Witness OCS – 4D

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF ROCKY MOUNTAIN POWER'S SUSTAINABLE TRANSPORTATION AND ENERGY PLAN ("STEP") ACT INITIATIVES	)))))	DOCKET NO. 16-035-36

DIRECT TESTIMONY

OF

GAVIN MANGELSON

FOR THE OFFICE OF CONSUMER SERVICES

MARCH 7, 2017

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Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Gavin Mangelson; I am a Utility Analyst for the Office of Consumer Services (Office). My business address is 160 East 300 South, Salt Lake City, Utah 84111.

Q. PLEASE DESCRIBE YOUR EDUCATION AND EXPERIENCE.

A. I received a B.A. in Economics from the University of Utah in 2008. I have worked for the Office for three and a half years, during which I have testified before the Public Service Commission (Commission) in four other dockets and have submitted comments in numerous dockets. Prior to my employment with the Office I was a Financial Analyst for the Utah Department of Technology Services where I worked in forecasts and rate design.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present the position of the Office regarding the proposal of Rocky Mountain Power Company (Company) to include Advanced Substation Metering as part of the STEP program. I will address the direct benefits of substation meters and their role in identifying and implementing solutions to system constraints.

Q. WHAT IS BEING PROPOSED IN REGARDS TO SUBSTATION METERS?

A. The Company is proposing to spend $1.1 million dollars between 2017-2019 to purchase and install meters on approximately 50 circuits connected to distribution substations. This proposal is being made as part of the five-year STEP pilot program.

Q. PLEASE IDENTIFY WHICH MATERIALS FILED OR PRESENTED BY THE COMPANY IN THIS PROCEEDING SPECIFICALLY SUPPORT SUBSTATION METERING.

A. The proposal to include Advanced Substation Metering as part of the Innovative Utility Program under STEP is supported by the Application on pages 20-23, the Direct Testimony of Douglas L. Marx, and by Exhibit "C," to the Application, all filed on September 12, 2016. Substation meters were also explained in the technical conference held on December 6, 2016, the presentation materials were filed with the Commission the same day.

Q. PLEASE EXPLAIN HOW THE PROPOSAL FOR SUBSTATION METERS PERTAINS TO THE STEP PROGRAM.

A. The Company's request is made pursuant to Utah Code Ann. § 54-20-105, Innovative Utility Programs. According to the Direct Testimony of Mr. Marx (lines 25-26) the request for substation meters should be classified under section 54-20-105(1)(c) "an electric grid related program" and/or section 54-20-105(1)(h) "any other technology program."

The statute states that the Commission *may* authorize such a program if it determines that it is "in the interest of large-scale utility customers." Section 54-20-105(1).

Q. PLEASE BRIEFLY EXPLAIN THE PURPOSE OF A SUBSTATION METER.

A. Unlike a typical meter attached to a home which measures and records customer usage, a substation meter is a device capable of measuring load levels and load profile, in addition to the power flow at the circuit to which it is connected. The purpose of the substation meter is to provide accurate information about a portion of

the system in order to better understand localized system demands and potential system constraints.

Q. WHAT DOES THE COMPANY ASSERT ARE THE BENEFITS OF THE SUBSTATION METERING PROGRAM?

A. The Company asserts the primary benefit of the proposed meters as their ability to provide system information. According to the Direct Testimony of Mr. Marx, the installation of the proposed substation meters will provide "greater data visibility of the distribution system and integration of distributed energy resources" (Marx Direct lines 36-37). Such information is expected to be useful in identifying system constraints, particularly those that may be caused by Distributed Energy Resources (DER).

Exhibit "C" contains nine bullet points that address benefits of the information obtained from the proposed meters in terms of the various types of potential harm that the information is expected to identify, particularly load imbalances and harmonic disturbances caused be DER. Several of the bullet points employ specifically technical language in describing the types of potential constraints in a manner that appears designed to make a more impressive statement of benefits. Further, the second bullet point may be interpreted to indicate that the meters have broader technical abilities than they actually have, when it states: "Assists in preventing load imbalances." Ultimately, a careful reading shows that the principle benefits asserted by the Company are derived from the fact that the meters will provide information about power flows on the grid, that this information can be used to identify potential stresses impacting the reliability of electrical equipment, as well

as to identify necessary solutions to existing system constraints. Mr. Marx does not discuss in detail the risks introduced to the system by DER, but states that the proposed meters will "help identify and control risks associated with the integration of significant penetration of distributed energy resources" (Marx Direct lines 54-55).

As additional benefits, Mr. Marx further states that metering "will provide information necessary for a more progressive grid" (Marx Direct line 41-42), and the seventh bullet point in Exhibit "C" states that the proposed meters will "Reduce time delays of approvals for customers seeking distributed generation interconnections," however the existence of time delays within the current approval process is not otherwise supported in the exhibit.

My testimony addresses the potential benefits listed below:

- Whether substation meters facilitate increased penetration of DER,
- Whether substation meters may reduce time delays for DER interconnections,
- Whether DER has been shown, in this proceeding, to create problems on the system,
- Whether substation meters have been shown, in this proceeding, to remedy certain potential problems, and
- How substation meters may facilitate a "more progressive grid."

I will conclude by providing the Office's position regarding the proposed advanced substation metering program.

Q. HOW DO SUBSTATION METERS FACILITATE INCREASING LEVELS OF DER?

A. Substation Meters do not directly facilitate the integration of DER on a circuit. Rather, the information provided by substation metering can verify that the additional DER will not compromise the integrity of system components operating on the circuit, or provide the information necessary to determine what measures are required to allow the circuit to accommodate additional DER.

Q. HOW DO SUBSTATION METERS REDUCE TIME DELAYS FOR CUSTOMERS SEEKING DER INTERCONNECTIONS?

A. The supporting documents do not provide additional information about existing time delays in the current approval process, however, potential time delays were the subject of limited discussion at the December 6, 2016 technical conference. In that discussion Company representatives indicated that a customer seeking a DER interconnection may face significant delays if the Company suspected and could not immediately verify that the intended circuit may be near capacity for DER. Such a case would require a more time intensive study to determine the viability of the circuit to host additional DER, a study that would not otherwise be necessary if the information was already available through the proposed substation meter installations.

Q. DO CURRENT LEVELS OF DER CREATE PROBLEMS ON THE DISTRUBUTION SYSTEM?

A. At this time the Company does not have any information that constraints are indeed occurring. The Office asked the Company for any documentation, records, or evidence regarding this potential issue in a data request (OCS DR No. 8.2). The Company indicated in its response that “to date, and due to the low levels of single-phase sources, no evidence has been noted of load imbalances attributable to

distribution energy resources." Although this response only addresses one of the potential sources of harm stated in the supporting documents, in fact, the Company did not provide any evidence that DER was currently causing any of the potential problems described in the proposal.

Q. DO SUBSTATION METERS HAVE THE ABILITY TO REDUCE, ELIMINATE, OR CONTROL ANY OF THE POTENTIAL HARM THAT THE COMPANY ASSERTS COULD BE CAUSED BY DER?

A. No, a substation meter has the ability to provide information about how the system is functioning on the circuit to which it is attached, and cannot directly resolve any of the effects such as load imbalances or harmonic issues. The purpose of these meters is to obtain information about potential system constraints so that solutions can be identified and implemented. The Company provided no evidence to suggest that the meters themselves could resolve any problems.

Q. THE COMPANY HAS ALSO ASSERTED THAT INSTALLATION OF SUBSTATION METERS WILL ALLOW FOR THE DEVELOPMENT OF A MORE PROGRESSIVE GRID. WHAT IS YOUR RESPONSE?

A. The Company did not clearly define what it meant by a more progressive grid, so I asked for additional clarification in a data request. According to the Company's response to OCS Data Request No. 8.1:

> The term "progressive grid" as used here is intended to convey the ability for the electric grid to operate effectively and efficiently as emerging technologies and communication networks become a more integrated component of the grid as compared to traditional electric systems. These technologies may include, but are not limited to, advanced metering, distributed generation, distribution automation, etc.

Basically, a progressive grid is one that integrates diverse energy resources and has a greater ability to respond to load changes, as opposed to a system that flows power from principle sources and possesses fewer tools to measure and control the current on the system. Although more advanced metering technology may be necessary in order to develop a "progressive grid," it is important to acknowledge that this asserted benefit is basically another description of the general benefit of the information made available by the installation of substation meters.

Q. WHAT IS THE POSITION OF THE OFFICE REGARDING THE PROPOSAL TO INCLUDE SUBSTATION METERS IN THE STEP PROGRAM?

A. The Office agrees that Advanced Substation Metering qualifies under the STEP legislation, particularly as an "electric grid related program" or "any other technology program" and therefore the proposal should be acknowledged and approved by the Commission. The Office also agrees that the data and information yielded by the installation of the proposed meters may help to identify potential sources of stress on the system.

The Office recognizes however, that no evidence yet exists that the system is being unduly stressed in the ways that the meters intend to verify, and that the proposed metering units in and of themselves do not possess the capability to resolve any such issues. If the Commission approves this substation metering proposal, the Office recommends that the Commission also order certain reporting requirements. At a minimum, these requirements should include:

1. Annual and final comprehensive program evaluation reports as outlined in the Company's STEP Reporting Plan.[1]
2. A final report of actual meter installation locations, including the reasoning for any deviations from the originally targeted locations.
3. Any and all determinations that can be made or inferred from the information provided by the meters, including harm that can be substantiated, as well as those harmful effects that cannot be substantiated, as they have been described in Exhibit "C" of the Application.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

[1] Rebuttal Testimony of Steven R. McDougal filed November 23, 2016 in Docket No. 16-035-36, Phase 1, Lines 246 – 304.