COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC. FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF BACKUP FUEL FACILITIES AT ITS BLUEGRASS GENERATING STATION	))))))	CASE NO. 2018-00292

ORDER

On August 24, 2018, East Kentucky Power Cooperative, Inc. (EKPC), filed an application, pursuant to KRS 278.020(1) and 807 KAR 5:001, Sections 14 and 15, requesting authorization for a Certificate of Public Convenience and Necessity (CPCN) to construct an on-site backup fuel supply project at EKPC's Bluegrass Generating Station (Bluegrass Station) located in Oldham County, Kentucky. The capital cost of the proposed project is estimated to be $62.8 million. EKPC estimates that the incremental annual operations and maintenance expense associated with the proposed project will be approximately $587,000. EKPC states that the project is needed to ensure the Bluegrass Station's continued reliable and economic operation in light of the Capacity Construct now in place within PJM Interconnection, LLC (PJM).

Contemporaneous with the application, EKPC filed a motion requesting a deviation from the filing requirements contained in 807 KAR 5:001, Section 15(2)(d)(2). The regulation requires the submittal of plans, specifications, and drawings of the proposed construction project. EKPC states that it has attached as Exhibit A to its application a map of the Bluegrass Station with relevant facilities and infrastructure identified. EKPC

further states that preliminary plans and specifications for the proposed project have been provided as an appendix to a report submitted in conjunction with the Direct Testimony of Sam Yoder (Attachment SY–3). Although additional design work is being undertaken, EKPC asserts that the maps, plans, and specifications set forth in Exhibit A and the appendix of Attachment SY–3 are currently the most detailed drawings available to EKPC. To the extent 807 KAR 5:001, Section 15(2)(d)(2), requires the submission of final, fully-detailed plans and specifications; EKPC seeks a deviation from this requirement but commits to filing any plans and specifications that are created during the pendency of this proceeding that are more detailed or materially different from those submitted with its application.

Pursuant to the Commission's Order of September 10, 2018, a procedural schedule was established for the processing of this matter. The procedural schedule provided, among other things, a deadline for requesting intervention, two rounds of discovery upon EKPC's application, a deadline for filing intervenor testimony, discovery upon intervenor testimony, and an opportunity for EKPC to file rebuttal testimony. There are no intervenors in this proceeding. EKPC responded to two rounds of discovery propounded by Commission Staff.

On January 9, 2019, EKPC filed a motion requesting that the matter be submitted for a decision based on the existing record without the need for a hearing and expressly waived any right that it has to a hearing. The Commission finds that EKPC's motion should be granted and the matter is now submitted for a decision based on the existing record.

BACKGROUND

EKPC is a non-profit, rural electric cooperative corporation established under KRS Chapter 279.[1] EKPC generates, transmits, and sells wholesale electricity to its 16-member distribution cooperative.[2] Those distribution cooperatives, in turn, distribute and sell electricity at retail to approximately 530,000 customers in all or portions of 87 counties.[3]

EKPC's generation portfolio consists of coal-fired baseload units, natural gas peaking units, landfill gas-to-energy facilities, a community solar facility, and purchased power agreements.[4] EKPC owns and operates a total of approximately 2,965 megawatts (MW) of net summer generating capability and 3,267 MW of net winter generating capability.[5] EKPC's natural gas peaking units include the Bluegrass Station and the J.K. Smith Station (Smith Station) in Clark County, Kentucky.[6] The Smith Station consists of nine combustion turbine (CT) gas units with a combined net summer capacity of 753 MW and a combined net winter capacity of 989 MW.[7] The Bluegrass Station consists of three CT units with a combined net summer capacity of 501 MW and a combined net winter capacity of 567 MW.[8]

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[1] Direct Testimony of Don Mosier (Mosier Testimony) at 2.

[2] *Id.* at 2–3.

[3] *Id.* at 3.

[4] *Id.*

[5] *Id.*

[6] *Id.*

[7] *Id. See also*, Direct Testimony of David Crews (Crews Testimony) at 18.

[8] Mosier Testimony at 3.

According to EKPC, the Bluegrass Station began commercial operation in 2002 and is configured to operate using only natural gas, which is provided by an adjacent interstate natural gas pipeline owned and operated by Texas Gas Transmission, LLC (Texas Gas).[9] The Bluegrass Station has historically relied on interruptible service from Texas Gas, which has allowed EKPC to obtain natural gas at a lower cost than firm service and has been adequate given that the Bluegrass Station is comprised of peaking units that operate only intermittently.[10]

As a result of widespread generating unit unavailability during the January 2014 Polar Vortex combined with the increased reliance on natural gas, PJM redesigned its capacity market by implementing the Capacity Performance construct to provide greater incentives for generation owners to pursue and ensure reliability and efficiency.[11] Under Capacity Performance, generation resources in PJM are required to meet their commitments to deliver electricity whenever PJM determines they are needed to meet power system emergencies, during what are known as Performance Assessment Intervals (PAI) or Performance Assessment Hours (PAH).[12] A Capacity Performance resource will be subject to significant penalties if it is unable to perform when called upon by PJM during a PAI or PAH period.[13] Conversely, if a Capacity Performance resource is called upon, and over performs during any PAH, it will be rewarded based on

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[9] *Id.* at 4.

[10] *Id.*

[11] Mosier Testimony at 7–8. *See also* Crews Testimony at 7.

[12] Crews Testimony at 7–8.

[13] *Id.*

performance-based bonuses.[14] The Federal Energy Regulatory Commission approved the Capacity Performance construct in 2015 and all resources within the PJM footprint must meet Capacity Performance requirements for the 2020/2021 Delivery Year.[15]

EKPC stated for the 2020/2021 Delivery Year, the penalty to be assessed against a cleared resource with unavailable generation during a PAH is $3,329 per megawatt hour.[16] EKPC retained Navigant Consulting, Inc., to perform a Bluegrass Capacity Penalty Risk Analysis to determine, among other things, the financial exposure EKPC may face if the Bluegrass Station was unable to perform as expected during PAHs.[17] The primary risks concerning the availability of the Bluegrass Station during PAHs are forced outage or natural gas unavailability. Navigant's analysis shows that EKPC would be subject to approximately $1.4 million in non-performance charges for each PAH that the Bluegrass Station is unable to operate and could reach as high as $79 million for a single year.[18] By way of comparison, EKPC notes that the annual value of the Bluegrass Station in the PJM capacity market was $24 million based on the 2021/2022 capacity performance price of $140/MW-day in the PJM region that encompasses EKPC's service territory.[19]

Although a generation resource may experience a forced outage for a number of reasons, EKPC has identified the interruption of fuel supply as the most significant risk

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[14] *Id.* at 8.

[15] *Id.*

[16] *Id.* at 9.

[17] *Id. See also* Direct Testimony of Ralph Luciani (Luciani Testimony) at 3.

[18] Luciani Testimony, Attachment RL–2 at 4, 12.

[19] *Id.*

faced by the Bluegrass Station that is capable of mitigation but presently not addressed.[20] In light of the potential exposure for significant capacity penalties, EKPC retained Navigant to perform an economic analysis of various reasonable alternative measures to mitigate against gas unavailability at the Bluegrass Station. EKPC notes that its coal-fired units have redundant mechanical systems and maintain an on-site fuel inventory, so they are well positioned in the Capacity Performance market.[21] EKPC further notes that seven of the nine gas units at the Smith Station are capable of operating on dual fuels and are backed up with a large fuel oil tank.[22] Moreover, according to EKPC, there are multiple natural gas pipelines available for supply at the Smith Station site such that all nine units have at least two options for natural gas supply.[23] Accordingly, only the Bluegrass Station was evaluated to determine the options to mitigate potential Capacity Performance risk.

Regarding the Bluegrass Generation options, those alternatives included short-term firm gas transportation, enhanced firm gas transportation, liquefied natural gas (LNG), and fuel oil.[24] EKPC also examined purchasing insurance products to hedge against penalties that may be assessed as a result of fuel supply interruption and accepting the risk of non-performance presented by the Bluegrass Station's single-source, interruptible fuel supply.[25]

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[20] Application at paragraph 19.

[21] Crews Testimony at 18.

[22] *Id.*

[23] *Id.*

[24] Luciani Testimony, Attachment RL–2 at 4–6.

[25] Crews Testimony at 10–11.

EKPC ruled out the insurance products noting that although certain coverage was available the limitations, exclusions, and pricing of such coverage was not favorable when compared to the cost of, and exposure mitigated by an on-site backup fuel resource at the Bluegrass Station.[26] EKPC further points out that uncertainty with respect to the availability and future pricing of any potential insurance product presents risk EKPC seeks to avoid.[27]

As for the status quo scenario, Navigant's examination focused both on the amount of possible Capacity Performance penalties that could be levied against the Bluegrass Station as well as the likelihood that such penalties would be borne over the next 20 years.[28] Navigant conducted a multi-scenario evaluation to reflect both varying amounts of PAIs and varying amounts of primary fuel supply interruptions.[29] Navigant then performed a breakeven analysis to determine how many applicable PAI events would be necessary to offset EKPC's investment in each of the contemplated mitigation strategies.[30] EKPC ultimately concluded that the Capacity Performance risk faced by the Bluegrass Station requires mitigation efforts.[31]

Regarding the firm gas transportation alternatives, EKPC examined this option by obtaining pricing information and examined the available service types and timeframes

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[26] *Id.* at 12.

[27] *Id.* at 12–13.

[28] *Id.* at 16.

[29] *Id.* at 16–17.

[30] *Id.* at 17.

[31] *Id.*

available from Texas Gas.[32] At the Bluegrass Station, EKPC notes that natural gas firm transportation can be procured from Texas Gas pipeline for a full year or on a short-term firm monthly basis at a higher monthly reservation price.[33] Enhanced firm gas service is also available at an extra cost, which allows the maximum gas quantity in each hour to be 1/16th of the contracted amount as compared to a maximum hourly amount of 1/24th under either full year or short-term firm service.[34] EKPC ultimately concluded that changing the firm gas supply was not an economically viable option to mitigate potential Capacity Performance risk given that the Bluegrass Station is comprised of peaking units that operate only intermittently with relatively low-capacity factors.[35]

Navigant's analysis shows that the total levelized annual cost over a 20-year study period for short-term firm gas transportation was $7.0 million for the partial winter months of December through February and $11.7 million for the full winter months of November through March.[36] The Navigant analysis also shows that the total levelized annual cost over a 20-year study period for enhanced firm gas transportation was $5.5 million for the partial winter months of December through February and $9.1 million for the full winter months of November through March.[37]

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[32] *Id.* at 11.

[33] *Id.*

[34] *Id.*

[35] *Id.* at 12.

[36] Luciani Testimony, Attachment RL–2 at 11. Navigant's report states that it examined procuring alternatives for short-term firm transportation and enhanced firm transportation over the two winter month scenarios because natural gas unavailability in the summer was not very likely to occur.

[37] *Id.*

Navigant's Bluegrass Capacity Penalty Risk Analysis assumed a capital cost for LNG capability and storage to be approximately $81.0 million and annual fixed operations and maintenance (O&M), and fuel carrying costs of $0.5 million.[38] The total levelized annual cost over a 20-year study period for the LNG alternative is $6.0 million.[39] Regarding the fuel oil option, Navigant assumed a capital cost of $62.8 million and annual fixed O&M and fuel carry costs of $0.5 million.[40] The total levelized annual cost over a 20-year study for the fuel oil option is $4.8 million.[41]

Navigant also conducted a breakeven PAH analysis for each alternative by calculating the net benefit for the Bluegrass Station being available during a PAH.[42] Navigant then determined the breakeven number of PAHs for each fuel alternative to cover its levelized costs over 20 years.[43] Based on its calculations, Navigant concluded that Bluegrass would only need to become available in an additional 42 winter PAHs over a 20-year period for the fuel oil to become economic.[44] The next lowest breakeven point was the enhanced firm transportation over the partial winter months of December through February, which required an additional 47 winter PAHs over the 20-year period to become economic.[45] Navigant notes, however, that to reach this level of additional PAHs, there

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[38] *Id.*

[39] *Id.*

[40] *Id.*

[41] *Id.*

[42] *Id.* at 12.

[43] *Id.*

[44] *Id.*

[45] *Id.*

would need to be enough future PAHs in PJM in which there was a gas interruption on the pipeline serving the Bluegrass Station during those PAHs.[46] Based on the scenarios analyzed by Navigant, the analysis indicates that the fuel oil alternative may not pay for itself over 20 years in present value terms, but will still provide valuable insurance against high single-year capacity penalties of as much as $79 million.[47]

EKPC also retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell), to prepare a screening level feasibility and cost analysis of each the two on-site backup fuel supply options at the Bluegrass Station.[48] EKPC and Burns & McDonnell evaluated four alternatives for storing LNG at the Bluegrass Station, which alternatives varied based on the type of storage tanks to be utilized (bullet v. field erected) as well as the amount of fuel to be stored (24-hour capacity v. 48-hour capacity).[49] The estimated capital costs for the LNG alternatives ranged from $81 million (cryogenic bullet tanks with 24-hour capacity) to $120 million (cryogenic bullet tanks with 48-hour capacity).[50] EKPC and Burns & McDonnell also evaluated four alternatives for storing fuel oil at the Bluegrass Station.[51] The fuel oil alternatives included the number of storage tanks (one or two) and total storage capacity (24-hour v. 48-hour).[52] The estimated capital costs for the fuel oil alternatives ranged from a low of $62 million (two storage tanks with 24-hour

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[46] *Id.* at 17.

[47] *Id.*

[48] Crews Testimony at 13.

[49] *Id.* at 13–14.

[50] Direct Testimony of Sam Yoder (Yoder Testimony), Attachment SY–2 at 21.

[51] Crews Testimony at 15.

[52] *Id.*

capacity) to a high of $66.5 million (one storage tank with 48-hour capacity).[53] In addition to the indicative capital costs for each LNG or fuel oil alternatives, Burns & McDonnell further examined factors such as backup fuel duration, practicability/feasibility, O&M impacts, industry experience, and estimated performance and emissions impacts.[54]

EKPC notes that LNG provides an on-site backup fuel that can be readily available and utilized at the Bluegrass Station.[55] EKPC further notes that other than fuel storage, few modifications would need to be made to the Bluegrass Station to be able to utilize LNG.[56] However, EKPC maintains that LNG is a relatively new fuel source with little industry experience utilizing this fuel in a utility-scale power plant environment.[57] EKPC avers that the underlying risk of depending on LNG as a fuel source is unknown at this time and that the closest supplier is in Indianapolis, Indiana, approximately 98 miles from the Bluegrass Station.[58] Significantly, EKPC points out that the installed cost of all the LNG options far exceeded the installed cost if fuel oil was implemented as a backup fuel.[59] EKPC indicates that these negative reasons caused it to not consider the LNG alternative.

Regarding the fuel oil option, EKPC states that the Bluegrass Station is designed to accommodate the use of both natural gas and fuel oil by employing interchangeable support housings and other modifications.[60] EKPC avers that it selected the fuel oil

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[53] Yoder Testimony, Attachment SY–2 at 21.

[54] Yoder Testimony at 1–2.

[55] Crews Testimony at 14.

[56] *Id.*

[57] *Id.*

[58] *Id.* See also, Yoder Testimony, Attachment SY–2 at 27.

[59] Luciani Testimony, Attachment RL–2 at 11.

alternative because it had the lowest cost, provided the most flexibility, and had the lowest risk.[61] EKPC notes, based on the Burns & McDonnell screening analysis, that there are 11 ultra-low sulfur diesel fuel oil terminals within a 50-mile radius of the Bluegrass Station, with the closest being 24 miles away.[62]

In addition to the screening analysis, Burns & McDonnell developed a Scoping Report to define the proposed fuel oil project's preliminary design, schedule, and cost estimates.[63] Specifically, EKPC proposes to implement the fuel oil project utilizing two storage tanks providing 24-hours' worth of fuel storage capacity.[64] The storage tanks would be made of carbon steel with a total capacity of 1,160,000 gallons of usable fuel, which will allow each Bluegrass Station unit to operate continuously at its maximum winter unit rating for a 24-hour period.[65] EKPC expects this level of storage to provide adequate protection against the anticipated duration of a PJM-declared PAH.[66]

There will be three major components to the fuel oil project. The first involves modifications to the combustion turbines and associated equipment, including installation of dual fuel nozzles, new fuel oil pump skids, water injection pump skids, drain and purge system, and control systems for the CTs to operate on fuel oil or natural gas.[67] The

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[60] Crews Testimony at 14.

[61] *Id.* at 16.

[62] Yoder Testimony, Attachment SY – 2 at 27.

[63] Yoder Testimony at 4.

[64] Direct Testimony of Craig A. Johnson (Johnson Testimony) at 8.

[65] *Id.* at 8–9.

[66] *Id.* at 9.

[67] *Id.*

second component involves the installation of the two 580,000-gallon storage tanks.[68] The third component is the balance of plant installations involving new piping, controls, instrumentation, electrical and mechanical equipment, and a demineralized water storage tank to control nitrogen oxides emissions.[69]

Based on the analyses developed by Navigant and Burns & McDonnell as well as its own internal review of the various alternatives, EKPC states that it ultimately selected the fuel oil option. EKPC notes that implementing fuel oil as a backup fuel supply is the least cost alternative available to EKPC to mitigate the risk of unavailable natural gas supply at the Bluegrass Station. EKPC further states that the fuel oil project represents the best solution for promoting the continued reliability and economic viability of the Bluegrass Station for the foreseeable future.

EKPC informs that it will finance the proposed project through its existing credit facility before transitioning to a long-term debt placement available through its Trust Indenture. EKPC further informs that it will use a multiple contract approach with adjustment unit pricing to develop and construct the project. EKPC will work with Burns & McDonnell to create and procure the necessary construction and major equipment contracts and states that the use of multiple contracts will allow it to minimize procurement costs by providing for competitive bidding to reduce contractor markups. EKPC envisions, based on current projections, implementing the project by year-end in 2020.

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[68] *Id.*

[69] *Id.*

DISCUSSION

The Commission's standard of review of a request for a CPCN is well settled. No utility may construct or acquire any facility to be used in providing utility service to the public until it has obtained a CPCN from this Commission.[70] To obtain a CPCN, the utility must demonstrate a need for such facilities and an absence of wasteful duplication.[71]

"Need" requires:

> [A] showing of substantial inadequacy of existing service, involving a consumer market sufficiently large to make it economically feasible for the new system or facility to be constructed or operated.
>
> [T]he inadequacy must be due either to a substantial deficiency of service facilities, beyond what could be supplied by normal improvements in the ordinary course of business; or to indifference, poor management or disregard of the rights of consumers, persisting over such a period of time as to establish an inability or unwillingness to render adequate service.[72]

"Wasteful duplication" is defined as "an excess of capacity over need" and "an excessive investment in relation to productivity or efficiency, and an unnecessary multiplicity of physical properties."[73] To demonstrate that a proposed facility does not result in wasteful duplication, we have held that the applicant must establish that a thorough review of all reasonable alternatives has been performed.[74] Selection of a

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[70] KRS 278.020(1). Although the statute exempts certain types of projects from the requirement to obtain a CPCN, the exemptions are not applicable to this case.

[71] *Kentucky Utilities Co. v. Pub. Serv. Comm'n*, 252 S.W.2d 885 (Ky. 1952).

[72] *Id.* at 890.

[73] *Id.*

[74] Case No. 2005-00142, *Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity for the Construction of Transmission Facilities in Jefferson, Bullitt, Meade, and Hardin Counties, Kentucky* (Ky. PSC Sept. 8, 2005).

proposal that ultimately costs more than an alternative does not necessarily result in wasteful duplication.[75] All relevant factors must be balanced.[76]

Having reviewed the record and being otherwise sufficiently advised, the Commission finds that EKPC has established that there is a need to comply with the Capacity Performance requirements implemented by PJM to ensure that capacity resources that are offered and accepted into the PJM capacity market are available when called upon to perform. The Capacity Performance requirements are applied to generation owners in both the Fixed Resource Requirement construct and the Reliability Performance Model construct, which includes EKPC. Failure to perform when called upon would expose EKPC and its ultimate ratepayers to strict and significant financial penalties and assessments. Because the Bluegrass Station is served by only one gas pipeline and it currently receives gas on an interruptible basis combined with the absence of on-site fuel storage, the Commission finds that it is reasonable for EKPC to address measures to mitigate this risk exposure.

The Commission further finds that there is sufficient evidence in the record to support the conclusion that the proposed fuel oil project is the most reasonable least-cost alternative for complying with PJM's Capacity Performance requirements. The record shows that EKPC evaluated multiple reasonable alternatives across several scenarios, factoring in relative cost, operational risk, mitigating risks of non-performance, feasibility, and fuel supply risk. The Commission finds that EKPC's evaluation, both internal and

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[75] *Kentucky Utilities Co. v. Pub. Serv. Comm'n*, 390 S.W.2d 168, 175 (Ky. 1965). *See also* Case No. 2005-00089, *Application of East Kentucky Power Cooperative, Inc. for a Certificate of Public Convenience and Necessity for the Construction of a 138 kV Electric Transmission Line in Rowan County, Kentucky* (Ky. PSC Aug. 19, 2005), final Order.

[76] Case No. 2005-00089, *East Kentucky Power Cooperative, Inc.* (Ky. PSC Aug. 19, 2005), final Order.

external, revealed that the proposed fuel oil project is favorable in terms of overall project costs and ability to meet the requirements of PJM's Capacity Performance with relatively minimal impacts to current operational processes and lower risk with respect to fuel availability during the winter season. The Commission finds EKPC's selection to be reasonable.

Lastly, the Commission finds that EKPC has established good cause to permit it to deviate from the requirements of 80 KAR 5:001, Section 15(2)(d)(2). However, the Commission will require EKPC to file the "as built" drawings or plans of the fuel oil project subsequent to the completion of the project's construction.

IT IS THEREFORE ORDERED that:

1. EKPC's request for a CPCN to construct a fuel oil system at its Bluegrass Station is granted.

2. EKPC's request for a deviation from 807 KAR 5:001, Section 15(2)(d)(2) is granted.

3. EKPC shall file "as-built" drawings or plans within 60 days of completion of the construction authorized by this Order.

4. Any documents filed in the future pursuant to ordering paragraph 3 shall reference this case number and shall be retained in the post-case correspondence file.

5. This case is hereby closed and will be removed from the Commission's docket.

By the Commission

ENTERED

FEB 28 2019

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