

Exhibit No.: \_\_\_\_\_  
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Witness: Chad C. Hook  
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Sponsoring Party: The Empire District  
Electric Company  
Case No.: ER-2021-0312  
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**Before the Public Service Commission  
of the State of Missouri**

**Direct Testimony**

**of**

**Chad C. Hook**

**on behalf of**

**The Empire District Electric Company**

**May 2021**



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THE EMPIRE DISTRICT ELECTRIC COMPANY  
BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION  
CASE NO. ER-2021-0312

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DIRECT TESTIMONY OF CHAD C. HOOK  
THE EMPIRE DISTRICT ELECTRIC COMPANY  
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1    **I.    INTRODUCTION**

2    **Q.    Please state your name and business address.**

3    A.    My name is Chad C. Hook, and my business address is 602 Joplin Avenue, Joplin,  
4        Missouri, 64802.

5    **Q.    By whom are you employed and in what capacity?**

6    A.    I am employed by Liberty Utilities Service Corp. as the Regional Director Operations  
7        Strategy for the Central Region, which includes The Empire District Electric Company  
8        (“Empire” or the “Company”).

9    **Q.    On whose behalf are you testifying in this proceeding?**

10   A.    I am testifying on behalf of Empire.

11   **Q.    Please describe your educational and professional background.**

12        I began my career with Empire more than twenty-four years ago, and I have held various  
13        positions of increasing responsibility within electric operations including generation,  
14        transmission, distribution, and metering. My previous company positions include: Night  
15        Janitor, Mail Clerk, Laborer, Assistant Plant Operator, Mechanical Maintenance Welder  
16        1st Class, Journeyman Lineman, Line Foreman, Journeyman Meter Tester, and Assistant  
17        Operations Manager Transmission/Distribution. I spent two years as the Regional  
18        Manager for Environmental Health and Safety, leading the Central Region’s efforts to  
19        successfully improve safety training, and performance. I assumed my current role in July  
20        of 2019, and am responsible for serving as the Company’s national business lead for AMI.

1 **Q. Have you previously testified before the Missouri Public Service Commission**  
2 **(“Commission”) or any other regulatory agency?**

3 A. No, I have not.

4 **Q. What is the purpose of your Direct Testimony in this proceeding?**

5 A. In my testimony, I address two projects contained in Empire’s first plant-in-service  
6 accounting (“PISA”) five-year capital investment plan (the “Clean Transition Plan”) filed in  
7 Case No. EO-2019-0046 on February 26, 2021. First, I provide an overview of the  
8 Company’s Advanced Metering Infrastructure (“AMI”) project and describe Empire’s  
9 implementation of AMI in Missouri. I discuss the importance of AMI and the customer  
10 facing benefits, including those that provide customers with greater convenience and  
11 transparency over their energy usage. Additionally, I discuss the option available for  
12 customers who do not want a smart meter, and highlight the costs included in this case. I  
13 also introduce Empire’s substation security program known as “Project Guardian.”

14 **Q. Are you sponsoring schedules which are attached to your Direct Testimony?**

15 A. Yes. I am sponsoring the following schedules.

| <b>SCHEDULE</b> | <b>TOPIC</b>                     |
|-----------------|----------------------------------|
| <b>CCH-1</b>    | AMI System Components            |
| <b>CCH-2</b>    | AMI Implementation Plan          |
| <b>CCH-3</b>    | Customer Communication Materials |
| <b>CCH-4</b>    | AMI Project Costs                |

16

1 **II. OVERVIEW OF AMI**

2 **Q. What is AMI?**

3 A. As discussed in the Missouri State Energy Plan, “Advanced Metering Infrastructure, is an  
4 integrated system of meters, communications networks, and data management systems that  
5 enables two-way communication between utilities and customers.”<sup>1</sup> AMI is a  
6 comprehensive metering solution working in concert to create two-way communications  
7 between customer meters and the utility. AMI meters, often referred to as “smart meters,”  
8 are digital meters with advanced features and capabilities beyond traditional electricity  
9 meters. In addition to two-way communication, smart meters include more granular usage  
10 measurement, tamper detection, net metering capability, and an internal remotely operable  
11 connect/disconnect switch. The meters transmit information to field collectors, forming a  
12 mesh network, which is flexible in that the meters route data via nearby devices creating a  
13 mesh of network coverage. Within the network each meter serves as a repeater to help  
14 transfer the data to the collectors, which then transmit the information to the AMI control  
15 center through a cellular network.

16 **Q. Is AMI a new technology?**

17 A. No. In 2010, the U.S. Department of Energy’s Office of Electricity, with utilities sharing  
18 the cost, funded the installation of more than 15 million smart meters to modernize  
19 infrastructure and demonstrate the value and benefits of AMI technology.<sup>2</sup> By the end of  
20 2018, more than 88 million smart meters had been deployed throughout the U.S., covering

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<sup>1</sup> Department of Economic Development, Division of Energy, Missouri Comprehensive State Energy Plan  
<https://energy.mo.gov/sites/energy/files/MCSEP.pdf>

<sup>2</sup> Advanced Grid Research, Office of Electricity U.S. Department of Energy, AMI in Review: Informing the Conversation  
[https://www.smartgrid.gov/documents/voe\\_series/voe-ami-in-review-informing-the-conversation](https://www.smartgrid.gov/documents/voe_series/voe-ami-in-review-informing-the-conversation)

1 nearly 70 percent of U.S. households.<sup>3</sup> In 2017, a Staff Report was issued by the Public  
2 Service Commission of the State of Missouri stating that the Division of Energy (“DE”)  
3 “supports investments in advanced metering infrastructure (“AMI”) that provide benefits  
4 to consumers through opportunities such as demand-response programs and enhanced  
5 time-differentiated rate designs. DE also supports AMI deployment by natural gas and  
6 water utilities.”<sup>4</sup> AMI deployments have been completed or are underway across Missouri  
7 by Union Electric (Ameren) and Kansas City Power & Light Co, as well as municipal  
8 utilities like City Utilities of Springfield and the City of Fulton.<sup>2</sup> <sup>above</sup> **Schedule CCH-1**  
9 describes the system components of Empire’s AMI system.

10 **Q. Why is Empire adopting AMI?**

11 A. AMI is a customer-focused foundational technology that directly provides and enables  
12 greater convenience and transparency over a customer’s energy consumption. The AMI  
13 investment supports Empire’s long-term efforts to upgrade its company technologies and  
14 capabilities in order to improve the efficiency, quality, and range of services it provides to  
15 its customers.

16 **Q. Why is the AMI project important to Empire’s customers?**

17 A. The AMI Project will improve the efficiency, quality, and range of services provided to  
18 customers by providing better data about energy usage so customers can be more informed  
19 and make choices about how they consume their energy. Additionally, AMI provides  
20 features that improve Empire’s ability to plan and operate the grid safely and reliably. For

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<sup>3</sup> The Edison Foundation, Institute for Electric Innovation, Electric Company Smart Meter Deployments: Foundation for a Smart Grid (2019 Update) [https://www.edisonfoundation.net/-/media/Files/IEI/publications/IEI\\_Smart-Meter-Report\\_2019\\_FINAL.ashx](https://www.edisonfoundation.net/-/media/Files/IEI/publications/IEI_Smart-Meter-Report_2019_FINAL.ashx)

<sup>4</sup> Missouri Public Service Commission Staff Report “A Working Case to Explore Emerging Issues in Utility Regulation” dated July 7, 2017 in File No. EW-2017-0245 <https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=936094616>

1 example, with AMI, Empire is able to interrogate meters to determine if they are energized,  
2 sometimes avoiding field visits to a customer's premise.

3 **Q. What will Empire customers experience once AMI is fully implemented?**

4 A. It is important to appreciate the wide range of AMI improvements and the nature of the  
5 AMI change process as described above. By implementing AMI, Empire will be able to  
6 significantly upgrade and improve the way it supports its customers in its metering, billing  
7 and customer care functions. Customer service representatives will have access to more  
8 granular customer energy use information than what is possible now, enabling them to  
9 better process customer metering and billing inquiries. Customers establishing or  
10 disconnecting service will find their orders processed more quickly and easily, as AMI  
11 enables this work to be completed remotely. In the long-term, customers will have  
12 additional options to select a due date and will be able to handle many of their service needs  
13 directly through web portals and mobile applications.

14 **III. EMPIRE'S AMI IMPLEMENTATION SCOPE**

15 **Q. Please describe Empire's legacy metering solution.**

16 A. Empire's legacy metering solution requires metering technicians to physically visit and  
17 read each meter in the service territory on a monthly basis. The single monthly meter  
18 readings provide limited energy usage information and do not provide customers or the  
19 company with capabilities for enhanced customer services and programs. Many of the  
20 meters in Empire's service territory have exceeded their useful life, are no longer being  
21 manufactured, and are unsupported by the manufacturing company. While Empire has  
22 replaced some of these meters with digital, solid-state meters, these meters do not have

1 communication capabilities. Continued investment in this legacy metering solution is  
2 neither practical, prudent, nor sustainable.

3 **Q. Please describe the implementation of AMI across the Empire system.**

4 A. Beginning in 2019, Empire initiated planning and design for the AMI system, and the AMI  
5 project was officially kicked off in September 2019. The Company began installing the  
6 AMI system by sectors throughout its central region of Missouri, Arkansas, Oklahoma, and  
7 Kansas in June 2020 and, by December 2020, Empire had completed the installation of the  
8 field collection and communication network. As of March 1, 2021, Empire installed  
9 143,926 smart meters in Missouri. The plan is to be materially complete with the smart  
10 meter installations by June 30, 2021 for the meters in scope. Once implementation is  
11 materially complete, Empire will address any meters not already upgraded, including those  
12 that might be hard to access or that may require additional customer contact and installation  
13 scheduling. **Schedule CCH-2** depicts Empire's AMI implementation plan.

14 **Q. Please describe the physical scope of Empire's AMI system.**

15 A. As further described in **Schedule CCH-2**, Empire is installing the AMI system for  
16 residential and small and medium-sized commercial customers throughout its service  
17 areas, in Missouri, Arkansas, Oklahoma, and Kansas. The AMI system will act as one  
18 network across the four states. Empire's largest customers are not part of the deployment  
19 because these customers already have an advanced metering solution at their facilities.  
20 There are about 147,000 electric meters that will be covered by the network within  
21 Missouri, with the remaining 22,000 meters spread across the other three states. Empire  
22 anticipates installing 123 network collectors, of which, 110 are within Missouri.



1           Additionally, approximately 5,691 water meters are within the coverage of the  
2 planned field communications network and do not require any significant degree of  
3 additional network infrastructure to support. Empire has appropriately allocated costs  
4 associated with the installation and implementation of the water meters to the water  
5 utilities.

6 **Q. Did Empire consider alternatives to implementing AMI?**

7 A. Yes. Empire considered maintaining the status quo; continuing in the installation of non-  
8 communicating solid state meters; and, installing a vehicle-based one-way communicating  
9 remote reading system known as AMR. However, running a modern utility demands levels  
10 of equipment automation, monitoring, diagnostics and control that Empire does not have  
11 today and cannot achieve without a holistic and comprehensive view to its technology  
12 roadmap needs. Without AMI, Empire will not be able to improve core billing processes,  
13 nor will it be able to offer customers new service features and programs. The lack of AMI  
14 data will also hamper Empire's ability to create modern asset management capabilities  
15 across the distribution grid. None of these operational capabilities, which are essential to  
16 operating a modern utility, are possible through these alternatives.

17 **Q. Why not just upgrade to digital non-communicating meters?**

18 A. As discussed earlier, Empire has been replacing some of its old, electro-mechanical meters  
19 with digital, solid-state meters that do not have communication capabilities. These meters,  
20 while functionally adequate for providing monthly usage consumption, cannot be upgraded  
21 to provide the operational and customer benefits of a smart meter. With more than 70% of  
22 US households currently served by AMI, it would not be reasonable nor prudent for Empire

1 to replace its aging infrastructure with technology that does not align with current industry  
2 and peer utility practices.

3 **Q. Did Empire reach out to customers to gain insights and feedback about the rollout of**  
4 **AMI?**

5 A. Yes. Empire recognizes that community engagement is very important and valuable to the  
6 overall success of our efforts. These efforts can help make our customers aware of the AMI  
7 deployment and the meter exchange process. Outreach opportunities are also used to gain  
8 input on customer questions and concerns. Accordingly, Empire reached out to customers  
9 during the past several months using a variety of means to educate and inform, as well as  
10 listen and gain feedback.

11 Prior to deployment, the Company developed and made available for distribution  
12 an informational brochure, fact sheets, and a Q&A on key program attributes including  
13 benefits. Empire has also trained our business account teams, customer service  
14 representatives, AMI call center representatives, and field representatives to respond to  
15 customer questions. Furthermore, the Company developed informational videos and  
16 published deployment information and schedules. Links to these and other materials have  
17 been placed on a website landing page: [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters).

18 During deployment, if a customer is not present during the meter exchange, a door  
19 hanger containing information about the AMI project and smart meter benefits are placed  
20 on the customer's door. The hanger informs the customer that their meter was exchanged  
21 while they were gone, or that their meter was unable to be exchanged for reasons such as  
22 locked gates. In the case of an impediment to the exchange, the door hanger requests the  
23 customer call to schedule an appointment when the exchange can proceed. The door

1 hanger also includes some background information about the AMI Project and smart meter  
2 benefits as an informational piece.

3 After AMI deployment is complete, Empire will continue to engage with customers  
4 around the benefits of their smart meters and their energy management opportunities. The  
5 goal is to create two-way communication: we hope to share with our customers how the  
6 AMI-enabled information can help inform them of their energy use patterns, and we hope  
7 to hear from customers about their energy management needs. Examples of the  
8 communication material sent to customers are attached as **Schedule CCH-3**.

9 **Q. Is Empire offering an option for customers who do not wish to have a smart meter?**

10 A. Yes. The Commission initially approved Empire's request for a smart meter opt-out  
11 provision in its Order Granting Variance and Approving Tariffs dated March 18, 2020. On  
12 August 26, 2020, the Commission issued its Order Approving Tariffs which addressed  
13 Empire's default procedure of disabling the two-way communication portion of the AMI  
14 meter. Customers who do not wish to have a smart meter have the option to enroll in the  
15 opt-out program. As of March 11, 2021, only 530 Missouri customers have opted out of  
16 receiving a smart meter, representing about 0.36% of customers served to date under the  
17 AMI project.

18 The customer materials describing the opt-out program are included with **Schedule**  
19 **CCH-3**.

20 **Q. Are costs for the AMI implementation included in this rate case?**

21 A. Yes. Costs of AMI implementation are included in this rate case. Since the beginning of  
22 the project through September 30, 2020, Empire has invested \$28.5 million across its  
23 system. Empire is seeking to recover these costs of AMI in this rate case. The Company is

1 projected to invest an additional approximate \$14.9 million through June 30, 2021. The  
2 total cost of the project is described in the Company's AMI Project Costs, attached as  
3 **Schedule CCH-4**.

4 **Q. Does the AMI cost described above include any investment related to Empire's legacy**  
5 **meters?**

6 A. No. Empire witness Tisha Sanderson discusses the requested treatment of the remaining  
7 legacy meter investment in her testimony.

8 **Q. You previously mentioned that Empire was deploying AMI across all of its territories.**  
9 **Are costs for other states included in Schedule CCH-4, AMI Project Costs?**

10 A. No. Costs are direct assigned to each jurisdiction where possible. For shared costs, Empire  
11 allocated those costs based on the number of meters within each state. For example, the  
12 Company allocated costs paid to Itron for its services based on meter count within each  
13 jurisdiction.

14 **IV. AMI BENEFITS TO CUSTOMERS**

15 **Q. Does the implementation of AMI deliver benefits to Empire's customers?**

16 A. Yes. AMI is a customer-focused foundational technology that directly provides and enables  
17 greater convenience and transparency over a customer's energy consumption. The data  
18 that AMI will generate will touch nearly every part of Empire's business, improving the  
19 customer experience through enhanced customer care functions such in billing, customer  
20 service, outage management, testing and other activities.

1 **Q. How will the implementation of AMI deliver the benefit of convenience to customers?**

2 A. AMI technology delivers convenience to customers by enabling remote monthly and off-  
3 cycle meter reading; remote connect, disconnect, and reconnect ability; remote meter  
4 interrogation; and, in the future, offering due date flexibility. Remote monthly and off-  
5 cycle meter reading provides customers the benefit of convenience by transmitting usage  
6 information to Empire without the need for a technician to visit the customer's premise.  
7 With remote connect, disconnect, and reconnect ability, AMI provides convenience to  
8 customers of not having to schedule a technician visit when a customer wants to establish  
9 or cancel service. Further, customers who may become eligible to have their service  
10 disconnected for non-payment may have power more quickly restored using AMI's remote  
11 reconnect technology. With AMI technology, Empire will be able to interrogate a meter  
12 over the network to determine if it has power without having to send a truck to the location  
13 to test it, in some cases, avoiding a field visit. Finally, with AMI technology, customers in  
14 the future will benefit from increased flexibility around their payment due date.

15 **Q. How does AMI deliver the benefit of increased transparency and communication with**  
16 **customers?**

17 A. AMI technology will directly provide customers access to more pertinent and timely usage  
18 information. When a customer calls Empire's call center, customer service representatives  
19 will have detailed information about customer usage levels well beyond today's once-a-  
20 month 'snapshot' of energy use. Customer service representatives will also be able to share  
21 information about power outages, voltage alarms and other diagnostic information from  
22 the meter with the customer. Accordingly, the customer care representatives will be able  
23 to address customer inquiries more quickly and expertly with this information in hand.

1           Additionally, AMI technology enables customers who have a smart meter the  
2           ability to view and download detailed information about their hourly and daily usage  
3           patterns through the My Account portal, allowing them to more closely monitor their usage.  
4           Through AMI and My Account, customers are empowered to make informed choices  
5           regarding how they use energy and have the ability to potentially change their energy usage  
6           behaviors and reduce their energy costs. Additionally, the AMI investment is being  
7           integrated into the Company's efforts to increase communications about outages and  
8           restoration timelines after a storm.

9   **Q.   How will Empire integrate AMI into outage management activities?**

10  A.   AMI is an important tool for improving outage management capabilities. Empire has the  
11       capability to interrogate individual smart meters to determine if customers have power to  
12       confirm outages. Interrogating meters will assist the Empire restoration crews to improve  
13       their field work routing as they move about the outage area to restore power. The linemen  
14       and other field technicians will be able to confirm that an area is fully restored before  
15       heading off to address outages in another area.

16  **Q.   Will Empire's customers have new rate options as part of the AMI implementation?**

17  A.   With the capability to record and transmit interval usage data, AMI can provide  
18       information that helps enable new rate design. This additional data, combined with a new  
19       customer information system will provide the Company with expanded options and  
20       flexibility to support enhanced services and rate offerings. While broad implementation of  
21       new rates should occur after Empire has been able to evaluate sufficient interval usage  
22       information, Empire is initially proposing to implement a Time of Use program as  
23       discussed by Company Witness Gregory Tillman.

1 **V. OPERATIONAL BENEFITS**

2 **Q. Does Empire anticipate realizing operating benefits or efficiencies as a result of its**  
3 **AMI implementation?**

4 A. Yes. While Empire's AMI implementation is a foundational investment that will replace  
5 aging technology on the brink of obsolesce with an industry standard metering solution  
6 that will provide customers more control and transparency over their energy consumption,  
7 the Company anticipates it will realize operational efficiencies as a result of AMI.

8 **Q. Please describe the efficiencies Empire believes it will realize.**

9 A. Empire's AMI investment will enable monthly meter reading to be conducted remotely,  
10 avoiding the need to send a technician to read each meter on premise. Additionally, in  
11 many cases, Empire will be able to remotely perform connects, disconnects, and reconnects  
12 again avoiding a meter technician and vehicle expense. During storm restoration, AMI  
13 will enable Empire to interrogate a meter remotely to see if it is receiving power without  
14 sending a technician or truck.

15 **Q. Will Empire track progress it makes on realizing operational efficiencies from AMI?**

16 A. Yes. Once AMI is fully deployed, Empire plans to track the costs it otherwise would have  
17 incurred but for the deployment of AMI in monthly meter reading; off-cycle meter reading;  
18 remote connect, disconnect, and reconnect functionality; and, in storm restoration costs.

19 **VI. PROJECT GUARDIAN**

20 **Q. Like AMI, "Project Guardian" is mentioned in Empire's recently filed PISA report**  
21 **(the "Clean Transition Plan"). What is Project Guardian?**

22 A. As the risk of physical attacks on infrastructure increases, Empire is countering the risk  
23 through enhancements to the physical security measures of its substations through its new

1 substation security program known as Project Guardian. Projects in this program will  
2 upgrade deterrents like fencing, gates, and alarms, as well as install remote monitoring  
3 through video cameras, infrared cameras, and other sensors. Access controls will also be  
4 upgraded to limit substation access to only authorized personnel and to track access  
5 accurately. Empire intends to complete Project Guardian by 2025.

6 **Q. How will Project Guardian help system security and service reliability?**

7 A. Limiting access to substation infrastructure will reduce the risk of impacts to service from  
8 intentional and unintentional threats. Increased monitoring, sensing, and access control will  
9 also improve safety of employees and others by restricting access to only those that have  
10 received the proper training and authorization.

11 **Q. How were substations selected for Project Guardian?**

12 A. A list of ranking criteria for tiering substations based on the unique risk to each substation  
13 was developed. Risk is calculated based on the criticality of the site to Empire operations  
14 and its customers and the likelihood of a break-in at the site. The ranking criteria formed  
15 the basis for assigning tiers to Empire's existing 180 sites based on the identified weighted  
16 risk criteria.

17 **Q. Does the revenue requirement Empire is requesting in this case reflect the inclusion  
18 of any projects within Empire's new substation security program?**

19 A. Yes. Empire's requested revenue requirement in this case includes \$931,520 for two  
20 Project Guardian investments.

21 First, a substation physical security and reliability pilot project was implemented at  
22 an electrical substation located in Joplin, MO, referred to as Sub 109 Atlas Junction.  
23 Physical security and reliability technologies pertaining to security cameras, radar



1 scanners, deterrent lighting, thermal sensors, servers, and related video management and  
2 analytical softwares were investigated. A physical security technical integrator provided  
3 professional services in developing technical specifications and installation for solutions  
4 that met Empire's physical security and reliability goals and requirements. The physical  
5 security and reliability (equipment thermal monitoring) systems were installed,  
6 commissioned, and documented through developing detailed engineering drawings.  
7 Technical specifications were provided by all equipment vendors.

8 Also, in conjunction with the Sub 109 physical security and reliability  
9 implementation was the installation of a physical (SMC) security monitoring center. The  
10 center is located in our contact call center radio room in an existing facility located in  
11 Joplin, MO. The SMC requirements were also specified through a joint effort between  
12 Empire and the technical integrator. Currently in place are wall mounted monitoring  
13 screens and workstations that allow monitoring and alarm notifications to be received at  
14 this location. Presently, substation monitoring is performed by the existing call center staff.

15 **VII. CONCLUSION**

16 **Q. Please summarize why the Commission should approve Empire's AMI and Project  
17 Guardian investments.**

18 A. These investments are reasonable, were prudently incurred, and will benefit Empire's  
19 customers.

20 AMI is a customer-focused foundational technology that directly provides and  
21 enables greater convenience and transparency over a customer's energy consumption.  
22 Empire's decision to replace its aging metering infrastructure with an industry-standard  
23 AMI solution, is a reasonable and prudent one. Customers will have more access to data,

1 will engage with customer service representatives who have more information about a  
2 customer's account, and, in the future, will have access to more rate and program options.  
3 Additionally, customers will benefit from the future operational costs avoided because of  
4 the implementation of AMI.

5 Project Guardian, including the two specific projects discussed above, will help to  
6 counter the increasing risk of intentional and accidental physical threats on Empire's  
7 infrastructure and improve the safety of Empire's employees and the public.

8 **Q. Does this conclude your Direct Testimony?**

9 A. Yes, it does

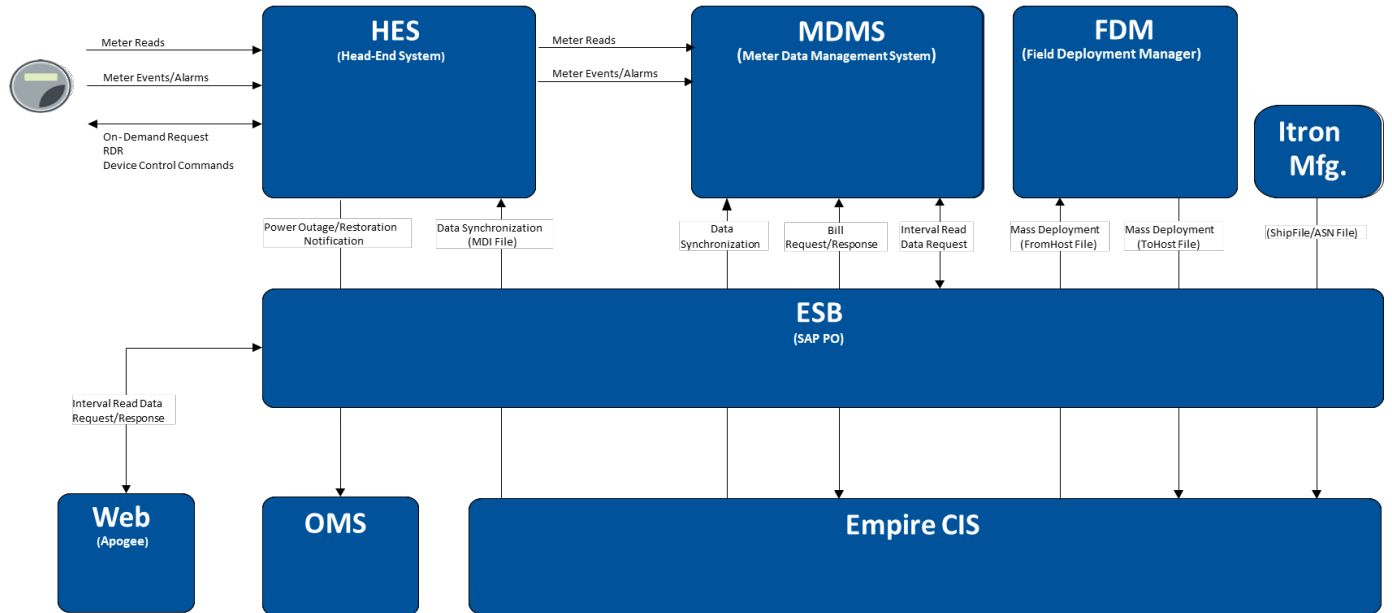
**VERIFICATION**

I, Chad C. Hook, under penalty of perjury, on this 28th day of May, 2021, declare that the foregoing is true and correct to the best of my knowledge and belief.

/s/ Chad C. Hook

# Schedules

**Schedule CCH-1: AMI System Components**



Schedule CCH-2: AMI Implementation Plan

Figure 1: Liberty Central U.S Installation Map and Timeline

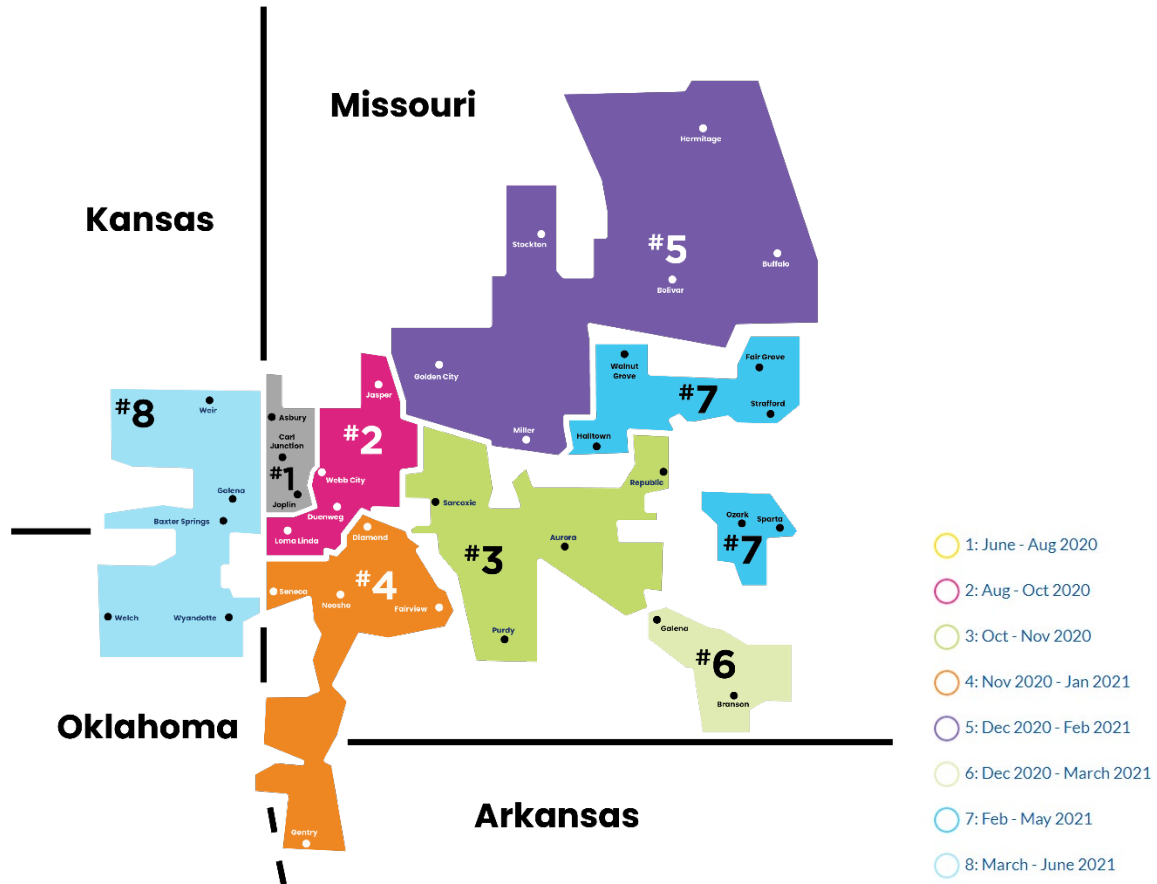


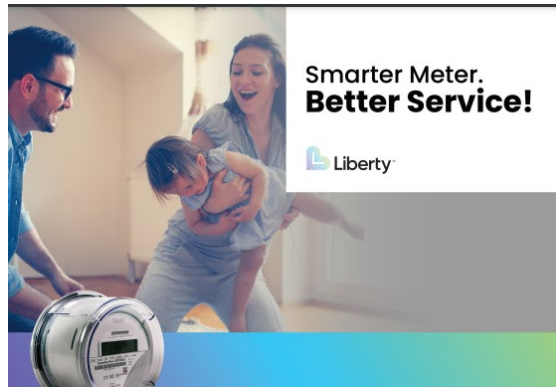
Table 1: Key Milestones for the Liberty-Empire AMI Initiative

| Activity and Milestone                              | Schedule Period and Milestone (if applicable)   | Description  |
|---|---|--|
| <b>Detailed AMI Implementation Planning Period</b>  | Milestone: Q1 2020<br><br>Substantially complete prior to field network and meter deployment.   | Completion of AMI implementation planning sufficient to enable the commencement of communication system network deployment and meter installation activities. Planning includes on-boarding the required communication system provider, field installation crews, and IT support resources. Liberty-Empire will staff internal project management and business process change management resources during this time as well. |
| <b>Installation of Field Communications Network</b> | Milestone: Q4 2020<br><br>Liberty-Empire expects a 3-4-month activity, preceding meter deployment.  | Deployment of 4g cellular capable field collectors and repeaters. Testing and initiation.  |
| <b>Meter Procurement</b>                            | Milestone: Q2 2020<br><br>During the planning period, meter procurement requirements will be finalized, and procurement schedules established for needed meter stock. | Planning and procurement of required AMI meter stock must begin well ahead of the actual meter installation. Liberty-Empire will work with its meter manufacturer to anticipate the meter procurement and delivery requirements so as to provide the necessary orderly support of the meter exchange process. This work involves the meter exchange processes, and meter programming.  |
| <b>Meter Installation Period</b>                    | Start Milestone: Q2 2020<br><br>Finish Milestone: Q2 2021<br><br>Phased behind network deployment to allow for smooth transition from manual to network meter reads.  | Liberty-Empire expects the complete meter installation period to last approximately 12-15 months. Liberty-Empire onboarded the meter installation contractors, which included customer contact and safety training. Then, Liberty-Empire project and IT staff, the meter manufacturer and the install contractor coordinated closely to ensure an orderly exchange of meters.  |
| <b>AMI System to Billing Integration</b>            | Milestone: Q3 2020  | Complete the “flat file” transfer protocols needed to support the transfer of AMI meter  |

|   |  |   |
|---|--|---|
|   | Integrations must be in place, tested and secured prior to first meter deployment.   | reading data to Liberty-Empire's current billing system.  |
| <b>Cut-over to AMI for Billing Support Purposes</b> | Milestone: Q4 2020<br>Phased and rolling process, proceeding in stages as meters are deployed.   | Utilizing a phased transition from manual meter reading, Liberty-Empire will cut-over the manual meter reading routes to AMI once the AMI system has achieved satisfactory read performance. Therefore, the number of meters transitioning from manual meter reading declines over this period as the number of AMI-support meters increases. |
| <b>Transition to Operations</b>                     | Completion Milestone: Q2 2021<br>Occurs in stages as network and meter operational performance is validated.   | Liberty-Empire expects transition of responsibilities to a steady state mode once the system is installed and performance is verified and stable.   |
| <b>Customer Engagement Activities</b>               | A progressive set of activities that involves building awareness, gaining input, addressing stakeholder questions, and ultimately gaining acceptance for the wide-ranging improvements that will be ushered in with AMI. Begins ahead of actual field deployment activities. | Liberty-Empire will begin an informal process of engaging with customers concerning the AMI initiative beginning in 2019-2020 timeframe and ahead of the actual field deployment activities. Efforts continue throughout the AMI system lifecycle.  |



Schedule CCH-3: Customer Communication Materials



**Smarter Meter.  
Better Service!**



**Liberty is Installing Smart Meters!**

Beginning in 2020, we're replacing meters throughout our service areas with smart meters.\* Smart meters are digital meters that allow for secure and automatic two-way communication. The equipment and technology, once fully installed and activated, will enable customers to access near real-time information about their usage, giving them more control and the opportunity to take action more quickly to manage costs.

\*Dates may vary as installation progresses. Watch [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters) for updated installation schedules.



**Meeting Your Needs Today and Tomorrow**

By December 2019, there were more than 98 million smart meters installed across the United States.\*\* Liberty is pleased to join utilities across the country in implementing this technology to improve our customers' experience, reduce costs through efficiency, protect our environment through lower emissions, and strengthen our electric, water, and natural gas distribution networks for safe and reliable service today and in the future.

\*\*Source: The Edison Foundation, Institute for Electric Innovation

For more information, visit [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters).



**What to Expect During Installation**

- Installation began in June of 2020.
- We will install or upgrade meters by geographic regions to ensure the transition is efficient and seamless. A map and schedule is available at [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters).
- Customers will receive a letter with additional details approximately four weeks before the installer arrives to change the meter at their home or business. This letter will include a phone number to call for specific questions or to schedule an installation time if you prefer.
- Customers do not need to be home during the meter exchange. In most cases, there will only be a brief interruption in service lasting just a few minutes. Installers will leave behind a door hanger with additional details regarding the work that was conducted.
- Installers will drive vehicles with signage identifying them as a Liberty contractor. Installers will also carry identification.



**Improving Your Customer Experience**

Once our smart meter project is completed within a service region and the technology is fully activated, customers will enjoy numerous benefits:

- Meter readings will be automated. This means few to no estimated bills.
- Automated meter readings provide cost savings with fewer service calls and service trucks on the road. This also reduces vehicle emissions, protecting the environment.
- Starting or stopping service will be done more quickly and efficiently.
- Customers can better track and manage usage throughout the month with near real-time usage data provided through a simple, user-friendly website portal.
- Smart meter information helps our service teams troubleshoot and resolve problems with equipment or services and provides timely outage and safety alerts. This helps customers by reducing the need for them to call to report issues or outages.
- Smart meters help to modernize the energy grid and our distribution systems. This helps to improve reliability and service restoration when an outage or issue occurs.
- Smart meters also help our clients plan for the future by providing precise analysis to help us design pricing plans and service options that match customer needs and energy and water use.



**Keeping Your Information Safe and Secure**

Liberty remains committed to safeguarding customer privacy.

- Smart meters do not transmit personally identifiable information such as names or account numbers. The information that is transmitted is done so over secure networks.
- Smart meter data is considered confidential and is protected by the same rigorous privacy and security safeguards that we use to protect other account information. Liberty will meet legal and regulatory standards and industry best practices, including ongoing security testing.



For more information, visit [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters).



### Smart Meter Opt-Out

Liberty is replacing meters throughout its service areas with smart meters. This secure technology and infrastructure upgrade provides numerous customer benefits:

- Automated meter readings resulting in few to no estimated bills
- Improved reliability and faster service restoration when outages occur
- Future access to near real-time usage data, giving customers more control and the ability to take action more quickly to manage costs
- Quicker and more efficient service starts and stops

### Opt-Out Fees

For all residential customers who choose to opt out and have their meter manually read, the following fees will apply:

- A \$45 per month manual meter-read fee, plus a \$10 per month fee for each additional manually read meter at the same address

For residential customers with an installed smart meter who request a manually read meter, the following fee will apply in addition to the monthly manual meter-read fee:

- A one-time \$150 setup fee per meter

To opt out, residential customers must call:  
Liberty Customer Service

**800-206-2300**

Please call within 48 hours of receiving this card.

Date card left with customer: \_\_\_\_\_

## Smart Meters vs. Manually Read Meters

Before opting out, please consider the following smart meter advantages.

| Features & Benefits for Customers   | Smart Meter | Manually Read Meter   |
|---|-------------|---|
| Automated meter reading – few to no estimated bills   | ✓           | ✗   |
| Improved reliability and faster service restoration when outages occur  | ✓           | ✗   |
| Future access to near real-time usage data for more control and the ability to take action more quickly to manage costs | ✓           | ✗   |
| Quicker and more efficient service starts and stops   | ✓           | ✗   |
| Meter setup fee   | None        | \$150*  |
| Monthly meter-read fee  | None        | \$45, plus \$10 for each additional meter at the same address |

\*For residential customers with an installed smart meter who request a manually read meter. This is in addition to the monthly manual meter-read fee.



Learn more at: [www.libertyutilities.com/smartmeters](http://www.libertyutilities.com/smartmeters)

## Schedule CCH-4: AMI Project Costs

| <b>The Empire District Electric Company</b> |   |                        |   |                                      |   |
|---|---|------------------------|---|--------------------------------------|---|
| Test Year Ending September 30, 2020         |   |                        |   |                                      |   |
| ER-2021-0312                                |   |                        |   |                                      |   |
| Schedule 2 - Rate Base                      |   |                        |   |                                      |   |
| Line No.                                    | Description                               | Reference              | Total Missouri Test Year Ending Balance | Total Missouri Pro Forma Adjustments | Total Missouri Pro Forma Ending Balance |
|   | (a)                                       | (b)                    | (c)                                     | (d)                                  | (e) = (c) + (d)                         |
| 1   | Plant in Service:                         |                        |   |                                      |   |
| 2   | Plant in Service                          | Gross Plant Tab        | \$ 12,833,742                           | \$ 23,654,446                        | \$ 36,488,188                           |
| 3   | Accumulated Depreciation/Amortization     | Accum Depr Tab         | 215,787                                 | 1,020,580                            | 1,236,366                               |
| 4   | Net Plant in Service                      | (Line 2 - Line 3)      | 12,617,955                              | 22,633,867                           | 35,251,822                              |
| 5   | Working Capital:                          |                        |   |                                      |   |
| 6   | Cash Working Capital                      |                        | -                                       | -                                    | -                                       |
| 7   | Prepayments                               |                        | -                                       | -                                    | -                                       |
| 8   | Materials, Supplies, and Fuel Inventories |                        | 13,435,964                              | (13,435,964)                         | -                                       |
| 9   | Additions and Deductions:                 |                        |   |                                      |   |
| 10  | Customer Deposits                         |                        | -                                       | -                                    | -                                       |
| 11  | Customer Advances                         |                        | -                                       | -                                    | -                                       |
| 12  | Regulatory Assets                         | Stranded Meters        | 2,558,790                               | 6,451,852                            | 9,010,642                               |
| 13  | Regulatory Liabilities                    |                        | -                                       | -                                    | -                                       |
| 14  | Accumulated Deferred Income Taxes         | Plant & Depr & ADIT WP | (91,419)                                | (691,383)                            | (782,802)                               |
| 15  | Total Rate Base                           | Sum Lines 4 through 14 | \$ 28,521,290                           | \$ 14,958,372                        | \$ 43,479,662                           |