COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF NORTHERN KENTUCKY WATER DISTRICT FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO REPLACE ITS EXISTING AUTMOATED METER READING ("AMR") METERS WITH ADVANCED METERING INFRASTRUCTURE ("AMI") AND ISSUANCE OF A BOND ANTICIPATION NOTE	)))))))	CASE NO. 2021-00095

O R D E R

On February 26, 2021, Northern Kentucky Water District (Northern Kentucky District) filed an electronic application, pursuant to 807 KAR 5:001, Section 15, and KRS 278.020, for a Certificate of Public Convenience and Necessity (CPCN) granting Northern Kentucky District authority to replace its existing Automated Meter Reading (AMR) system with an Advanced Metering Infrastructure (AMI) system (AMI/AMR Hybrid System). The Attorney General of the Commonwealth of Kentucky, by and through the Office of Rate Intervention (Attorney General) was granted intervention in this matter by the Commission's March 22, 2021 Order. To ensure the orderly review of the application, the Commission established a procedural schedule by Order dated April 12, 2021. Northern Kentucky District responded to two rounds of discovery from the Attorney General. This matter now stands ready for a decision based on the written record.

BACKGROUND

Northern Kentucky District, a water district organized under KRS Chapter 74, provides retail water service to approximately 84,139 customers in Kenton, Boone, and

Campbell counties, Kentucky.[1] Northern Kentucky District sells water wholesale to the following nonaffiliated water distribution systems Bullock Pen Water District, Pendleton County Water District, and to the city of Walton.[2]

PROPOSED PROJECT

Northern Kentucky District's proposed AMI/AMR Hybrid System project includes: (1) the installation of 83,500[3] Meter Interface Units (AMI Transmitters) to measure and to transmit water usage; (2) the installation of a Sensus reading system consisting of twelve AMI base stations to be installed on water storage tank sites and used to receive AMI transmitter data and to convey the meter data to a cloud-based system; (3) a cloud-based service to collect, store, manage, and analyze the AMI data; (4) training for Northern Kentucky District's staff on all of the AMI System components; and (5) 20 years of maintenance support for each component of the AMI/AMR Hybrid System.[4] The AMI base stations will have battery back-up provisions for at least eight hours and up to 40 hours of backup power.[5] The AMR portion of the hybrid system will serve approximately 2,000 customer meters that are located in the more rural areas of Northern Kentucky District's system and will be read using a mobile drive-by system, but if additional AMI infrastructure is built at a later date, the same AMR transmitters can be used.[6] The

[1] *Annual Report of Northern Kentucky Water District to the Kentucky Public Service Commission for the Year Ended December 31, 2019* at 15 and 53.

[2] *Id.* at 60.

[3] 85,500 (Existing Meters, Application at paragraph 6.a.) – 2,000 (Proposed AMR Meters) = 83,500 (AMI Meters).

[4] Application at paragraph 6.d.

[5] *Id.*

[6] *Id.,* Exhibit A.1, Meter Reading System Replacement, Project Description at 5.

improved AMI/AMR Hybrid System is compatible with the District's existing water meters and will be supported by the vendor for at least 20 years.[7]

The total cost of Northern Kentucky District's proposed AMI/AMR Hybrid System project, including but not limited to design engineering, construction engineering, contractors bid, and contingencies, is approximately $13,500,000.[8] Northern Kentucky District will fund the AMI/AMR Hybrid System project with $2,500,000 of internally generated funds and $11,000,000 from a Bond Anticipation Note (BAN).[9] Since the AMI/AMR Hybrid System project will be financed through a BAN, Commission approval of the financing is not required at this time. However, pursuant to KRS 278.300, Northern Kentucky District must obtain Commission approval before issuing any long-term financing.

LEGAL STANDARD

The Commission's standard of review of a CPCN request 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 except as provided in KRS 278.020(1). To obtain a CPCN a utility must demonstrate a need for such facilities and an absence of wasteful duplication.[10]

"Need" requires

[7] *Id.,* at 6.

[8] *Id*. Exhibit D, Project Meter Reading System Replacement, Project Finance Information. $116,150 (Design Engineering) + $102,550 (Construction Engineering) + $12,881,300 (Contractor's Bid) + $400,000 (Contingencies) = $13,500,000.

[9] Application at paragraph 5.

[10] *Kentucky Utilities Co. v. Public Service Comm'n*, 252 S.W.2d 885 (Ky. 1952).

> [A] showing of a 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.[11]

"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."[12] To demonstrate that a proposed facility does not result in wasteful duplication, we have held that the applicant must demonstrate that a thorough review of all reasonable alternatives has been performed.[13] Selection of a proposal that ultimately costs more than an alternative does not necessarily result in wasteful duplication.[14] All relevant factors must be balanced.[15]

[11] *Id*. at 890.

[12] *Id*.

[13] 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).

[14] *See Kentucky Utilities Co. v. Public Service 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.

[15] Case No. 2005-00089, *East Kentucky Power Cooperative, Inc*. (Ky. PSC Aug. 19, 2005), final Order at 6.

DISCUSSION

In 2008 and 2009, Northern Kentucky District purchased and installed the Orion Mobile Automated Meter Reading System (Orion AMR System) that was manufactured by Badger Meter Inc. (Badger).[16] As part of the Orion AMR System, a data line was installed on each of the 85,500 meters that connected to an external transmitter allowing for the collection of meter readings while driving by in the vicinity of the meter's physical location.[17] In 2018, Badger informed Northern Kentucky District that it would no longer manufacture and sell the transmitters being used by the existing Orion AMR System.[18] Since 2018, over 500 of Northern Kentucky District's transmitters have failed and they continue to fail at an increasing rate due to their age.[19]

Badger and the other meter manufacturers confirmed that there are no other transmitter brands that would be compatible with Northern Kentucky District's current Orion AMR System and that even if a different Badger transmitter were to be installed, Northern Kentucky District would still be required to purchase an entirely new reading system.[20] In the interim until a replacement system could be deployed, Northern Kentucky District converted some of the accounts with failed transmitters to Badger's cellular meter reading system and used a small number of mobile-read transmitters from

[16] Application at paragraph 6.a. and Exhibit A, Project Meter Reading System Replacement, Project Description, at Map, Engineering Reports and Specifications (Exhibit A) at 1-2.

[17] *Id.*

[18] *Id.*

[19] *Id.*

[20] Northern Kentucky District's Responses to the Attorney General's First Request for Information (Attorney General's First Request) (filed May 11, 2021), Item 5.

market competitors such as Sensus, Mueller, and Neptune.[21] This confirmed that each vendor's meter reading equipment would perform satisfactorily with Northern Kentucky District's existing meters and billing/customer service software.[22]

The absence of an equitable replacement transmitter, effectively ended the useful life of Northern Kentucky District's Orion AMR System.[23] In order for Northern Kentucky District to meet the future needs of its customers there needs to be a significant modification to the existing Orion AMR System or the implementation of a completely new meter reading system.[24] Northern Kentucky District's goal was to obtain a replacement meter reading system that is sustainable over a long term, reduces water loss, increases reading efficiency, improves water resource management and enhances customer services. [25]

Generally, there are two types of meter reading technologies currently available to Northern Kentucky District, AMR systems – usage data is collected by meter readers that either walk or drive by the meter; and AMI systems – water usage data is collected through a fixed network stationed throughout the area.[26] AMI systems are broken down into the following three categories: standard power, high power, and cellular.[27]

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[21] Application, Exhibit A, Project Meter Reading System Replacement, Project Description, at Map, Engineering Reports and Specifications (Exhibit A) at 8.

[22] *Id.*

[23] Northern Kentucky District's Responses to the Attorney General's First Request (filed May 11, 2021), Item 2.

[24] Application at paragraph 6.a.

[25] Application, Exhibit A at 2.

[26] *Id.*

[27] *Id.*

HDR Engineering, Inc. (HDR) is a nationally recognized engineering firm that assists water utilities in evaluating, selecting, and implementing AMI technology.[28] To determine the best course of action, Northern Kentucky District hired HDR to prepare a cost-benefit analysis to evaluate the currently available meter reading technologies.[29] HDR's cost-benefit analysis evaluated the upfront capital cost of each system and the 20-year operational cost of nine separate scenarios, which consisted of the different types of AMR, AMI, and hybrid systems available plus optional features such as remote shutoff valves (RSV) and a customer portal.[30] Below are the key findings of HDR's cost-benefit analysis.

1. AMR has the lowest capital installation followed by AMI cellular;

2. When factoring in the total cost of ownership on a 20-year present value basis, AMI standard power and high-power systems are less expensive than both AMR and AMI cellular; and

3. The study also indicated that installing Remote Shut-off Valves at accounts having frequent manual shutoffs will save significant money (estimated at approximately $1.0 million over 20 years).[31]

The bidding documents prepared by HDR and Northern Kentucky District invited responses from vendors for AMR, AMI, and a hybrid system of both AMR and AMI.[32] The

[28] Application, Exhibit A, Project Meter Reading System Replacement, Project Description, at Map, Engineering Reports and Specifications (Exhibit A) at 1.

[29] *Id.* at 2.

[30] *Id.* at 2–3.

[31] *Id.* at 3.

[32] *Id.*

bidding documents allowed the following options to be included: Remote Shutoff Valves (RSV); customer portals; system maintenance; and meter support (meter data management system, replacement of meters, and replacement of pressure regulating valves).[33] Northern Kentucky District received bids from the following seven vendors: Aclara, Badger Meter, CITCO Water (Sensus), IBT AMI Solutions (Master Meter), Neptune, United Systems (Itron), and Zenner USA.[34] The table below is a comparison of HDR's cost-benefit analysis of the nine alternatives considered to the actual range of bids Northern Kentucky District received.[35]

Summary of Meter Reading Systems and Bid Costs

	HDR's Estimate				
Scenario	Capital Cost	20-Year Present Value Cost	Base Bid Range of Costs	20 Year Present Value Bid Range
AMR	$ 11.7 Million	$ 21.8 Million	$ 11.0 Million - $ 14.6 Million	$ 21.4 Million - $ 25.0 Million
AMI Cellular	$ 12.9 Million	$ 23.0 Million	$ 13.5 Million - $ 28.2 Million	$ 19.1 Million - $ 35.0 Million
AMI Standard Power/Cellular Hybrid	$ 14.9 Million	$ 19.7 Million	$ 20.9 Million - $ 22.1 Million	$ 25.5 Million - $ 26.8 Million
AMI/AMR Hybrid (Standard and High Power)	$ 15.1 Million	$ 19.9 Million	$ 13.1 Million - $ 18.2 Million	$ 18.8 Million - $ 22.8 Million
AMI Standard Power/Cellular Hybrid	$ 15.4 Million	$ 18.6 Million	$ 15.5 Million - $ 20.4 Million	$ 19.7 Million - $ 25.0 Million
AMI High Power/Other Network Hybrid	$ 15.4 Million	$ 19.0 Million	No Bids	No Bids
AMI High Power	$ 15.5 Million	$ 18.7 Million	$ 13.6 Million - $ 16.4 Million	$ 18.2 Million - $ 20.9 Million
AMI High Power with Customer Portal	$ 15.6 Million	$ 18.9 Million	$ 13.8 Million - $ 16.6 Million	$ 17.8 Million - $ 20.6 Million
AMI High Power with Remote Shutoff	$ 15.9 Million	$ 18.0 Million	$ 14.0 Million - $ 16.9 Million	$ 17.6 Million - $ 20.4 Million

The table above indicates that a AMI/AMR Hybrid System solution with AMI Standard Power or High Power, combined with an AMR system in areas that are challenging for the fixed network to serve, offers the lowest present value cost and a lower up-front capital cost than a standard AMI only system. Also the bids received by Northern Kentucky District support the results of HDR's cost-benefit analysis.[36] After consulting with HDR, the bid from CITCO Water for a hybrid AMI/AMR using a Sensus reading system was

[33] *Id.*

[34] *Id.*

[35] *Id.*

[36] *Id.* at 4.

selected by Northern Kentucky District's team as the preferred solution and that would be evaluated in further detail.[37] The hybrid system stood out as a preferred solution as it provided significant initial capital costs savings.[38]

Upon review of the water disconnections (i.e. shutoffs) conducted annually, Northern Kentucky District determined that approximately 1,000 accounts required three or more shutoffs per year (pre-COVID).[39] Northern Kentucky District believes that three shutoffs per year per account is the level at which installing an RSV valve is more cost effective than dispatching a service representative each time the valve needs to be opened or closed. The initial capital cost of installing 1,000 RSV's of $425,000 but would be offset by the projected 20-year operating cost reduction of $1,029,150.[40]

Northern Kentucky District awarded the bid to Sensus, for a total 20-year bid amount of $16,648,219 broken down as follows:

Capital Cost – AMI/AMR Hybrid System	$ 12,456,300
Operation & Maintenance Cost – Data Management Support Years 1-5	662,024
Sub-Total: Base Bid	13,118,324
Capital Cost – Remote Shutoff Valves	425,000
Operation & Maintenance Cost – Data Management Support Years 6-20	2,399,730
Operation & Maintenance Cost – AMI System Maintenance	705,165
Total 20-Year Bid Cost	$16,648,219[41]

[37] *Id.* at 5.

[38] *Id.*

[39] *Id.* at 6–7.

[40] *Id.*

[41] *Id.* at 7.

Northern Kentucky District noted that the benefits of an AMI system are the ability to proactively identify customer-side leaks with more frequent meter readings, a reduction in staff time spent reading meters, remote shutoff valves that allow for disconnecting and reconnecting water service, and potential add-on system enhancements (customer portals to allow self-monitoring of water usage and for communication, leak detection sensors to simplify finding system water loss, and pressure sensors to monitor system operations).[42]

The specific benefits provided by the Sensus transmitters are that they not only report customer water usage, but they also report meter tampering, continuous flow, high or low consumption, and low battery alarms.[43] According to Northern Kentucky District the projected Sensus transmitter failure rate is 0.05 percent through the initial 15-year period and 0.20 percent for the next five years.[44] Another benefit of the Sensus transmitters is that they can either transmit data through the AMI network or read using a mobile collector or handheld device like the AMR portion of the system.[45]

For accounting purposes, Northern Kentucky District will retire its Orion AMR System when the new AMI/AMR Hybrid System is placed in-service.[46] With an estimated in service date of June 30, 2023, Northern Kentucky District estimates that its Orion AMR

[42] *Id.*

[43] *Id.* at 6.

[44] *Id.*

[45] *Id*.

[46] Attorney General's First Request, Item 2.

System will have a remaining useful life of two years and a net book value of $995,450.[47] Northern Kentucky District will continue depreciating the Orion AMR System until it is actually removed from service and any remaining net book value will be addressed in Northern Kentucky District's next base rate case.[48]

According to Northern Kentucky District the Sensus transmitters in the proposed AMI meter reading system are powered with lithium thionyl chloride batteries that are designed to last over 20 years.[49] The Sensus batteries have a 20-year warranty, a 15-year full-warranty plus a 5-year prorated warranty.[50] Although the expected life span of the AMI/AMR Hybrid System is 20 years, Northern Kentucky District will depreciate its AMI/AMR Hybrid System over the 15-year full-warranty period of the batteries.[51]

FINDINGS

Having reviewed the application, supporting materials, and being otherwise sufficiently advised, the Commission finds that:

1. The proposed project will not result in wasteful duplication of existing facilities. Northern Kentucky District, with professional engineering consultants, HDR, submitted the analysis and support to verify that it conducted a thorough review of reasonable alternatives to solve the problem of its metering equipment becoming obsolete and show that the proposed hybrid AMI/AMR using a Sensus reading system

[47] Application, Exhibit A.

[48] *Id*.

[49] *Id.,* Item 16.

[50] *Id.*

[51] *Id.*

does not propose to duplicate existing infrastructure. As opposed to duplicating, the record shows that Northern Kentucky District sought a solution to a service it will require when its equipment becomes obsolete. The record shows that Northern Kentucky District sought a cost-effective option to record essential water usage and also reports meter tampering, continuous flow, high or low consumption, low battery alarms, and can perform with the equipment that will remain in service.[52]

2. The proposed project does not conflict with any existing certificates or the service of any other utility operating in the area which is verified by Northern Kentucky District and HDR in its application, Exhibit A.

3. Public convenience and necessity require the proposed project because without the proposed project, the current Orion AMR System will become obsolete and leave Northern Kentucky District and its customers without sufficient metering equipment. Northern Kentucky District has submitted verified analysis from qualified professional technical consultants to support the prudence of the proposed project being the most reasonable solution to the current equipment becoming obsolete. The analysis submitted also shows that the utility's finances were reasonably considered in the analysis to show the proposed project will allow Northern Kentucky District to continue to provide adequate, reliable, and safe service to its customers.

4. Northern Kentucky District should be prepared to provide an analysis or study to support its proposed 15-year depreciation life for its AMI/AMR Hybrid System.

IT IS THEREFORE ORDERED that:

[52] *Id.* at 6.

1. Northern Kentucky District is granted a CPCN to proceed with the implementation of the AMI/AMR Hybrid System project as set forth in its application.

2. Northern Kentucky District shall notify the Commission prior to performing any additional construction not expressly authorized by this Order.

3. Any deviation from the approved project shall be undertaken only with prior approval of the Commission.

4. Northern Kentucky District shall be prepared to provide an analysis or study to support its proposed 15-year depreciation life for its AMI/AMR Hybrid System to provide the Commission when it files its next base rate case.

5. Northern Kentucky District shall file with the Commission documentation of the total costs of this project, including the cost of construction and all other capitalized costs (e.g., engineering, legal, and administrative), within 60 days of the date that the project is substantially completed. Construction costs shall be classified into appropriate plant accounts in accordance with the Uniform System of Accounts for water utilities prescribed by the Commission.

6. Any documents filed in the future pursuant to ordering paragraphs 2 and 5 of this Order shall reference this case number and shall be retained in the utility's post-case correspondence file.

7. The Executive Director is delegated authority to grant reasonable extensions of time for filing of any documents required by this Order upon Northern Kentucky District's showing of good cause for such extension.

8. This case is closed and removed from the Commission's docket.

By the Commission

ENTERED
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KENTUCKY PUBLIC
SERVICE COMMISSION

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