ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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September 2, 2020

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. 20-035-24**
In the Matter of the Formal Complaint of Scott Macdonald against Rocky Mountain Power
Response to Request for Supplemental Information

In accordance with the Order Denying Motion to Dismiss and for Supplemental Information issued by the Public Service Commission of Utah ("Commission") on August 5, 2020, in this docket, PacifiCorp ("the Company") respectfully submits its written response to the Commission's questions.

PSC Question 1:
Is there a quantitative standard by which RMP measures flicker, e.g. flicker frequency, flicker index, or flicker percentage? Is there a parameter or range of parameters for any such measurement that RMP considers to be acceptable or problematic?

Company Response to PSC Question 1:
Yes. Rocky Mountain Power refers to the Institute of Electrical and Electronics Engineers ("IEEE") 1453 standard, which is the utility standard for North America, to determine light flicker levels. IEEE 1453 defines an objective computation process for power quality manufacturers to implement in their flicker meters. Flicker meters determine the magnitude and the probability that light flicker would be perceived by the human eye through a statistical analysis of Root Mean Square ("RMS") voltage. The computation output of IEEE 1453 utilized by Rocky Mountain Power is the P_{st} - Flicker Perception, Short-Term. The P_{st} evaluates the amount of voltage fluctuations over a ten minute interval to calculate the probability that a human would observe light flicker in an incandescent 60 Watt bulb within those ten minutes.

Rocky Mountain Power considers light flicker to be problematic if the magnitude of P_{st} is above 1.0 for greater than 1% of a measuring period per Rocky Mountain Power's power quality standards 1C.5.1 *subsection 4.5.1 Statistical Guidelines.*

Table 1—Flicker Compatibility and Planning Levels

	Compatibility Levels	Planning Levels	
Voltage Level	LV & MV	MV	HV & EHV
P_{st}	1.0	0.9	0.8
P_{lt}	0.8	0.7	0.6

These limits are based off the IEEE 1453 standard. It should be noted, due to the human component of the evaluation, a small portion of customers will notice light flicker within IEEE 1453 limits.

PSC Question 2:
Has RMP performed any test or investigation to measure the flicker that Complainant alleges he is experiencing? If so, what were the results?

Company Response to PSC Question 2:
Yes. Efforts to identify the cause of the reported light flicker by the complainant began in 2019. A power quality monitor with IEEE 1453 flicker evaluation capabilities was set at the customer's home from October 24 – 31, 2019. The monitor determined that the P_{st} Flicker at the location of the service entrance was in excess of 1.0 for 51% of the readings. Compliance is determined by utilizing the ninety-nine percentile of the readings and the customer's home had a measured level of 1.75 P_{st}, -- well above the aforementioned 1.0 P_{st} recommended level. The source of the light flicker could not be attributed to sources behind the complainant's meter such as a poorly functioning equipment or large fluctuating loads.

Since then, the Company has been working diligently through the efforts described in the response to PSC question 4 to reduce flicker levels as reported by Complainant. In August 2020, an IEEE 1453 capable meter was once again installed near the Complainant's service location in order to measure the overall improvement of the flicker due to these efforts. The power quality monitor data showed the P_{st} flicker compliance level was 1.03 from August 14 – 20, 2020, a substantial improvement from the 2019 level of 1.75.

PSC Question 3:
RMP's Motion indicates it is "aware of increased flicker measurements on its distribution system in the vicinity of [Complainant's] home." Please provide the measurements to which RMP refers and explain their source.

Company Response to PSC Question 3:
Rocky Mountain Power has been monitoring flicker at a substation that is considered the point of common coupling for a large fluctuating load [redacted] in the area ("Large Customer"). Rocky Mountain Power has been working with the Large Customer to bring the amount of light flicker caused by their operations to within levels compliant with IEEE 1453. The flicker values have been recorded by a Nexus 1500 power quality monitor that determines P_{st} using the IEEE 1453 computation method (see figures 1 and 2.)

Figure 1 - P_{st} Level at Wheelon Substation

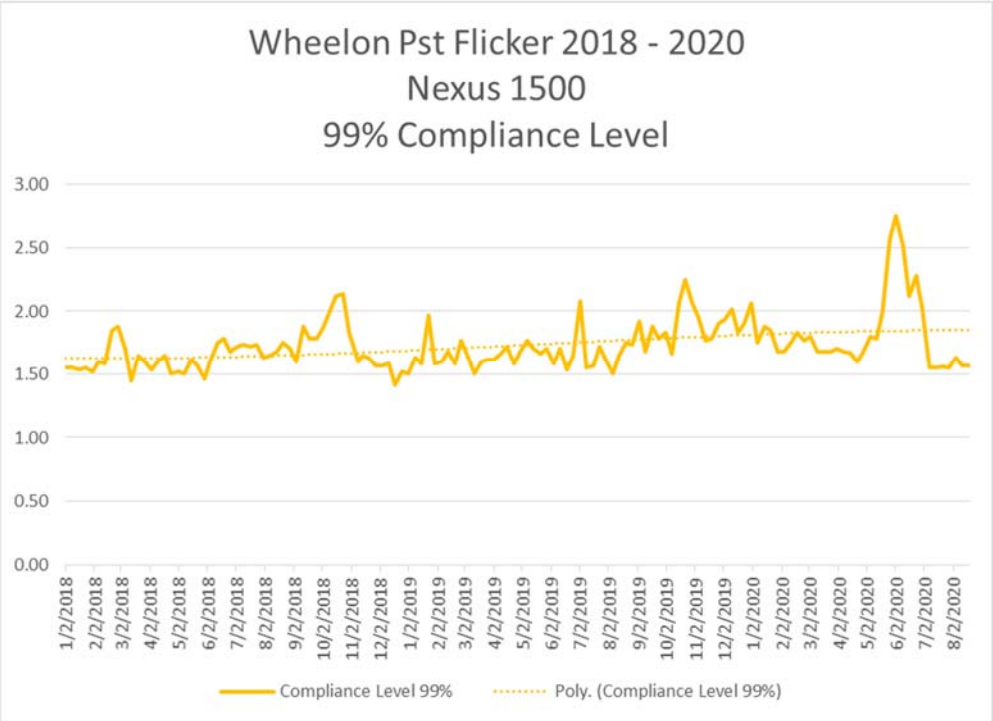
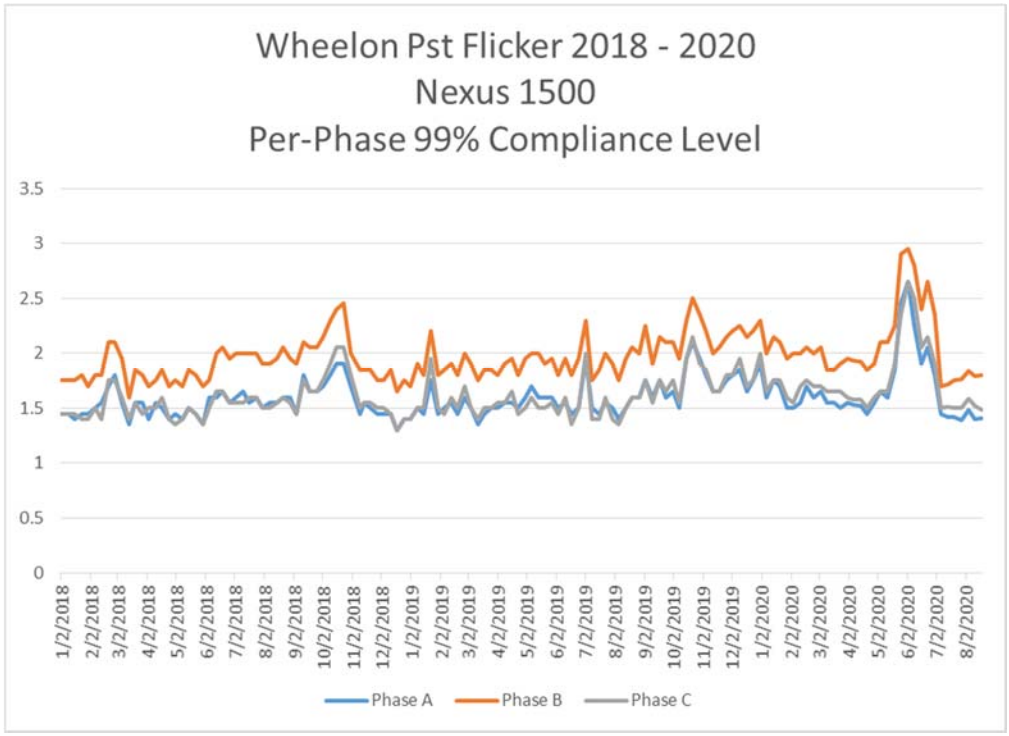


Figure 2 – Three Phase P_{st} Levels at Wheelon Substation



PSC Question 4:
As suggested in RMP's correspondence during the informal complaint process, has RMP identified another customer or party whose actions or equipment RMP believes is or is likely to be responsible for creating flicker issues in Complainant's area? If so, please explain what, if any, action RMP has taken to resolve the issue, including but not limited to communications with the identified customer or party.

Company Response to PSC Question 4:
Yes. The Large Customer in the vicinity of the Complainant's area has fluctuating load that has been identified as the primary cause of the elevated flicker levels. The source of the elevated flicker levels has been proven repeatedly by correlating the Large Customer's plant shutdowns with observed flicker measurements.

There has been extensive communication, including conference calls and in-person meetings and email between the Large Customer and Rocky Mountain Power, held for the sole purpose of improving the complainant's flicker levels. Rocky Mountain Power sent formal communications to the Large Customer requesting the customer provide Rocky Mountain Power a written strategy and timeline to bring down its flicker levels. A copy of that letter is provided as Attachment 1. A copy of the response from the Large Customer is also provided as Attachment 2.

In addition to working with the Large Customer on its flicker levels, power quality monitoring identified the P_{st} on Complainant's phase (B phase) to be 23% higher than the other phases. The Complainant was re-fed to the (A) phase in April 2020 in attempts to provide an immediate improvement.

Also, IEEE 1453 - 5.3 recognizes that the flicker evaluation method is not equivalent among lighting options due to the increased complexity and diversity of lighting manufacturers in their circuitry and product quality. Rocky Mountain Power tested multiple lighting options used in the area to identify whether the impact is exaggerated by the lighting devices commonly installed. Rocky Mountain Power identified that non-dimmable LEDs and LEDs manufactured by General Electric or Cree provided a reduced production of visible flicker. Prior to the formal commission complaint filing, the Complainant was informed that Rocky Mountain Power was working on lighting options. Other customers in the area who have expressed concern with flicker have been provided the alternate lighting information.

PSC Question 5:
Please explain RMP's position as to whether Electric Service Regulation No. 12(2)(e) and Electric Service Regulation No. 5(2)(e) pertain to the issues Complainant raises.

Company Response to PSC Question 5:
Electric Service Regulation No. 12(2)(e) and Electric Service Regulation No. 5(2)(e) are relevant to the issues Complainant raises to the extent that such provisions are reflective of Rocky Mountain Power's ultimate authority to deny service to a large industrial customer with high fluctuating loads, if improvements are not made, at customer's cost under Rule 12(2)(e). To date, Rocky Mountain Power does not believe that the flicker experienced by Complainant (which based on

recent measurements is now very close to IEEE recommended levels) reflects a situation where the high load customer has "seriously impair[ed] service," especially to the extent necessary to justify the installation of new equipment costing the Large Customer millions of dollars. Instead, as described in the response to PSC Question 4, Rocky Mountain Power has diligently pursued working with the Large Customer to bring flicker levels into an acceptable range through more economically efficient measures to manage use of loads through the Large Customer's operating practices.

PSC Question 6:
Does RMP maintain that no level or measure of flicker could be sufficiently severe as to render its residential service inadequate under Utah Code Ann. § 54-4-7 or other applicable law? If not, what level does RMP conclude is unacceptable and how would it be measured?

Company Response to PSC Question 6:
Rocky Mountain Power strives to maintain excellent service to all customers, and it recognizes that a level of flicker could be so severe as to make service inadequate under § 54-4-7. Along these lines, Rocky Mountain Power maintains that compliance with the IEEE recommended level would conclusively show that service is adequate. If the IEEE recommended flicker level is exceeded, this might show that service is inadequate, depending, however, on the circumstances of a particular issue. In the instant case, the Company does not believe the flicker level has been severe enough to make service inadequate under § 54-4-7. In circumstances such as these, Rocky Mountain Power is continuing efforts to work with its Large Customer to address the flicker issue. The Company believes this approach is consistent with the core mandate in Utah Code Ann. § 54-4-7.

Summary
The Company appreciates the opportunity to supplement the record in this matter and provide any additional information that the Commission finds helpful in this matter.

Sincerely,

Joelle Steward

cc: Scott MacDonald

CONFIDENTIAL

Attachment 1

THIS ATTACHMENT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

CONFIDENTIAL

Attachment 2

THIS ATTACHMENT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

CERTIFICATE OF SERVICE

Docket No. 20-035-24

I hereby certify that on September 2, 2020, a true and correct copy of the foregoing was served by electronic mail to the following:

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