ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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May 3, 2021

VIA ELECTRONIC FILING

Utah Public Service Commission
Heber M. Wells Building, 4th Floor
160 East 300 South
Salt Lake City, UT 84114

Attention: Gary Widerburg
Commission Administrator

RE: **Docket No. 21-035-16 – In the Matter of the Collaborative Stakeholder Process for Rocky Mountain Power's Grid Modernization and Rate Design**

Pursuant to the Scheduling Order and Notices of Technical Conference, Comment Period, and Scheduling Conference issued March 17, 2021 in the above referenced docket, Rocky Mountain Power (the "Company") hereby submits its Informational Filing to initiate the collaborative stakeholder process.

The Company respectfully requests that all formal correspondence and requests for additional information regarding this filing be addressed to the following:

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Sincerely,

Joelle Steward
Vice President, Regulation

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Informational Filing:
Docket No. 21-035-16

AMI Project, Grid Modernization, Advanced Rate Design

May 3, 2021

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Purpose

The purpose of this document is to provide an informational filing, as required by the Utah Public Service Commission Docket No. 21-035-16, on Rocky Mountain Power's (Company) Advanced Metering Infrastructure (AMI) deployment and associated grid modernization and potential new advanced rate design options. This information will provide baseline information for participants to engage in a collaborative stakeholder process to consider and discuss potential rate design and cost of service methodology changes.

This paper is designed to provide the reader with a basic understanding of the Company's roadmap and how it may chart the current and future delivery and planning strategies. It is not intended to provide a detailed level of understanding or an ideological explanation of the functionality behind every technology that can be used to migrate strategies or include a consideration for the replacement of the current technologies.

Advanced Metering Infrastructure for Utah and Idaho

AMI provides enhanced data and control capabilities by collecting interval data from meters on a daily basis. This interval data can be used for time-based rates and critical peak pricing programs. More advanced AMI systems can include direct device control, customer notification or integration of in-home displays through two-way communications. These systems provide added benefits in the form of outage detection and restoration messages via the system.

AMI provides the communication systems upon which many grid modernization programs can be built including outage management, distribution automation (DA), demand response (DR), etc.

In 2016, Company affiliate Pacific Power identified economical AMI solutions for California and Oregon that delivered tangible benefits to customers while minimizing the impact on consumer rates. In 2019, Pacific Power completed installation of the Silver Spring Networks Gen5 AMI across its Oregon and California service territories (Silver Spring Networks was subsequently acquired by Itron). The AMI system consists of head-end software, field area networks and approximately 656,000 Aclara meters. The Company is using lessons learned from this completed project for the AMI Project in Utah and Idaho.

Utah/Idaho AMI Project

In 2018, the Company awarded a contract to Itron for their OpenWay AMI system in the states of Idaho and Utah. In early 2020, Itron proposed changing to the Gen5 system acquired from Silver Spring Networks for the information technology (IT) and network systems rather than their OpenWay system. The proposal retained the more advanced Riva meter technology for deployment. This change aligns the Company with the same IT and network devices used in Pacific Power's Oregon and California service territories. This solution also aligns with Itron's future road

map and provides PacifiCorp with a single operational system. This provides a stronger, more flexible network coupled with a high-end metering solution that provides the security framework to protect customer data.

The Utah/Idaho project involves upgrading the head-end software and installation of a field area network and approximately 240,000 new Itron Riva AMI meters across most customer classifications and 20,000 Aclara AMI meters for Utah rate schedule 136 private generation accounts.

In Idaho, the project will replace all current meters with new Itron Riva AMI meters. Automatic Meter Reading (AMR) was not fully deployed there due to the high number of time-of-use customers. Furthermore, the project will leverage the customer communication process and materials developed for the Oregon and California AMI projects in both Utah and Idaho.

Project Schedule

The first phase of IT upgrades is nearing completion and field network installations have begun in Idaho. Installations will progress from Idaho southward through Utah with completion of the network by December 2021.

Meter installations follow network completion; this development sequence ensures the meters communicate accurately with the network. Installations are scheduled to commence in October 2021 with full project optimization and completion by the end of 2022.

AMI Roadmap for Grid Modernization

AMI adoption is a fundamental early step and a primary vehicle to enable grid modernization. AMI is not a single technology, but rather a complex infrastructure that needs to be effectively integrated into the Company's existing processes and applications. The Company's primary driver for AMI deployment relates to installing advanced meters for lowering meter reading costs, faster outage response, improved billing accuracy, flexibility/lower cost for time-based rates, and enhanced awareness of real-time energy consumption. However, the Company continues to explore opportunities to leverage the AMI system for other grid modernization use-cases. The Company's AMI roadmap and its use for future grid modernization activities will depend on various enabling factors such as technology readiness, geography, communications infrastructure, IT infrastructure and the customer benefit and value proposition.

The Company is implementing an advanced metering network in Utah. This system provides immediate cost savings and establishes a communications infrastructure that can be used for future grid modernization applications. With applicable upgrades, the network will accommodate both normal and emergency operation of the electric distribution system and will be reliable and resilient, especially during the first critical moments of any large-scale disturbance to the system.

Rocky Mountain Power - AMI Roadmap

Technology	PacifiCorp Business Driver						Potential Timeframe* (in years)
	Outage Management	*SAIDI Improvement*	*Voltage Management*	*Wildfire Mitigation*	*Distribution Planning*	*Customer Satisfaction*	
Outage Management using existing AMR meters	PoC	PoC					0 - 1
Advanced Distribution Management System (ADMS)	Evaluate	Evaluate	Evaluate	Evaluate		Evaluate	0 - 7
Communicating Faulted Circuit Indicators (CFCI)	Evaluate	Evaluate		Evaluate	Evaluate	Evaluate	1 - 3
Fault Location, Isolation and Service Restoration (FLISR)	Evaluate	Evaluate		Plan		Evaluate	0 - 5
Interactive Volt-Var Optimization (IVVO)			Evaluate		Evaluate		2 - 5
Electric Vehicle					PoC	Evaluate	0 - 5
Demand Response - Load Control					Evaluate	Evaluate	0 - 3
Energy Usage Tools						Implement	0 - 1

LEGEND - Phase of Development

Stage	Definition
Evaluate	*Technologies/solutions that are being considered for active use. Technical reviews, business cases and/or associated planning activities are ongoing.*
Proof-of-Concept (PoC)	*A proof of concept project for an approved technology/solution in support of a business case. Testing is usually completed in a lab environment prior to pilot testing in a field application.*
Implement	*Technology/solution is either in development or ready for wide scale deployment.*

Note:

** Year 0 is assumed to be December 2022 when the AMI system is fully operational and ready to be leveraged for grid modernization applications*

Blank cells indicate the technology does not support the business driver

Figure 1: Rocky Mountain Power AMI Roadmap

The AMI roadmap for grid modernization typically starts with a singular technology, in this case an advanced metering network, and then may grow and mature adding new technologies and processes over time. As illustrated in Figure 1, the road map, by necessity, involves several independent technologies that will develop and converge over time to produce a modernized grid that benefits customers. These technologies may be implemented in the future depending on how each technology integrates with the AMI system and its subsequent applicability in solving specific business and customer needs.

An overview and discussion of these technologies and any related projects are presented below.

Outage Management Using Existing AMR Meters

The Company filed for and received funding approval through the Utah Sustainable Transportation and Energy Plan (STEP) to provide for the development of technology to enable the Utah AMI system to collect and transmit data from the existing AMR meters. The technology being developed by Itron is an ERT Gateway Mesh ("EGM") field device and allows the AMI system to utilize over 80% of the existing AMR meters in the network. The AMR meters will be able to provide hourly interval data as well as power outage and restoration messages for residential and small commercial customers.

With the completion of the AMI network in Utah, the outage management system will begin receiving outage notifications directly from both existing AMR and new AMI meters. These

notifications accelerate the information flow and improve outage response times by reducing the dependency on customer calls during outage events. During the past two years, a concerted effort on improving outage response in Pacific Power using AMI data has shown significant improvements, especially in single-service outage situations. Similar AMI system-based improvements will enable faster integration of AMI outage notifications in Utah.

Advanced Distribution Management Systems (ADMS)

The current Outage Management System ("OMS") relies on the Energy Management System and inbound contact to the Customer Call Center to initiate outage report within the ABB OMS application.

With the introduction of the AMI technology, there will be increased efficiency on outage identification for operations. With appropriate head-end filtering, the AMI status will be transferred into the OMS system and will be available both to create the associated outage notification, and to aggregate with other outage inputs, to confirm an outage.

With the increased buildup of real-time distribution telemetry using AMI, the OMS may develop into a combined Distribution Management System ("DMS") and OMS with a natural enhancement into a fully integrated ADMS.

Areas typically supported by an ADMS include:

- Outage management
- Switching operations
- Lock-out and tagging procedures
- Fault calculations
- Load flows
- Near real-time state estimation routines
- Active voltage management
- DR for identified load resources
- Smaller scale distributed energy resource (DER) management
- Direct control of the distribution system

Advanced distribution management systems create an intelligent distribution network model that provides ongoing data analysis from field deployed, AMI-enabled intelligent end devices (IED) to maximize the efficiency and operability of the distribution network. A complete ADMS provides distribution engineers with near real-time system performance data and historical performance metrics.

Communicating Faulted Circuit Indicators (CFCI)

In June 2019, the Utah Public Service Commission approved the Company's application for funding as provided for in STEP for the Advanced Resiliency Management System (ARMS) project. The ARMS project provides for the installation of communication radios on distribution line equipment, and the deployment of additional line sensor technology on distribution circuits connecting critical customers to enable real-time communication with the Company's control center. For the purpose of this project, critical customers are defined as major emergency facility centers such as hospitals, trauma centers, police and fire dispatch centers, etc.

The Company and its customers see the ability to remotely monitor, measure and control various distribution line equipment as a necessity in building an advanced grid that inherently improves safety, reliability and customer service. The ARMS project is expected to help the Company understand ways to address the following challenges:

- Limited visibility of real-time status of distribution line equipment, circuit loading levels and event information leads to increased outage duration and restoration times.
- Lack of information from distribution line equipment creates inefficiencies in managing outage response situations. Predictive outage management and fault-locating software rely on loss-of-service reports from multiple customer locations to estimate fault locations. Changing customer behavior and expectations are decreasing the number of reports received for each outage event thereby reducing the effectiveness of current systems.
- The Company is striving to make the grid more advanced and this project will lead us in that direction.

The ARMS project will deploy CFCIs[i] to address the aforementioned challenges. These devices have the capability to use the AMI Gen5 system, however since the Company's AMI system is still in development, the CFCI devices will initially be powered using a cellular network. In 2021, the Company plans to install over 500 devices to provide situational awareness of distribution system conditions and other information to control center operators during sustained outage conditions and enable faster restoration of power to critical customers. These devices also have the capability to monitor real-time loading for distribution planning. Once the AMI system is fully operational, the Company plans to explore installing CFCI devices using the AMI communication infrastructure.

Fault Location, Isolation and Service Restoration (FLISR)

A fault location, isolation and service restoration (FLISR)[ii] program employs strategically placed communicating distribution reclosers, motor-operated switches and fault detection devices to automate restoration. FLISR is one of the more effective applications of distribution automation (DA) technology and can potentially improve utility performance metrics such as the system

average interruption duration index (SAIDI) and the system average interruption frequency index (SAIFI).

In March 2018, Pacific Power began implementing a FLISR pilot program in Lincoln City, Oregon. The protection scheme uses the Gen5 network for communication between field protective devices. Known as the Devil's Lake DA project, this pilot has been progressing for the past few years in terms of design, installation and troubleshooting the system. In May 2021, the project team will evaluate the field area network's overall performance. The Company is closely following this pilot project and hopes to implement the same system in key areas of Utah. As the pilot continues to mature and lessons learned are processed, the Company will be in a better position to evaluate, install and manage similar potential solutions.

Interactive Volt-Var Optimization (IVVO)

When IVVO[iii] functionality is fully integrated, the Company's control center can manage voltages to minimize line losses and energy needs while optimizing the delivery of energy to consumers. The AMI system can be leveraged to enable real-time communications at various devices on the distribution system, e.g., regulators and capacitor banks. Historical or real-time data gathered from these devices can be integrated into the Company's control center or distribution planning tools to optimize the system for potential opportunities such as voltage reduction, load reduction or loss reduction. The data also be used for equipment failure[iv] analysis and developing maintenance programs.

Demand Response

DR programs include both direct and indirect load control programs to reduce the overall energy consumption during both routine and critical times. Indirect load control encourages customers to change energy usage patterns is by making energy usage data available and providing pricing signals that encourage changes in the time energy is utilized.

Indirect Load Control

Indirect load control in its simplest form can be achieved by utilizing AMI data to allow consumers to make better decisions on energy usage. By understanding how, when and why energy is used, customers can begin to change their behavior, which provides overall reductions in energy used. The Company's AMI project sets the stage for this through the development of a customer-centric website to make this data readily available.

In addition to providing energy usage data, AMI enables more advanced pricing programs that could help encourage customer energy use behavior changes. The most common price signals in the industry today are time-of-use (TOU), critical peak pricing (CPP) and peak time rebate (PTR)

programs. TOU tariffs charge customers different prices at various times during the day. The most common TOU programs have on-peak and off-peak pricing components and a few also incorporate shoulder pricing. CPP schemes are included in more advanced pricing structures to encourage conservation of energy during those few hours, typically 100 hours or less, each year when electrical demand peaks and places stress on the system. The AMI system enables the Company to explore these pricing options and design unique pricing programs that will provides customers different options based on their needs.

Direct Load Control

The Company has provided a comprehensive set of demand-side management (DSM) programs to its customers since the 1970s. The programs are designed to reduce energy consumption and more effectively manage when energy is used, including management of seasonal peak loads. Currently the Company offers the following direct load control programs in Utah:

- Cool Keeper – air-conditioning load control
- Irrigation Load Control – agricultural irrigation pump program
- Wattsmart Batteries – behind-the-meter battery storage

The Company's AMI program, once fully operational, may allow it to better quantify load curtailment during direct load control events. AMI may also benefit the Company through new opportunities for behavioral DR programs. Once the AMI communication network has been installed, the communication infrastructure may create cost effective opportunities to procure new programs and/or expand existing ones.

The Company's control technology and load management practices employed are some of the most advanced in the industry. Together with the Company's conservation and energy efficiency efforts, these practices demonstrate that the Company is actively engaged in improving the efficiency and management of its system by employing education, equipment and price incentives to optimize system performance.

Electric Vehicles

Electric vehicles (EV) are becoming more widely accepted as the technology advances and the vehicle purchase price becomes more competitive with gasoline-powered vehicles. It is commonly accepted that widespread adoption of plug-in electric vehicles may have a large impact on the electrical distribution system. Future battery technologies and plug-in electric vehicle enhancements may lead to utilizing plug-in electric vehicles for vehicle-to-grid energy supply for DR. Currently the Company expects plug-in electric vehicles to only be a new load on the system; continued future development and innovation is required to utilize this customer technology as a

distributed energy resource (aka vehicle-to-grid). To this effect, understanding customer behavior and electrical usage through AMI data, will be key in developing customer-centric programs.

Energy Usage Tools

As part of the Company's commitment to increase customer satisfaction, the Company's website (www.rockymountainpower.net) has been enhanced to provide more detailed usage information for future AMI and existing Automatic Meter Reading (AMR) customers. The customers will have access to energy usage graphs online once they log on to their account on the www.rockymountainpower.net website. The graphs will depict available near real-time hourly, daily, weekly, monthly, and annual consumption data. Business customers will also have 15-minute interval data available. This functionality enables customers to make informed energy decisions and to manage their costs. Figure 2 shows an example from the Company website where a customer will be able to view their energy usage. This same data will also be available on the mobile application and via billing notifications.

Figure 1: Daily, Weekly and Monthly Customer Energy Usage

Green Button

Using the industry standard *Download Green Button Data* functionality, customers will be able to download up to 24 months of usage data and securely transfer that data to third-party services who provide assistance in monitoring and managing energy usage. Figure 3 shows an example from the Company website of downloadable Green Button data and usage history.

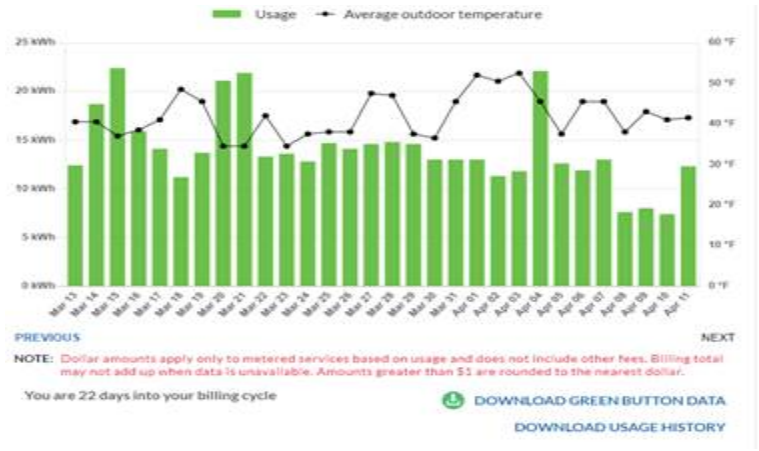

Figure 2: Downloadable Green Button Data and Usage History

Monthly Bill Projection

This functionality that projects electric usage will also be available to Company AMI and AMR customers. Customers will be able to establish a billing threshold by entering a target dollar amount online in a simple and easy-to-use way. If a billing projection exceeds the target amount, the customer will be notified via text or email. Subsequent communications will continue weekly for the customer to help them see whether their energy consumption decisions are moving their bill projection downward. Figure 4 shows an example from the Company website where a customer can set up bill projection notifications, as well as their other communications preferences.

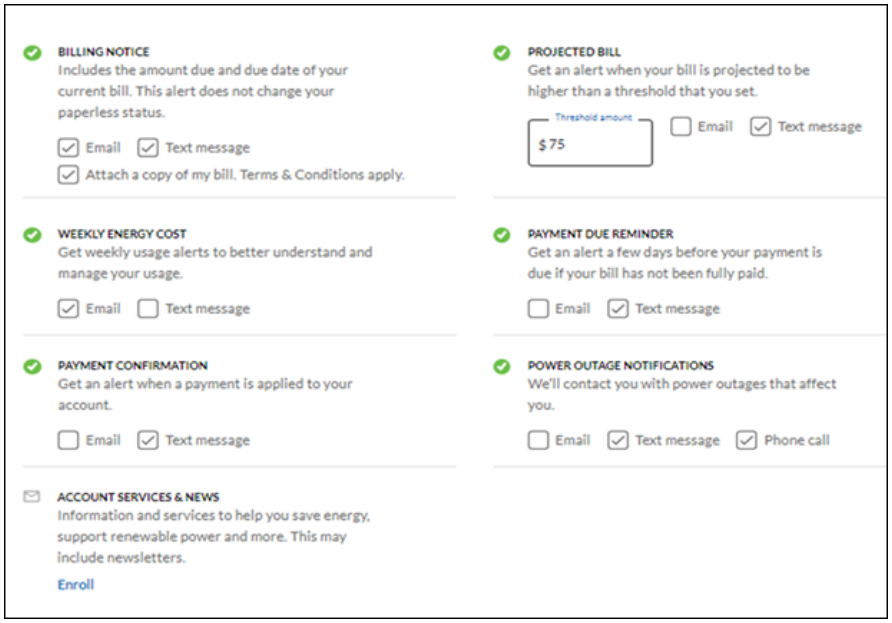

Figure 3: Bill Projection Notification and Other Communication Options

Advanced Rate Design

The Company's deployment of an AMI network in its Utah jurisdiction is a prerequisite for advanced rate designs that could be offered to most of its customers. However, changes to the Company's billing system would also be required to facilitate new rate designs. While manually billed options like the interruptible and real-time pricing pilots proposed in its general rate case could be offered for a limited number of larger customers, providing such options for the mass market absent both the AMI network and changes to the Company billing and/or metering systems would be impractical. The Company has initiated a process to replace its legacy billing system and anticipates that it will be available beginning around the 2024 timeframe.

At present the Company plans to pursue advanced rate design to modernize its opt-in TOU programs for residential (Schedule 2), irrigation (Schedule 10 time-of-day [TOD] option), and non-residential (Schedule 6A) after AMI is deployed and as part of a future general rate case. With conventional metering technology, a physical site visit and meter replacement are required for customers to participate in a TOU program. A physical visit and reprogramming of the meter are also required if the TOU periods need to be altered. With AMI, a customer's meter can be remotely reprogrammed. AMI enables the Company to provide new and improved opt-in TOU programs for its customers without the stranded cost of installing new legacy non-AMI meters and with the flexibility to change TOU periods in the future as conditions evolve. Providing opt-in TOU programs is supported by the current billing system and the planned AMI network deployment.

Providing more advanced options and/or defaulting all customers onto a TOU program(s) from which customers would need to opt-out ("opt-out time of use") would come with incremental cost to the Company's current plans and would also take time to implement. Confidential Table 1 below shows high-level estimates of the cost to implement different advanced rate design options:

Confidential Table 1

The Company is carefully weighing the implications of these advanced rate designs. It does believe, however, that there must be a plausible net benefit before investment is made to implement such programs. The Company hopes to discuss advanced rate designs with stakeholders in the collaborative sessions scheduled as part of this docket. Below are some high-level descriptions of potential advanced rate designs:

Opt-In Residential TOU: Residential rate where the energy price is different during different time periods and customers voluntarily participate or opt-in to the program. Examples are Schedule 2 and Schedule 2E.

Opt-Out Residential TOU: Default residential rate where energy price is different during different time periods. Customers must affirmatively de-enroll or opt-out of the program to be on traditional non-time varying rates.

Changes to Nonresidential TOU: Modifying the TOU periods for existing opt-in non-residential Schedule 6A and the TOD option for irrigation Schedule 10.

CPP: Program where participating customers pay much higher rates during limited time events called by the utility during adverse grid conditions (i.e., peak usage on a hot summer day, generator outage, high market prices, etc.). Presumably, customers enrolled in the program would receive some form of rate discount or bill credit for their participation.

PTR: Similar to CPP, but customers are rewarded for load reductions during limited time events called by the utility instead of being charged higher rates during those events. The determination of how much load each participant sheds during events can be complicated and require the Company's systems to run sophisticated algorithms for each participant.

Real-Time Pricing: Similar to a TOU option, but where prices vary during more than just two or three periods in a couple of seasons. For example, this could be a program where prices vary during every hour of the year. Prices are generally announced on a day-ahead or hour-ahead basis.

Interruptible Pricing: Program where customers must curtail some designated portion of their load during events called by the utility in exchange for a bill credit or rate discount.

Conjunctive Billing: Program where a customer with multiple sites can pool its different meters, so that demand charges are determined from a unified load profile.

Topics for the Collaborative Stakeholder Process

The Company believes that it is important for the collaborative stakeholder process to address topics related to both rate design and class cost of service. The need to modernize the Company's cost of service methodologies was a well-developed theme in the different rounds of testimony

submitted during the Company's rate case. Improvements to the Company's cost of service approach can be technical and hard to address during a litigated ratemaking proceeding. If cost of service is not a part of the collaborative stakeholder process, a significant opportunity would be missed.

Similarly, retail rate unbundling is a topic that should be explored in the collaborative stakeholder process. Specifically modifying how base net power costs are recovered from customers and ultimately flow through the energy balancing account mechanism is an important means of resolving Company concerns about embracing more advanced rate designs.

As expressed in comments submitted on the collaborative stakeholder process, the Company continues to recommend that the collaborative sessions cover at a minimum the following topics:

- Retail rate unbundling
- Generation and transmission cost of service methodology
- Distribution cost of service methodology
- Advanced rate design for residential customers
- Advanced rate design for nonresidential customers
- Conjunctive billing
- Options for large customers

Conclusion

This report provides an overview of the Company's strategic plans in Utah as they relate to AMI. As the Company continues to develop and refine its AMI roadmap, it maintains near- and long-term goals for grid modernization with a customer-centric approach. AMI is also an important pre-requisite for improving existing customer programs like time of use as well as for potentially offering more advanced rate options like peak-time rebate. By pursuing the technologies outlined in this document, the Company anticipates continual improvement of system efficiency, reliability and safety, while maintaining its commitment to providing a cost-effective service to our customers. The Company looks forward to engaging in a collaborative stakeholder process where future rate designs and cost of service methodologies may be explored.

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[i] *CFCI devices are designed for distribution system voltages to monitor the line current and indicate the passage of fault current when an event occurs downstream of the device. Knowing the last device to report a faulted condition, allows repair crews to move to the damaged area more quickly. This eliminates the time-consuming line patrols and reduces operating costs and outage times.*

[ii] *The FLISR devices communicate status and operational information back to the local distribution automation (DA) controller or ADMS, which determines the faulted section of the system and then issues command signals to automate restoration to areas outside the fault zone where adjacent circuit capacity exists. The switching is typically done within a few minutes. Once all automated restoration switching has been completed, the local DA controller ADMS can notify the distribution dispatch center of the faulted zone. Repair crews are notified and dispatched directly to the area of the fault to identify the cause of the outage and make the repairs. This eliminates the time-consuming line patrols and manual switching typically needed to identify the faulted area and restore power outside the zone and mitigates human-caused switching errors.*

[iii] *An IVVO program utilizes strategically placed distribution voltage regulators and capacitor banks for voltage and power factor management, reducing the line losses due to reactive current.*

[iv] *The IVVO system's reporting capabilities can detect when a capacitor bank has operational problems without manual inspection, which will help reduce the cost of annual inspection work.*

CERTIFICATE OF SERVICE

Docket No. 21-035-16

I hereby certify that on May 3, 2021, a true and correct copy of the foregoing was served by electronic mail to the following:

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