COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In The Matter of:

The Application of Duke Energy Kentucky, Inc., for a Certificate of Public Convenience and Necessity for Construction of a Number 2 Distillate Fuel Oil System at the Company's Woodsdale Natural Gas-Fired Generating Station	))))))	Case No. 2017-00186

APPLICATION OF DUKE ENERGY KENTUCKY, INC.,
FOR CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

Now comes Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company), pursuant to KRS 278.020 and 807 KAR 5:001 Section 15 Duke Energy Kentucky requests that the Commission grant a Certificate of Public Convenience and Necessity (CPCN) for the Company to construct and install a ultra-low sulfur diesel (ULSD) distillate fuel oil system at the Company's Woodsdale Natural Gas-fired Combustion Turbine Generating Station (Woodsdale) site (ULSD Fuel System) as an alternate fuel source to natural gas, and retire the existing on-site propane system equipment that is no longer usable and sufficient to meet the newly enacted and soon to be enforced Capacity Performance (CP) requirements of PJM Interconnection LLC (PJM). PJM's CP rules, which reform PJM's Reliability Performance Model (RPM), create significant risk that Woodsdale, in its present fuel configuration, will not be accepted as a resource for Duke Energy Kentucky to meet its obligation as a PJM Load Serving Entity (LSE) beginning June 1, 2019.

The CP rules provide broad discretion on the part of PJM and the Independent Market

Monitor (IMM) to challenge generators as being CP compliant. While the Company's East Bend coal-fired generating station (East Bend) is situated such that it has sufficient fuel availability with onsite storage to qualify as CP compliant, Woodsdale does not. Absent modifications to the Woodsdale facility, the Company would no longer be able to count on Woodsdale to meet its PJM capacity requirements beginning in June 2019. The Company would thus face a 462 Megawatt (MW) capacity shortfall for its fixed resource requirement (FRR) obligation that would need to be remedied through bilateral market purchases of additional unit-specific CP compliant capacity just to continue meeting its load obligations in PJM. The Company has examined multiple strategies to meet this new requirement in has determined that the proposed dual fuel system represents the least risk to customers and the Company to avoid potentially expensive capacity shortfalls and mitigate exposure to significant compliance non-performance assessments.

Duke Energy Kentucky must meet PJM's CP requirements at generating stations committed to serve customer load by June 1, 2019. The Company thus needs to have the ULSD Fuel System in place and fully operational by that time.

Introduction

1. Duke Energy Kentucky is a Kentucky corporation with its principal office and principal place of business at 139 East Fourth Street Cincinnati, Ohio 45202. The Company's local office in Kentucky is Duke Energy Envision Center, 4580 Olympic Boulevard, Erlanger, Kentucky 41018. The Company further states that its electronic mail address for purposes of this matter is KYfilings@duke-energy.com.

2. Duke Energy Kentucky is a utility engaged in the gas and electric business. Duke Energy Kentucky purchases, sells, stores and transports natural gas in Boone, Bracken,

Campbell, Gallatin, Grant, Kenton and Pendleton Counties, Kentucky. Duke Energy Kentucky also generates electricity, which it distributes and sells in Boone, Campbell, Grant, Kenton and Pendleton Counties.

3. Pursuant to 807 KAR 5:001, Section 14(2), Duke Energy Kentucky states that it was originally incorporated in the Commonwealth of Kentucky on March 20, 1901, and attests that it is currently in good standing in said Commonwealth.

Background

4. On or about December 5, 2003, in Case No. 2003-00252, the Commission approved Duke Energy Kentucky's acquisition of three generating stations from Duke Energy Ohio; East Bend, Miami Fort Unit 6[1] and Woodsdale. Effective January 1, 2006, Duke Energy Kentucky completed the acquisition of these three generating stations.

5. East Bend includes a single 600 Megawatt (MW), net capacity, coal-combustion generating unit and is Duke Energy Kentucky's only base load and coal-fired resource in its portfolio.

6. Woodsdale is a six-unit combustion turbine (CT) station located in Butler County, Ohio, just north of Cincinnati, with a collective net winter capability of 564 MW and a net summer capability of 492 MW (including inlet cooling). Woodsdale is designed for peaking service, and it has previously been equipped with dual fuel capability (natural gas and propane) and black start capability. Black start capability means that the station has the ability to initiate a recovery of a substantial portion of load without relying on energy from outside sources if the regional grid experiences a blackout. The black start capability is initiated by an Allison 501-KB gas turbine that serves as a back-up power source and allows the station to start generating energy without power from the electric grid. Woodsdale is connected to two separate gas

[1] The Miami Fort Unit 6 generator retired effectively May 31, 2015.

transmission companies, Texas Eastern Transmission Company (TETCO) and Texas Gas Transmission Company that transport the natural gas to supply the station.

7. Together, East Bend and Woodsdale are the Company's only owned sources of generation used to meet its Kentucky load obligations.

8. Previously, Woodsdale had a backup propane fuel supply for its six (6) units that were sourced from local propane caverns in the vicinity of the Woodsdale campus. These caverns were owned and operated by a third party, and not by Duke Energy Kentucky or its affiliates. In late 2013, Duke Energy Kentucky was informed that these caverns were going to be decommissioned by their owner, with no provision to make these caverns active again.[2] As a result, Woodsdale no longer has ready access to a sufficient amount of propane to use as an alternative fuel source. With the incipient PJM CP rules and the potential for significant market non-performance assessments, a reliable backup fuel system is needed.

PJM MARKETS AND THE FERC-APPROVED CHANGES NECESSITATING INVESTMENT

Participation in PJM

9. PJM's capacity market is called RPM, which is an acronym for Reliability Pricing Model. The purpose of RPM is to provide a market construct that enables PJM to secure adequate generation resources to meet the reliability needs of the regional transmission organization (RTO). The RPM construct and the associated rules regarding how PJM members participate in the PJM capacity market is described within the PJM Open Access Transmission Tariff (OATT) and Reliability Assurance Agreement (RAA).[3]

10. The PJM capacity market operates on a planning period that spans twelve months beginning June 1st and ending May 31st of each year (Delivery Year). In PJM, the capacity

[2] http://www.pjm.com/media/documents/merged-tariffs/oatt.pdf
[3] http://www.pjm.com/media/documents/merged-tariffs/raa.pdf

market structure is intended to provide transparent forward market signals that support generation and infrastructure investment. There are two ways for a PJM member to participate in the RPM capacity structure: 1) through the RPM baseline procurement auctions; or 2) as a self-supply fixed resource requirement (FRR) entity. The baseline procurement auction for capacity is called a base residual auction (BRA). BRAs are conducted approximately three years in advance of the actual Delivery Year in order to allow bidders to complete construction of projects that clear the BRA. The PJM capacity market is designed to provide incentives for the development of generation, demand response, energy efficiency, and transmission solutions through capacity market payments.

11. Duke Energy Kentucky is an FRR entity in accordance with the Commission's directive in Case No. 2010-00203.[4] As an FRR entity in PJM, Duke Energy Kentucky must annually submit a preliminary three-year forward, and a final current year FRR capacity plan that meets a PJM defined customer capacity obligation (FRR Plan). The FRR Plan must identify the unit-specific generating or demand response resources that will be providing the MWs of capacity that will fulfill the Company's customer obligation. The FRR process allows Duke Energy Kentucky to match its customer reliability requirement to its own generation, demand response, energy efficiency and/or transmission resources, while still being permitted to sell some or all of its excess supply into RPM. Currently Duke Energy Kentucky believes that the FRR construct best serves customer interests. Duke Energy Kentucky faces severe financial risk and limitations on its ability to choose the FRR option if PJM were to deem either its initial or

[4] *In the Matter of the Application of Duke Energy Kentucky, Inc., for Approval to Transfer Functional Control of its Transmission Assets from the Midwest Independent Transmission System Operator to the PJM Interconnection Regional Transmission Organization and Request for Expedited Treatment,* Case No 2010-00203, (Ky.P.S.C. Dec. 22, 2010) at 18.

final FRR plans to be insufficient or its generation otherwise non-compliant with PJM requirements.

Implementation of PJM'S CP

12. During the 2014 Polar Vortex, forced outage rates exceeded 20% in PJM's overall footprint. PJM determined the drivers behind these outage rates to be mechanical outages due to extreme cold and demand or weather driven fuel unavailability. Accordingly, PJM filed with FERC, and was approved to implement, changes to its capacity market through new CP rules embedded in the RAA that will ultimately be applied to all generation in the PJM footprint. PJM's purpose in implementing CP is to increase reliability expectations of capacity resources with a new Capacity Performance product intended to result in larger capacity performance payments for the most reliable resources (including performance bonuses for over-performing participants) and higher non-performance assessments for assets that do not meet performance expectations. PJM also is changing energy market rules regarding operating parameters, *force majeure* and generator outages under what it has described as a "no excuses" construct designed to enhance and ensure generation availability through the threat of substantial non-performance assessments by assets.[5]

13. The CP market changes were phased in beginning with the 2018/2019 and 2019/2020 delivery year BRA auctions, through which PJM procured at least 80% of capacity procured through its auction as CP compliant. PJM also held transitional auctions for the 2016/2017 Deliver Year and the 2017/2018 Delivery Year, targeting 60% and 70% CP capacity respectively. As an FRR entity, Duke Energy Kentucky will be required to attest that 80% of the capacity committed to its FRR plan is CP compliant for the 2019/2020 Delivery Year. The

[5] http://pjm.com/~/media/about-pjm/newsroom/2016-releases/20160524-rpm-auction-results-for-2019-2020-news-release.ashx

transition to full CP compliant capacity, which also applies to Duke Energy Kentucky as an FRR entity, will be complete for 2020/2021, when PJM expects 100% of capacity to be Capacity Performance resources.

14. When PJM achieves full transition to CP for the 2020/2021 Delivery Year, every resource in the footprint not on an approved planned outage will be obligated to be available for PJM dispatch during any hour that PJM deems a compliance hour throughout the entire delivery year.

15. The CP construct is a substantial rewrite to the existing PJM capacity market design, fundamentally altering and substantially increasing the financial risk exposure resulting from the operational performance of a member's generation fleet, which includes Duke Energy Kentucky's East Bend and Woodsdale stations. In order to maintain its status as an FRR entity or even transition to a full auction procurement participant, all generation committed to meeting load must comply with the minimum CP requirements set by PJM. The "no excuses" non-performance assessments enforced by PJM under CP would include a situation where Woodsdale Station could be under a natural gas curtailment in which fuel would not be available to operate the units for load during these times. The CP periods will not exempt units from being available due to shortages of natural gas in the region. The Company has, in fact, previously experienced operational limitations imposed by the pipeline serving Woodsdale with respect to gas scheduling and usage that could impact gas availability during CP compliance events.[6] Duke Energy Kentucky does not have firm gas transportation for Woodsdale, principally because the station is designed to run only intermittently, and procuring firm gas supply is prohibitively expensive considering the limited times that it would be utilized. If the station were under a gas

[6] *See e.g., In the Matter of an Investigation of Duke Energy Kentucky, Inc.'s Accounting Sale of Natural Gas Not Used in its Combustion Turbines,* Case No. 2014-00078 (Ky.P.S.C. Nov. 24, 2014); addressing the Company's experience with operational flow restrictions during the 2014 Polar Vortex.

curtailment situation and PJM issues a CP compliance notice, Woodsdale would be at risk for incurring severe non-performance assessments.

16. Similarly, under the RAA, Duke Energy Kentucky must commit sufficient capacity to meet its load obligation in the April three years prior to the PJM Planning Year. If PJM were to reject the proposed capacity plan, the Company would be subject to a penalty of two (2) times the current planning year Net Cost of New Entry (CONE) multiplied by the number of megawatts the Company is deemed to be short of compliance. Specifically, in April 2017, the Company submitted its next capacity plan, for the year starting June 1, 2020. The FRR Plan included 462 MWs of Woodsdale capacity. If Woodsdale were to be rejected as a compliant resource, the penalty for a 462 MW shortfall would be roughly $133 Million for the 2020/2021 Planning year.

17. Given PJM's and the IMM's authority to question our resource as being CP compliant, and with the significant penalties associated with the PJM not accepting the resource in the Company's FRR plan, doing nothing to ensure Woodsdale meets PJM's CP standard is not an option. The Company must take action to ensure that its generating portfolio will qualify as CP for the future and that its generating portfolio has sufficient ability to perform when called upon at that point.

The ULSD Fuel Proposal

18. PJM performed a historic calculation to determine the number of CP event days that would have occurred since 2011. PJM has identified a total of eight (8) days (3 days in January 2014) that Duke Energy Kentucky's Woodsdale would have been under a CP performance obligation. Considering event duration and potential resupply concerns, weather data suggests that a back-up fuel supply sufficient to operate the station for up to three days in

length is recommended to mitigate risks of CP performance events. The loss of the nearby propane caverns leaves Woodsdale with only a limited supply of propane that is currently stored on site. That limited supply is only sufficient to provide approximately five hours of operation. Once that fuel is consumed, there simply is no practicable way to acquire sufficient propane quickly enough or in sufficient quantity to continue operating the units at Woodsdale Station for a longer duration. Propane typically suffers similar constraints as natural gas during extreme weather events, making the possibility of refueling the station storage during a cold weather event highly unlikely. Based on this information, the Company is recommending designing the ULSD Fuel System as a ULSD fuel system that is capable of providing 72 hours of continuous operation at full load to mitigate exposure to PJM non-performance assessments.

19. The ULSD Fuel System project scope is to design, plan, construct, and commission a ULSD fuel system as a secondary fuel to natural gas for Woodsdale Station and retirement and demolish the existing propane secondary fuel system that is no longer viable due to the lack of operational ability to access propane fuel during a time of need because of the retirement of local propane caverns, the inability to acquire sufficient propane reserves during a time of need, and the limitations on feasibility of increasing onsite propane storage due to access and expense. The region surrounding Woodsdale lacks a readily available and sufficient supply of propane that is capable of refueling Woodsdale. The local transportation infrastructure and at the station is not suitable to accommodate the amount of vehicular traffic necessary to continuously supply propane to operate the station or refuel an onsite propane storage during a time of system emergency coinciding with a natural gas curtailment event.

20. The ULSD Fuel System includes equipment for unloading, storage, forwarding, and firing system for Woodsdale entailing fuel oil block hardware, burner modifications

hardware, CT fuel oil drain system hardware, fuel oil piping, fuel oil pumping equipment, all necessary fire protection and detection, instrument air, service air, foundations, fuel oil storage tanks, earthen berm oil containment with drainage and oil/water separator, roadwork and paving, storm water drainage, pre-engineered buildings with HVAC, electrical, heat trace, cathodic protection, instrumentation/controls and NERC CIP considerations. Removal of the existing propane boilers on each Woodsdale Unit to utilize the buildings for the new fuel oil blocks and oil preheaters.

21. The major fuel preparation and control components related to the existing propane system will be removed or included in demolition. Any propane piping or propane storage tanks not removed or not included in the demolition will be decommissioned per environmental standards, capped off, and evaluated for removal or abandonment. This includes the 4.1 mile propane supply pipeline from the Todhunter caverns to Woodsdale Station.

Request for Certificate of Public Convenience and Necessity

22. In accordance with 807 KAR 5:001 Section 12(2)(a)-(i), Duke Energy Kentucky is filing the following information in Exhibit 1, which is incorporated herein and made a part of this Application filed in this proceeding:

Exhibit 1 Page	**Description**	**807 KAR 5:001 Section Reference**
	Financial Exhibit	12(2)
1	Amount and kinds of stock authorized	12(2)(a)
1	Amount and kinds of stock issued and outstanding	12(2)(b)
1	Terms of preference or preferred stock	12(2)(c)
1	Brief description of each mortgage on property of Duke Energy Kentucky	12(2)(d)
2	Amount of bonds authorized and issued and related information	12(2)(e)
2	Notes outstanding and related information	12(2)(f)
2-3	Other indebtedness and related information	12(2)(g)

4	Dividend information	12(2)(h)
4-6	Detailed Income Statement and Balance Sheet	12(2)(i)

23. 807 KAR 5:001, Section 15 sets forth the requirements to receive a CPCN:

a. In accordance with Section 15(2)(a), the application herein describes the facts relied upon to show the ULSD Fuel System is required by public convenience or necessity and is necessary for the Company to continue to comply with federally approved requirements for PJM's newly implemented CP reliability construct. The ULSD Fuel System will allow Duke Energy Kentucky to continue to provide safe, reliable and reasonably priced retail electric service to customers by mitigating the potential for capacity shortfalls, purchase capacity replacement of complying unit-specific capacity, and the risk the forced early retirement of Woodsdale.

b. In accordance with Section 15(2)(b), the Company has previously filed with the Commission the applicable franchises from the proper public authorities. In addition, Exhibit 2 of this application includes a copy of the Title V air permit for Woodsdale. Construction of the ULSD Fuel System is permitted under this existing permit. Exhibit 3 is a copy of the concurrence letter from the Ohio Environmental Protection Agency (Ohio EPA) affirming that the station's existing Title V air permit sufficiently covers the ULSD Fuel System operation. Exhibit 4 is a copy of the Company's Application for a Permit to Install (PTI) the necessary ULSD fuel storage tanks at Woodsdale that was recently submitted to the Ohio EPA. The Company does not anticipate any issues with obtaining the PTI.

c. In accordance with Section 15(2)(c), which requires the Company to provide a full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner in which the facilities will be constructed, the Company states that the ULSD Fuel System construction will be performed at the Company's Woodsdale station located near Trenton in Butler County, Ohio. Exhibit 5 to this application contains Duke Energy Kentucky's Project Definition Report for the ULSD Fuel System prepared by Duke Energy Kentucky's outside engineering consultant (Report). The Report is stamped by a professional engineer licensed in the commonwealth of Kentucky and contains a detailed description of the need, construction, design, and location of the project. Exhibit 6 includes a copy the letter received from Enterprise TE Pipeline Products Company notifying Duke Energy Kentucky of the decommissioning of the Todhunter propane caverns.

d. In accordance with Section 15(2)(d)(1)-(2), requiring maps showing the location or route of the proposed construction or extension and plans and specifications and drawings of the proposed plant, equipment, and facilities, Duke Energy Kentucky respectfully states that the Report attached as Exhibit 5, includes the schematics and drawings of the Woodsdale site. Exhibits 5 and 7 also include an overhead map showing the proposed location of the construction activities for the ULSD Fuel System. Additionally, the Report contains the current plans, specifications, and drawings of the ULSD Fuel System. Because this construction will be

located at Duke Energy Kentucky's own facility, the construction of the new ULSD Fuel System will not compete with any other utilities, persons or corporations.

e. In accordance with Section 15(2)(e), the Company states that it proposes to finance the construction through continuing operations and debt instruments, as necessary.

f. In accordance with Section 15(2)(f), the fully loaded total estimated cost of ULSD Fuel System is approximately $55.4 million. Exhibit 8 contains a detailed cost estimate for the project construction. The estimated ongoing cost of operation for non-fuel related O&M once the project is completed is approximately $100,000 per year. The Company estimates the total yearly average of ULSD usage to be approximately 976,000 gallons/year. Depending upon the price of fuel, the Company anticipates an annual fuel expense of approximately $1.7 to $2 million per year.

Testimony and Exhibits

24. Additional facts supporting this Application are set forth in the following direct testimonies attached to this Application as Exhibits 9 through 13:

a. Joseph A. Miller, Jr. Vice President, Central Services provides an overview of the Company's electric generation operations and the project;[7]

b. John A. Verderame, Managing Director, Power Trading and Dispatch discusses the need for the ULSD Fuel System to meet PJM CP criteria, the risks to customers of non-compliance, and the analysis that was performed

[7] Exhibit 9.

to arrive at the conclusion that the ULSD Fuel System was the most reasonable strategy to meet that need in regards to balancing risks, quantifiable costs, and long-term viability of the station;[8]

c. Troy A. Wilhelm, Combustion Turbine (CT) Fleet Project Engineering Manager, Midwest Regional Services, discusses the project construction, estimated costs, and ongoing operation of Woodsdale and the ULSD Fuel System;[9]

d. Andrew Roebel, Senior Environmental Specialist supports the Company's permitting requirements to construct the ULSD Fuel System.[10]

e. William Don Wathen Jr., Director of Rates and Regulatory Strategy Ohio and Kentucky, discusses the estimated impacts to the Company's rates of the project.[11]

Requested Relief

WHEREFORE, Duke Energy Kentucky respectfully requests that the Commission expeditiously issue an Order grant the necessary CPCN.

[8] Exhibit 10.
[9] Exhibit 11.
[10] Exhibit 12.
[11] Exhibit 13.

VERIFICATION

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

The undersigned, Joseph A. Miller Jr., being duly sworn, deposes and states as follows:

1. I am employed by Duke Energy Business Services LLC (Duke Energy Business Services) as Vice President Central Engineering and Services. Duke Energy Business Services is a service company subsidiary of Duke Energy Corporation (Duke Energy), which provides services to Duke Energy and its subsidiaries, including Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company).
2. As Vice President of Central Engineering and Services, I have responsibility for and lead the groups responsible for the engineering analysis of capital projects across Duke Energy Corporation's fleet of fossil and hydroelectric generating facilities. My teams' responsibilities also include environmental compliance planning, assessment of new technologies, development of new fossil generation, and continuous emission monitor system maintenance support.
3. I earned a Bachelor's Degree in Mechanical Engineering from Purdue University in 1991 and completed twelve post-graduate level courses in Business Administration at Indiana State University. My career began at Public Service of Indiana in 1991 as a staff engineer at Cayuga Generating Station. Since that time, I have held various positions of increasing responsibility, including Station Manager at Cinergy's East Bend Generating Station and Duke Energy Ohio's Zimmer Generating Station. In October 2010, I was promoted to General Manager of Analytical and Investments Engineering. I was

promoted to General Manager of Strategic Engineering in July 2012, following the merger between Duke Energy and Progress Energy, Inc. In February 2014, I served as Interim Vice President of Central Engineering and Services and I was promoted to my current position as Vice President of Central Engineering and Services in October 2014.

4. I have personal knowledge of the matters set forth in the foregoing Application and the information contained therein is true and correct to the best of my knowledge, information, and belief.

DUKE ENERGY KENTUCKY

By: _____
Joseph A. Miller Jr., Affiant
Vice President Central Engineering and Services,
Duke Energy Business Services, LLC

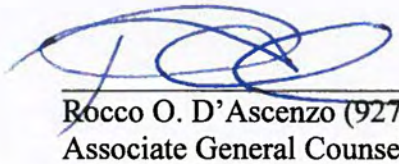
Subscribed and sworn to before me by Joseph A. Miller Jr., Vice President of Central Engineering Services for Duke Energy Business Services on this 31st day of May, 2017.

EVELYN G ROSEMAN NOTARY PUBLIC MECKLENBURG COUNTY, NC

Evelyn G Roseman
NOTARY PUBLIC

My Commission Expires: Aug 18, 2019

Respectfully submitted,



Rocco O. D'Ascenzo (92796)
Associate General Counsel
Amy B. Spiller (85309)
Deputy General Counsel
Duke Energy Business Services, LLC
139 East Fourth Street, 1313 Main
Cincinnati, Ohio 45201-0960
Phone: (513) 287-4320
Fax: (513) 287-4385
E-mail: rocco.d'ascenzo@duke-energy.com

CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing Application of Duke Energy Kentucky, Inc. has been served via overnight mail to the following party on this 31st day of May, 2017.

Rocco O. D'Ascenzo

Rebecca W. Goodman
The Office of the Attorney General
Utility Intervention and Rate Division
700 Capital Ave., Ste 20
Frankfort, Kentucky 40601