

REDACTED



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February 17, 2021

***VIA ELECTRONIC FILING***

Utah Public Service Commission  
Heber M. Wells Building, 4<sup>th</sup> 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  
*Rocky Mountain Power's Status Report*

In accordance with the Notice of Electronic Status and Scheduling Conference and Request for Status Report issued by the Public Service Commission of Utah ("Commission") on November 18, 2020, in this docket, PacifiCorp ("the Company") respectfully submits its Status Report in this matter.

The Company notes that on December 6, 2020, Mr. Macdonald requested his electric account at the address<sup>1</sup> associated with this complaint ("Subject Property") be closed effective December 14, 2020 due to the fact that he had moved. The new resident of the home opened an electric account for service at the Subject Property on December 14, 2021, and the Company has not received any complaints from the new residents regarding electric service.

As previously noted, the amount of flicker experienced at the Subject Property is influenced by the large fluctuating load of Rocky Mountain Power's customer [REDACTED] ("Large Customer"). Although Mr. Macdonald and his household have moved from the Subject Property, the Company has continued and will continue to work with the Large Customer to address the flicker issues. The remainder of this report provides the information requested by the Commission.

**PSC Update Request 1:**

**Fully describe the results of its August 2020 testing and any subsequent testing, including the percentage of testing periods in which the P<sub>st</sub> levels exceeded 1.0**

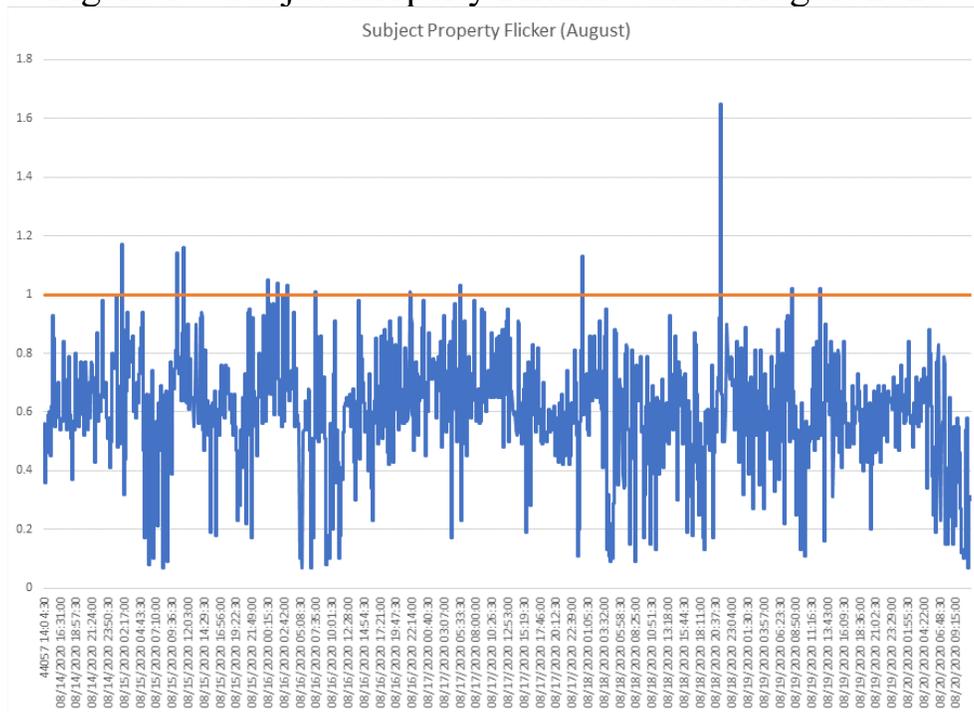
[REDACTED]

## Company Response to PSC Update Request 1:

### **August 2020 Monitoring and Reporting**

$P_{st}$  is defined as perceptible flicker in the short term (10-minute interval). Flicker is considered acceptable in IEEE methodology and PacifiCorp's standards if the maximum of the 10-minute interval values over 7 days is less than one, excluding the highest one percent of values. The reported value for a week is considered the weekly  $P_{st}$  value and is used to track the Large Customer's compliance with their contracted  $P_{st}$  values and analyze acceptable levels at the Subject Property. An Eagle 440 monitor was placed at the Subject Property from 08/14/2020 14:04 - 08/20/2020 11:28. The monitor recorded in standard 10-minute intervals to capture the 1.03  $P_{st}$  value at the property (see Figure 1).

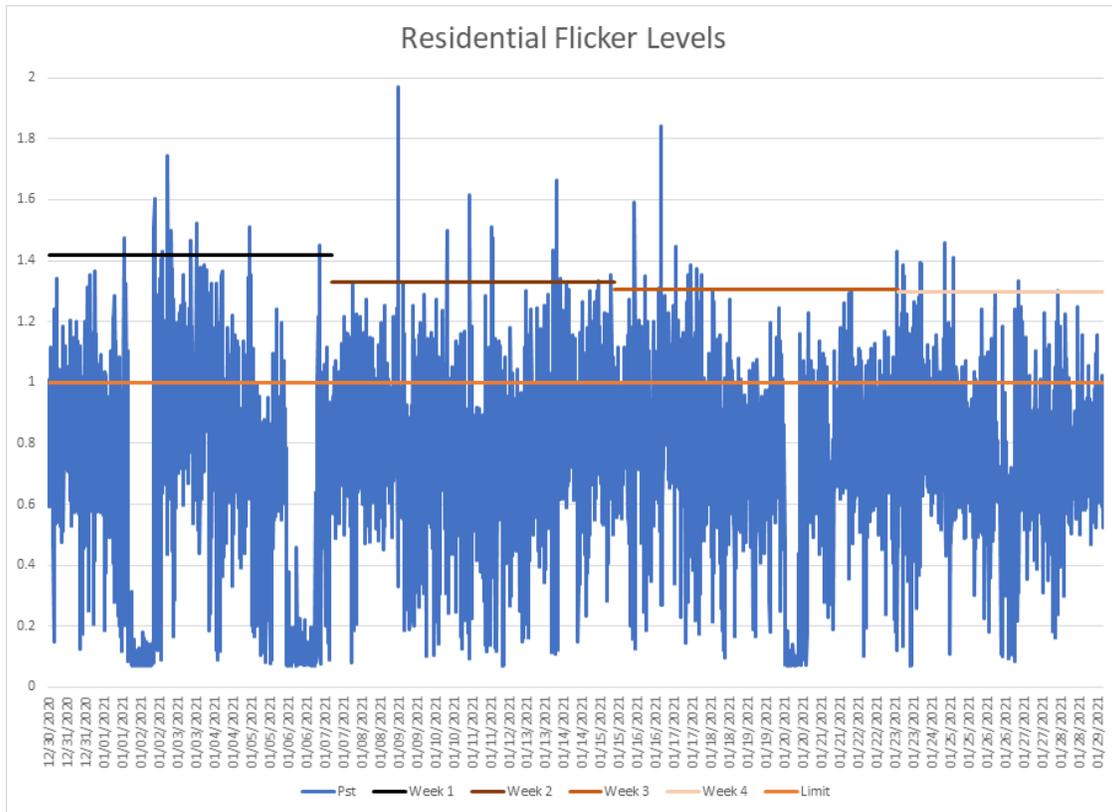
**Figure 1 – Subject Property Flicker Values August 2020**



### **January 2021 Monitoring and Reporting**

On December 30, 2020, a monitor was placed at the Subject Property. Over a 30-day period, the monitor recorded an average weekly flicker value of 1.35 (Figure 2), a 31% increase in  $P_{st}$  levels from the previously reported value in August 2020 of 1.03. The measured amounts from December 30, 2020 through January 29, 2021, exceeded the recommended IEEE standard of 1.0  $P_{st}$  for each weekly testing period.

Figure 2 - P<sub>st</sub> Level at Subject Property Monitor January 2021



**Recording History Overview**

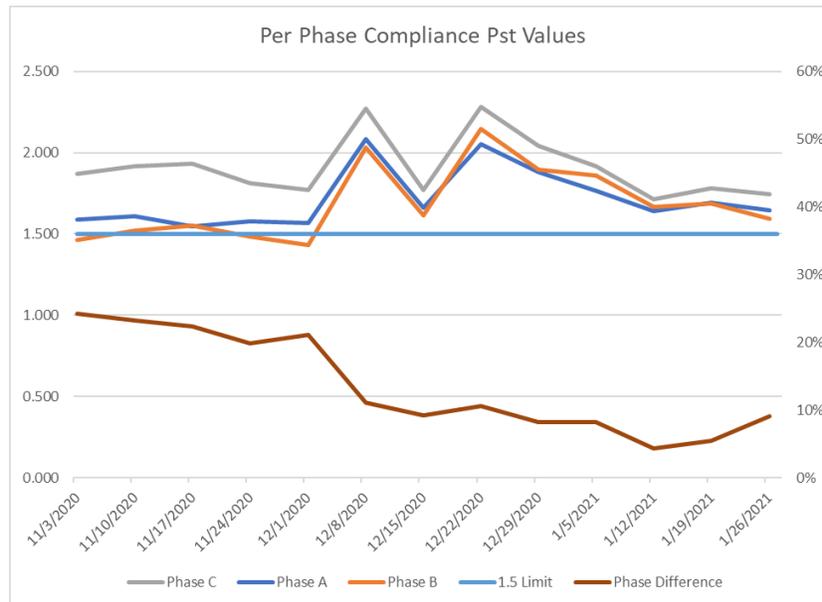
A monitor has been set at the Subject Property four times in total, as indicated in the color coding in the table below. (In addition to the two times discussed above, a monitor was set at the Subject Property on two separate occasions in 2019.) A summary of all recordings’ weekly P<sub>st</sub> values are listed in the table below. The percentage of intervals recorded greater than one are also included for each weekly recording.

Table 1 - P<sub>st</sub> Level at Subject Property History

Date	Weekly P <sub>st</sub> Value	% of Intervals above 1.0
7/16 – 7/23/2019	1.05	1.82
7/26 – 7/30/2019	1.36	17.75
10/24 – 11/01/2019	1.83	54.0
11/01 – 11/06/2019	1.57	23.18
08/14 – 08/20/2020	1.03	1.5
12/30 – 01/07/20	1.42	17.6
01/07 – 01/15/21	1.33	16.7
01/15 – 01/23/21	1.31	16.5
01/23 – 01/29/21	1.30	9.72

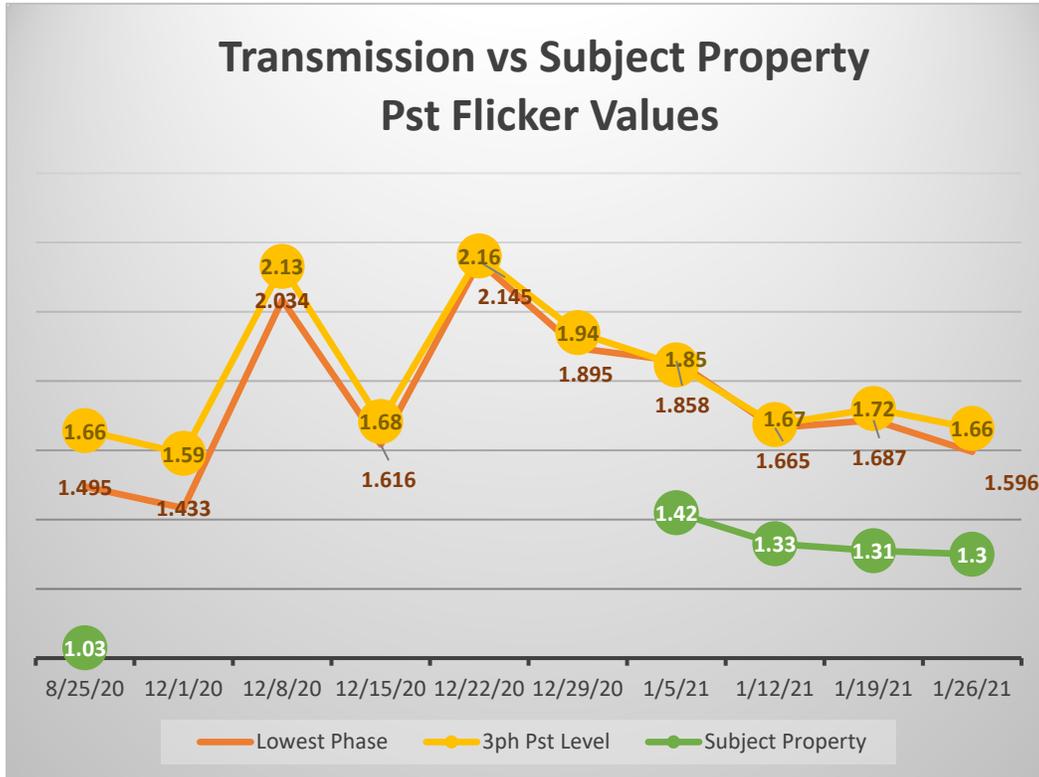
Two factors have been identified as contributors to the increase of  $P_{st}$  values observed in August 2020 compared to the recent values. First, the utility electrical system is made up of three wires, also known as phases (referred to as phases A, B and C). Prior to December 2020, the Company had consistently measured  $P_{st}$  values 23 percent higher on the highest phase over the other two phases as shown in Figure 3.

Figure 3 – Per Phase Transmission Flicker



The Subject Property was moved from the highest phase to the lowest phase on April 14, 2020. The exchange of phases alleviated the flicker at the Subject Property and contributed to the improved 1.03  $P_{st}$  level observed in the August 2020 measurement. However, recent changes in the Large Customer’s manufacturing process have reduced the amount of flicker on the elevated phase resulting in an average 6.8% difference between phases, compared to the previous average difference of 23%. The improvement for customers on the elevated phase was not extended to the other two phases however, and the two other phases have risen from 1.49 to 1.59 (see Figure 4). The Subject Property resides on the lowest of these other two phases. The Large Customer’s processes have recently changed such that the difference in flicker values between the phases has lessened, thus decreasing the effectiveness of changing the phases.

Figure 4 – Flicker Comparison of Transmission & Subject Property



The transmission weekly P<sub>st</sub> values (depicted in orange and yellow) are derived from a flicker monitor located at Wheelon substation near the Large Customer. This monitor measures the Large Customer’s P<sub>st</sub> levels. The composite flicker level at Wheelon substation attributable to the Large Customer’s fluctuating load is determined by finding the 99<sup>th</sup> percentile of each of three phases for a 7-day period, and the average of the three phase 99<sup>th</sup> percentile values is used to calculate the amount shown in yellow in figure 3. The darker orange trace reflects the flicker value of the phase shared with the Subject Property. The comparison of the Subject Property flicker values to the shared transmission phase demonstrates that the Subject Property flicker follows the lowest transmission phase opposed to the overall customer compliance evaluation.



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**PSC Update Request 2:**

**Describe any additional efforts RMP has made to remedy the problem and the results of such efforts**

Company Response to PSC Update Request 2:

The Company has made efforts to remedy the flicker problem at the Subject Property by changing the phases serving the Subject Property, coordinating with the Large Customer in the area and researching flicker resistant lighting options.

**Changing Phases**

As previously explained, in April 2020, the Company moved the Subject Property to the lowest phase to capitalize on the discrepancy in phase values, which provided an improvement in flicker. However, as noted, recent changes in the Large Customer’s processes have reduced the effectiveness of these efforts.

**Customer Coordination**

RMP continues to work with the Large Customer in attempts to reduce the flicker introduced into the system as a result of the Large Customer’s fluctuating load. In these last few months, efforts have been primarily focused on addressing a spike in measured flicker (shown in Figure 4),



On January 26, 2021, Rocky Mountain Power sent a letter to its Large Customer, a copy of which is attached as Confidential Appendix A. As requested in the letter, the Company met with its Large Customer on February 3, 2021 to discuss the next steps in the plan to address the flicker issue. The Large Customer informed the Company that it had updated a bid to replace some equipment, but due to the cost and lengthy time required to procure, it is exploring other options first. This equipment is discussed in further detail later in these comments.

**Flicker Resistant Lighting**

The Company performed a comprehensive light output analysis of multiple LED lights to identify brands and bulb characteristics that are flicker resistant. The Company is willing to work with individual customers to educate and distribute sample replacement bulbs that will mitigate the severity of flicker. Below are some of the key findings from the analysis.

**Flicker Resistant Characteristics**

- *Recessed LED Trims* – Fixtures designed to work exclusively with junction boxes lack the power conditioning circuits to ensure light quality
- *Non-dimmable LED* – Power conditioning is improved due to the lack of need to modulate light output
- *Decreased Light Output* – To retain energy savings brighter lights with the same footprint do not regulate voltage as effectively as flicker resistant LEDs
- *Multiple Elements* – LEDs with multiple diodes outperform single diode LEDs.
- *Flicker Resistant Brands* – GE, Halo (Specific models that will be readily available at local home improvement stores)

- *Bulb Types with Confirmed Flicker Resistance* – Standard, candelabra, recessed & surface mount

**PSC Update Request 3:**

**If testing continues to show Complainant’s flicker issue exceeds the IEEE standard, identify what actions RMP or its Large Customer would need to take to reliably and consistently bring Complainant’s service into compliance with the IEEE Standard, including estimates as to any associated costs and who RMP believes would be responsible for paying them**

Company Response to PSC Update Request 3:

As recent testing has shown the flicker levels to continue to exceed the IEEE standard, the Company believes the following actions would be necessary to reliably and consistently reduce the levels into compliance with the IEEE Standard.

1. Large Customer improvements: the Large Customer continues to experiment with process modifications in its efforts to reduce flicker caused by its large fluctuating load. It has also considered a substantial capital improvement in its electrical equipment, replacing its existing static var compensator (“SVC”) with an SVC Plus. This device switches capacitor banks in and out at a high rate of speed in order to levelize voltage at the plant. The Large Customer’s existing SVC provides substantial benefits, as demonstrated by observed higher  $P_{st}$  values when the SVC comes offline. However, its existing SVC may be undersized or inadequately designed for its current operations. The Company believes a newly designed and properly sized SVC would likely mitigate the flicker issue. [REDACTED]
2. Customer Experiencing flicker: the Company believes the most effective immediate relief would be through replacing the lighting in a customer’s residence who is experiencing flicker. These strategies can include both higher quality LED lightbulbs and higher quality lighting fixtures. The Company is willing to assist affected customers in implementing this option.
3. Rocky Mountain Power transmission network improvements: Improvements are planned to support the 138 kilovolt transmission network in the area, which will provide substantial voltage support to the Wheelon substation. While this project is not primarily intended to address the flicker issues in the area, an ancillary benefit of the project could be a reduction to the flicker levels. Additional voltage support would reduce the magnitude at which lights flicker but would not address the frequency at which they flicker. The Company plans to complete this project by the end of 2023.

**Summary**

The Company appreciates the opportunity to provide this status update to the Commission and is committed to provide any additional information the Commission finds helpful in this matter. Rocky Mountain Power is committed to continue working with its Large Customer and through the other measures discussed in these comments to resolve the flicker concerns.

Informal inquiries may be directed to Jana Saba at (801) 220-2823.

Sincerely,

A handwritten signature in blue ink that reads "Joelle Steward". The signature is written in a cursive, flowing style.

Joelle Steward  
Vice President, Regulation

cc: Scott Macdonald

**CERTIFICATE OF SERVICE**

Docket No. 20-035-24

I hereby certify that on February 17, 2021, a true and correct copy of the foregoing was served by electronic mail to the following:

Scott Macdonald [bones3mac@gmail.com](mailto:bones3mac@gmail.com)

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**Rocky Mountain Power**

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Mary Penfield  
Adviser, Regulatory Operations

# **Appendix A**

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