

KyPSC Case No. 2024-00158
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DATA REQUEST

WITNESS

TAB NO.

STAFF-DR-02-001

Jeff O. Turner.....1

VERIFICATION

STATE OF OHIO)
)
COUNTY OF HAMILTON) SS:

The undersigned, Jeff Turner, Principal Engineer, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing data requests and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Jeff Turner
Jeff Turner Affiant

Subscribed and sworn to before me by Jeff Turner on this 24th day of September, 2024.

Emilie Sunderman
NOTARY PUBLIC

My Commission Expires: July 8, 2027



EMILIE SUNDERMAN
Notary Public
State of Ohio
My Comm. Expires
July 8, 2027

Duke Energy Kentucky
Case No. 2024-00158
STAFF's Second Set Data Requests
Date Received: September 18, 2024

STAFF-DR-02-001

REQUEST:

Refer to Duke Kentucky's response to Commission Staff's First Request for Information (Staff's First Request), Item 3. Explain whether, by existing industry standards, three terminal transmission configurations are not optimal as compared to two terminal transmission configurations and whether, for reliability purposes, two terminal configurations are recommended.

RESPONSE:

Three terminal lines compromise reliability. While different companies may have different philosophies and practices, it is generally accepted throughout the electric power industry that three-terminal line configurations can and do present challenges in the following areas:

- 1) In terms of system protection (detection and clearing of faults on the system), including: sequential clearing for transmission line faults; compromises in the ability of the protection to detect faults; compromises in relay coordination between the three-terminal line protection and the protection on adjacent facilities; increased complexity of associated communications systems; and increased susceptibility to false tripping or over-tripping.
- 2) In terms of operation due to increased switching complexity for isolation, maintenance, and/or restoration of facilities.
- 3) In terms of reliability due to the number of system facilities impacted by events on the lines, i.e., an event on a three-terminal line will impact more

equipment than a similar event if the same facilities were configured and served by two two-terminal lines.

Not all three-terminal configurations will necessarily exhibit all of the above issues and their use may be appropriate in some circumstances. In this case, the proposed project will alleviate issues in each of the areas for the portion of the Duke Energy Kentucky system that the proposed project will reconfigure.

PERSON RESPONSIBLE: Jeff O. Turner