISO/MISO:

$$\text{Eq. Hrs} = \frac{(\text{Duration of Derate}) \times (\text{Size of Reduction})}{\text{Net Dependable Capacity}}$$

Size Of Reduction = determined by subtracting the Net Available Capacity (NAC) from the Net Dependable Capacity (NDC)

Outside Management Control Cause Codes

NERC/NE-ISO/MISO:

A full list of OMC cause codes can be found in Appendix K of the NERC GADS DRI

PJM:

PJM may reject the use of OMC cause code on a case-by-case basis

Outside Management Control Startup Count

NERC OMC Calculation:

When a full OMC event is removed during calculation, the count of starts at the end of the event is reduced accordingly

PJM/NE-ISO/MISO OMC Calculation:

When a full OMC event is removed during calculation, the count of start at the end of the event is left as-is

Cross-Year Events

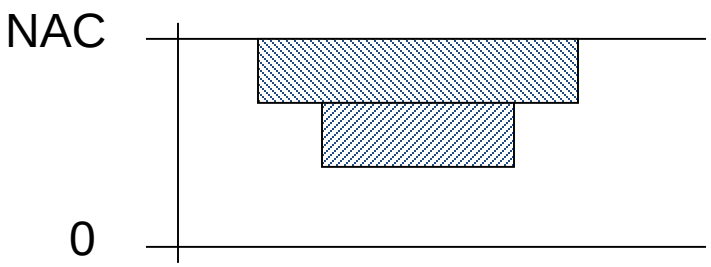
NERC:

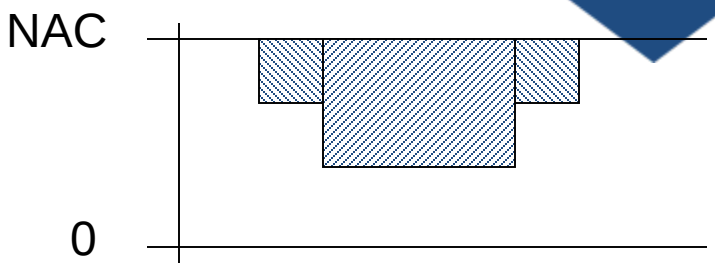
Events must end at the end of the year

PJM/NE-ISO/MISO:

Events can stay open across different years

Additive vs. Dominant Events





NERC/MISO:

All derates are additives by Default

User has the option to indicate which derate is dominant

NE-ISO/PJM:

All derates are additives by Default

User does not have the option to indicate which derate is dominant.

Reason:

1) **Easy to Interpret**
2) **Prevent Abuse (hiding forced derate behind non-forced derate)**
3) **Stay consistent with real-time outage reporting system (eDART) for cross-check validation**

EFORd Calculation

NERC:

$$EFORd = \frac{FOHd + (EFDHd)}{SH + FOHd} \times 100\%$$

where

FOHd = f x FOH

EFDHd = (EFDH – EFDHRS) if reserve shutdown events reported, or
(fp x EFDH) if no reserve shutdown events reported

fp=Partial F-Factor = (SH/AH)

f =F-Factor = (1/r + 1/T) / (1/r + 1/T + 1/D)

r = Average Forced outage deration = (FOH) / (# of FO occurrences)
D = Average demand time = (SH) / (# of unit actual starts)
T = Average reserve shutdown time = (RSH) / (# of unit attempted starts)

PJM/NE-ISO/MISO:

$$EFORd = \frac{FOHd + (EFDHd)}{SH+\text{Synch Hour}+FOHd} \times 100\%$$

where

FOHd = f x FOH

EFDHd = (fp x EFDH) (regardless of reserve shutdown events reported or not)

fp=Partial F-Factor = (SH+Synch Hour /AH)

f =F-Factor = (1/r + 1/T) / (1/r + 1/T + 1/D)

r = Average Forced outage deration = (FOH) / (# of FO occurrences)
D = Average demand time = (SH+Synch Hour) / (# of unit actual starts)
T = Average reserve shutdown time = (RSH) / (# of unit attempted starts)

EFORd Calculation

NERC:

"Typically performance indexes are calculated using performance data over at least a year. However, if any of the variables SH, FOH, or RSH is zero in a period, one practice has been to assign a default value of 0.001 for computing indexes. Similarly, if any of the variables "number of FOH occurrences", "number of attempted starts", or "number of actual starts" is zero in the period, a value of 1 is assigned for computing indexes. The default values can give meaningless indices in some cases as indicated in Table H-1. Discretion based on history and other factors may be used to estimate FORd and EFORd even if they can be calculated using the equations in the standard in some cases".

PJM/NE-ISO/MISO:

If reserve hours < 1 Then f =1
Else if (SH + Synch Hours) = 0 Then f = 1
Else if (1/r + 1/T + 1/D) = 0 Then f = 0
Else if # of FO occurrences = 0 or FOH = 0 Then 1/r = 0
Else if RSH = 0 or # of unit attempted starts = 0 Then 1/T = 0
Else if # of unit actual starts = 0 or (SH + Synch Hours) = 0 Then 1/D = 0
Else if (SH+RSH+Synch Hours) = 0 Then fp = 0
Else if ((SH + Synch Hours) + (f x FOH)) = 0 Then EFORd = 0