VERIFICATION

STATE OF NORTH CAROLINA)
) **SS:**
COUNTY OF MECKLENBURG)

The undersigned, Brad Daniel, Director, Generation Dispatch and Operations, 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.

Brad Daniel, Affiant

Subscribed and sworn to before me by Brad Daniel on this 22 day of November, 2022.

NOTARY PUBLIC

My Commission Expires:

SHAMALE M WILSON
Notary Public, North Carolina
Mecklenburg County
My Commission Expires
July 06, 2026

VERIFICATION

STATE OF NORTH CAROLINA)

) **SS:**

COUNTY OF ~~MECKLENBURG~~)
Lincoln

The undersigned, Jim McClay, Manager Director Natural Gas Trading, 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.

Jim McClay

Jim McClay, Affiant

Subscribed and sworn to before me by Jim McClay on this 18th day of November, 2022.

WENDY J. HEAFNER
NOTARY
PUBLIC
LINCOLN COUNTY, NC

Wendy J. Heafner

NOTARY PUBLIC

My Commission Expires: 10/30/2027

KyPSC Case No. 2022-00267
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STAFF-DR-03-001

REQUEST:

Refer to the Direct Testimony of Jim McClay (McClay Testimony), page 5, lines 18-23, and page 6, lines 1-8, and Duke Kentucky's response to Commission Staff's Second Request for Information (Staff's Second Request), Item 2.

a. Referring to Item 2a, explain whether the DEOK zone is constrained due to a lack of generation or transmission capacity or both.

(1) If it is a lack of generation capacity, explain what other entities reside in the DEOK zone and, if known, which entity is generation short.

(2) If it is a lack of transmission capacity, explain if known, the location(s) of the transmission constraint and what is currently being done to alleviate the constraint.

RESPONSE:

a. (1) The Company does not have the knowledge if the DEOK zone is constrained by lack of generation. The Company does not know the position of other entities within DEOK zone.

(2) In compliance with the FERC Code of Conduct, the regulated marketing side of the Company does not have access to any detailed improvement plans to alleviate the constraint. The publicly available list of RTEP upgrades (https://www.pjm.com/planning/project-construction) generally points to improvement in

Pierce area in 2021. According to PJM BRA auction data, the following are the limiting constraints to the DEOK LDA.

- For 2022/2023 BRA, the limiting constraints are Pierce – Foster 345 kV for the loss of Miami Fort – Tanner's Creek 345 kV circuit and Pierce 345/138 kV transformer #18 for the loss of the Pierce – Foster 345 kV circuit.
- For 2020/2021 BRA, the limiting constraint is Tanner – Miami Fort 345 kV line for the loss of the Terminal – South Bend 345 kV line.

PERSON RESPONSIBLE: Jim McClay

Duke Energy Kentucky
Case No. 2022-00267
STAFF Third Set Data Requests
Date Received: November 9, 2022

STAFF-DR-03-002

REQUEST:

Refer to Duke Kentucky's response to Staff's Second Request, Item 2b. The following portion of the response is not clear: "However, if additional generation were needed in the future, this requirement as well [as] the amount of additional generation inside DEOK could affect the amount of capacity available in the market to satisfy future Company FRR plan."

a. Assuming Duke Kentucky built or acquired additional generation outside the DEOK zone, presumably the Company would have sufficient transmission capacity to supply that capacity and energy to its service territory customers. Explain whether the fixed resource requirement (FRR) plan requires Duke Kentucky to have sufficient generation to serve its own customers.

b. As a regulated electric utility in Kentucky, explain whether Duke Kentucky has an obligation to maintain sufficient generation capacity to enable it to serve customers in its service territory and whether this conflicts in any way with its PJM obligations as an FRR plan entity.

c. Explain how the DEOK zone is constrained if Duke Kentucky has a generation facility outside the DEOK zone and has sufficient transmission capacity to provide that capacity and energy to its service territory customers.

d. In the instance where Duke Kentucky has generation facilities outside the DEOK zone and sufficient transmission capacity and the PJM generation location requirement is satisfied in one year, but not satisfied in the following year, explain what actions will be taken by PJM and/or Duke Kentucky.

e. As an FRR entity, explain why and how "the amount of capacity available in the market to satisfy future Company FRR plans" is relevant to Duke Kentucky.

RESPONSE:

a. The FRR plan requires the Company to have sufficient generation to serve its capacity load obligation. In addition, the Company must also satisfy Percentage Internal Minimum Requirement (PIRR) in DEOK Local Deliverability Area (LDA) since DEOK is being separately modeled in the BRA. The percentage of PIRR varies from year to year as seen below.

Delivery Year	BRA PIRR	1st IA PIRR	2nd IA PIRR	3rd IA PIRR
o 2020/2021	41.7%	42.2%	41.7%	39.3%
o 2021/2022	44.7%	43.9%	41.8%	42%
o 2022/2023	33.9%	N/A	N/A	24.6%
o 2023/2024	22.1%	N/A	N/A	
o 2024/2025	34%			

b. As a regulated electric utility in Kentucky, Duke Energy Kentucky has an obligation to maintain sufficient generation capacity to enable it to serve customers in its service territory. There is no conflict with its PJM obligations as an FRR plan entity.

c. Duke Energy Kentucky's FRR plan must provide sufficient capacity resources located inside the LDA to meet the PJM minimum internal resource requirement. This ensures internal committed capacity plus available transfer capability can meet DEOK's LDA reliability requirement. In the RPM auction, PJM enforces the same LDA reliability requirement for DEOK. If DEOK relied too heavily on the external capacity to meet the reliability requirement, it would not comply with the minimum internal resource requirement. There would be too much external economic capacity resource to meet DEOK's LDA requirement. By enforcing the import capability of the DEOK zone, PJM would clear more expensive internal resources in DEOK—as opposed to external resources—in order to meet the LDA reliability requirement.

d. Every RPM auction, PJM will update the Percentage Internal Minimum Requirement (PIRR) for the FRR plan. The Company will need to update its FRR plan by adjusting the amount of resources within the DEOK zone to meet the PIRR requirement. PJM enforces the PIRR requirement of the FRR plan. PJM will disallow the portion of capacity in the FRR plan that does not meet the PIRR requirement, i.e. will decline to count that portion of capacity towards the FRR plan. Thus, the Company would need to update its FRR plan accordingly. This might mean that the Company will need to secure additional capacity from within DEOK LDA. To date, the Company has met the PIRR requirement for all FRR plans since PJM calculated the PIRR requirement since the 2020/2021 delivery year.

e. The Company uses the capacity bilateral market to meet its FRR plan needs from time to time. Please see pages 6-7 of the Direct Testimony of Jim McClay previously filed in this matter regarding how the capacity market is used.

PERSON RESPONSIBLE: Jim McClay

STAFF-DR-03-003

REQUEST:

Refer to Duke Kentucky's response to Staff's Second Request, Item 4. Describe and explain the circumstances under which a generation unit's output would be reduced or suspended for reliability. Include in the response the general circumstances under which that would occur and the specific circumstance(s) as applied to Duke Kentucky's units.

RESPONSE:

A unit's output could be reduced or suspended for reliability at the request of PJM due to a transmission constraint or other reliability issue that could cause a manual redispatch of PJM's system. These are abnormal system events, as system congestion is typically managed through LMP. Though Duke Energy Kentucky does keep hourly logs for generation dispatch records, those logs do not detail specific generation dispatch occurrences or circumstances as they pertain to specific PJM billing items.

PERSON RESPONSIBLE: Brad Daniel

STAFF-DR-03-004

REQUEST:

Refer to Duke Kentucky's response to Staff's Second Request, Item 5.

a. Explain whether Duke Kentucky's units are offered into the PJM Day Ahead Market as Must-Run as a matter of course and whether the units are ever offered into the market with an Economic offer.

b. In light of the tight coal market and higher prices and greater uncertainty regarding reliable coal supplies, explain whether coal units are more likely to be offered into the Day Ahead Market with Economic offers in an effort to slow the pace of coal pile consumption.

c. In the situation where Duke Kentucky offers its units into the Day Ahead Market with an Economic offer and does not receive awards, explain whether the units still receive PJM revenues, and if so, explain what service revenues, including billing line items, are received.

d. In the situation where the unit was offered into the Day Ahead Market with an Economic offer and did not receive an award, Duke Kentucky would take the unit offline. In that instance, explain whether the unit would be consuming coal or not.

e. In the situation where the unit was offered into the Day Ahead Market with a Must Run offer and did not receive an award, it would be online in the Real Time market running at its minimum dispatchable load. In that instance, explain what PJM service revenues, including billing line items, are received.

RESPONSE:

a. When available, Duke Energy Kentucky's coal unit, East Bend, is typically offered into the PJM Day-Ahead Market with a Must Run offer status to best optimize the unit's availability for dispatch in PJM. However, there are times that warrant offering the East Bend unit with an Economic status. When available, the Company's Woodsdale units are typically offered with an Economic status into the Day-Ahead Market unless there is an operational necessity to commit the unit as Must Run, such as for unit testing.

b. Historically, Duke Energy Kentucky's coal unit, East Bend, has competed favorably in the PJM market and when available, has typically been offered into the Day-Ahead Market with a Must Run offer status. In the past few years, there have been instances where the revenues that would have been received were projected to be less than the units' variable costs, the unit was able to potentially be de-committed or remain off-line and was thus offered with an Economic commitment status in the Day-Ahead Market to PJM. However, during this FAC period, Duke Energy Kentucky did not experience any of those instances and the unit was offered as Must Run when available into the Day-Ahead Market.

To date, the Company has not utilized an Economic status for East Bend into the PJM Day-Ahead Market for the reason of "greater uncertainty regarding reliable coal supplies". The Company uses the replacement (market) price of coal delivered to East Bend for purposes of supply offers to PJM. The Company has responded effectively and dynamically to changing market conditions with the Company's forward modeling process also utilizing up-to-date spot and future commodity and power prices, along with actual and expected coal deliveries, to project coal burn and coal inventory. By closely monitoring actual and projected coal burns and inventories and supply chain performance, the

Company has been able to respond proactively to coal commodity and transportation market supply chain constraints. In the future, the Company may see a need to modify the coal prices used for dispatch to utilize more of a dynamic approach to dispatch and commitment to account for constraints to best balance dispatch economics in a coal constrained environment while also accounting for retaining a reliable amount of coal inventory for future periods. This includes potentially offering the unit into the PJM Day Ahead market with an Economic status.

c. In relation to East Bend station, in the situation where Duke Energy Kentucky offers the unit into the Day Ahead Market with an Economic offer and does not receive a Day Ahead award, the unit can stay online in the Real-Time Market or can be de-committed offline.

In relation to Woodsdale station, in the situation where Duke Energy Kentucky offers the unit into the Day Ahead Market with an Economic offer and does not receive a Day Ahead award, the unit can be turned online in the Real-Time Market or can be de-committed offline. Note that there are additional ancillary service awards that can be received by a unit being offline, most notably PJM Billing Line Item ("BLI") #2366 (Day-Ahead Scheduling Reserves) and #2380 (Blackstart Service). These BLI can be received by the Woodsdale units without the unit's operating.

Most energy and ancillary service revenues received from PJM depend on whether the unit is online or offline. In most instances, a unit must either be running or receive a Day-Ahead award in order to receive PJM Billing Line Items (BLI) related to energy and ancillary services. With regards to PJM BLI that are impacted by energy or ancillary service awards, these include BLI #1200, 1205, 1210, 1215, 1220, 1225, 1303, 2320, 2330, 2340, 2360, 2361, 2366, 2367, 2368, 2370, 2375, and 2380.

d. Assuming the question is related to East Bend station, in the situation where the East Bend was offered into the Day Ahead Market with an Economic offer and did not receive an award and the unit is not online, the unit would not be consuming coal.

e. Assuming the question is related to East Bend station, in the situation where the unit was offered into the Day Ahead Market with a Must Run offer, the unit will receive a Day Ahead award because of its Must Run offer. The unit will then be dispatched at least at its minimum dispatchable load. Please see part (c) above for a list of energy and ancillary service charges and credits, including PJM Billing Line Items, that could be associated with receiving an award related to an energy or ancillary service award for a generator.

PERSON RESPONSIBLE: Brad Daniel