Richard E. Drake & 50 Petitioners
Concerned Ratepayers of Millcreek Township
2134 E. Lambourne Avenue
Salt Lake City, UT 84109
(801) 484-5130
Assigned Docket No. ~~06-035-20~~ 07-035-08

March 28,2007

Public Service Commission
Heber M. Wells State Office Building
160 E. 300 S. – 4th Floor
Box 45585
Salt Lake City, UT 84145

Dear Public Service Commission:

Please find attached our response to the Document submitted by PacifiCorp's attorney, which arrived at my home 40 some days following the complaint submitted on February 12,2007. Time is of essence in correcting the safety problems that persist with the electrical distribution system, despite efforts to obfuscate the facts.

Introduction

PacifiCorp's response appears to be either an attempt to confuse or deceive the Public Service Commission, or it demonstrates PacifiCorp's lack of understanding with regard to **the intent** of the N.E.S.C. (National Electrical Safety Code). Rocky Mountain Power's Exhibits A and B essentially supports assertions that failed insulator pins are a great risk for wet flashovers by short circuiting the critical underside of the insulators. The short circuit blows line fuses and cause outages in wet weather and during lightning storms. In some cases pole or cross arm fires are started. There have been three instances within the past few months of circuit breaker failure at the East Millcreek substation. When the line fuse or circuit breaker fails the line can burn and fall to the ground as a live wire [*National Electrical Safety Code*, Table 235-6, page 135,2002 ed.]

Exhibits C and D do not reflect standard construction used in Utah. These exhibits are for grounded steel pin construction. The old UP&L Co. system used wood insulator pins (during the 50's, 60's and early 70's) (with a pin life of 40 years). Wooden pins are abundant throughout the State. The random poles identified in the Millcreek area contain many failed insulator pin

supports that create unnecessary, and yet very real hazards to residents. There are hundreds of poles not photographed in the area that have failed insulator pin supports.

Relevant issues

The relevant issues in this complaint are:

1) State of Utah Statutes governing utilities.

2) The N.E.S.C. (*National Electrical Safety Code*)

3) Utah Power and Light Company wood pin construction standards from the 1950s to the early 70's. (Wood pins installed earlier than the 1940's most likely were replaced by UP& L Co., prior to the merger with PacifiCorp.)

4) The expected service life of wood pin construction.

5) The lack of routine and responsible inspection along with preventive maintenance.

6) The existing condition of Rocky Mountain Power's 7.2/15 kV lines

7) Correcting problems on Millcreek Circuit 12, while ignoring the same problems on Millcreek Circuit 13.

It appears that PacifiCorp failed to acknowledge the brown pin insulators used in the 1950's and 1960's, and the gray NEMA 55-3 insulators used in the late 1960's and 1970's that have different characteristics and dimension than the modern NEMA 55-3 class of insulators. Modern insulators are designed for larger wire and have a conductive glaze covering the top 25% of the insulator to reduce radio noise. These changes resulted in modern insulators being taller. While it is believed that actual measurements will show the insulators photographed do not have three inches of clearance, the REAL PROBLEM IS THAT ANY PIN INSULATOR RESTING ON A CROSS-ARM IS INDICATIVE OF A SERIOUS PROBLEM. THE PROBLEM IS LOSS OF CRITICAL MECHANICAL AND ELECTRICAL STRENGTH.

It is agreed that while pole and cross-arm fires may account for less than 2% of all outages, that number cannot be disregarded, just as an oil light on an engine cannot be ignored. It is believed that if the P.S.C. inspects PacifiCorp's records, they will show that the number of cross-arm fires is increasing. What is even more troubling, and creates even further danger is having a failed insulator pin lead to an insulator and wire becoming a "floater." Floaters occur when the pin holding the insulator breaks or is pulled out of the arm. Wood pins that fall through a cross-arm are no longer secured. These same failed pins are usually charred, burnt, and have lost strength.

A charred and burnt insulator pin can be broken by wind, snow, or the weight of the wire. No argument can be made that these conditions do not pose a real safety hazard.

Response to section 11. Background from Pacificorp's filing

The pole fires in the complaint were not caused by lightning, brush fires, vandalism or hardware contamination. These pole ignitions were the direct result of insulator failure caused by years of neglected maintenance on the wood pins supporting the insulator.

The conditions leading to pole fires stated in PacifiCorp's response support the complaint. UP & L Co's 7.2/12.5 kV distribution lines were designed and built with a wet flash-over voltage rating in excess of 30 kV. The wet-flash over rating of pin insulators comes from the design of the underside of the pin insulator (not shown in Rocky Mountain Power's Exhibit A). When an insulator rests on a cross arm (as explained in Rocky Mountain Power's exhibit B) this critical leakage and flash-over distance can be shorted out. When insulators are supported above the cross arm (as show in Rocky Mountain Power's Exhibit D), the top and side of the insulator can be contaminated and wet , yet the insulator supports line voltage without causing a cross arm fire. This is due to the leakage and flash-over distance built into the underside of the insulator. If the insulator is resting on the cross arm (as shown in Rocky Mountain Power's Exhibit B) critical leakage and flash-over distance on the underside of the insulator are shorted out. This shorting out of critical leakage and wet flash distance allows insulator failure, cross arm fires, and wires to literally burn down. An insulator resting on a cross arm also makes power lines more likely to flash over from lighting strikes elsewhere on the circuit. The sympathetic flash-over results in outages from blown fuses.

Response to Section III: Reasons for PacifiCorp's Filing

There is full agreement with PacifiCorp's statement from the N.E.S.C. that "three inches of clearance must be maintained between the cross arm of the pole and the mid-point of the conductor." During the time of interest, the insulators used by UP & L Co were standard for the industry, but are shorter than the current design. When maintained they provide an adequate and safe design. When supported by an insulator pin, as shown in Rocky Mountain Power's Exhibit D, the construction complies with the N.E.S.C. When these older insulators rest on a cross arm there may be a violation of the 3 inch clearance mandated by the N.E.S.C.

The argument as to whether squatters or floaters are a class A or class B hazards is beyond the pale. (When a pin supporting a pin insulator breaks, or is pulled out of the cross arm hole, the industry calls it a floater). Public Service Regulation and the N.E.S.C. are clear that **there is no 120 day grace period rule for safety hazards. They must be addressed immediately.** If PacifiCorp has allowed a hazard to exist for years, in violation of the spirit and intent of the N.E.S.C., and State Public Service Regulations; if PacifiCorp has allowed violations to continue due to a paucity of manpower and scheduling problems, the maximum fine needs to be levied. State statutes (pages 61 and 62) mandate this fine to be per day, per instance, per insulator pin.

The P.S.C. is required to follow State Public Service Regulations and to levy the fines as specified.

It is most interesting to read the report submitted by Williams Consulting, Inc. to the State of Utah Division of Public Utilities, on May 12,2004, on page 30 of 51, Section 3 where they state ". . . . **the condition of the network in Utah is generally in worse condition than Oregon due to a historical lack of maintenance in Utah compared to a State mandated maintenance program in Oregon. Moreover, the maintenance strategy proposed in the Resource Review (the "51M" Plan on page 9) will not improve the average condition of the network and is unlikely to do better than sustain present outage performance."**

For the P.S.C. and Division of Public Utilities to ignore State mandated Service Regulations and safety hazards constitutes a dereliction of duty. The P.S.C. must enforce all existing tariffs. PacifiCorp must comply will all existing tariffs. All existing tariff agreements must be met before any new rate tariff can be granted.

The P.S.C. can quickly resolve all issues as to whether a hazard exists. The actual cross arms, that were photographed, provide clear and irrefutable evidence of N.E.S.C. violations. The P.S.C. by executive order needs to take into custody the cross arms, insulator pin supports, and insulators as they are removed from service by Rocky Mountain Power line crews. Using the actual cross arms, pins, and insulators the P.S.C. can quickly and accurately measure wire height above cross arms, the strength of the charred pins, and ascertain the exact level of risk to the public. If there is less than three inches of line clearance (N.E.S.C., table 235-6) or an insulator supported by a charred wood pin breaks at less than 700 pounds (N.E.S.C. Rule 261F) a safety hazard exists. If a safety hazard exists, the P.S.C. IS REQUIRED TO START LEVYING THE FINES MANDATED UNDER "UTAH PUBLIC UTILITY STATUTE 54-7-25 until the hazard is mitigated. If no safety hazard exists, then Rocky Mountain Power can schedule maintenance and the complaint will be resolved.

Cross Arm Removed From 3003 East Craig Drive:

A cross arm removed form 3003 East Craig Drive on the evening of March 27,2007, was on a 7.2 kV (7,200 volt) single phase distribution line. The cross arm shows the effects from having a single failed insulator pin . The cross arm was burned by the leakage current from a single 7.2kv phase wire. The method used to replace the arm destroyed evidence of how secure the phase insulator was attached to the arm. If this arm was not replaced there was a danger of the 7.2 kV phase wire falling into a row of parked cars and having someone touch one of the vehicles.

Due to the destruction of the evidence on the arm at 3003 East Craig Drive, it will be necessary to remove a second cross arm for the P.S.C. to inspect. **The cross arm, insulator pins and insulators at 2447 Fisher Lane need be removed as one piece.** It is possible to remove this cross arm at this location without disassembling it. This pole is a 12.5 kV (12,500 volt) three phase structure. **This pole has three failed wood pins and no neutral wire on the arm** . The charring and burning is due to the 12.5 kV voltage stress across the wood pins and arm. On this pole there is no neutral or ground wire on the cross arm to collect the leakage current. On this type of structure burning and charring or the wood insulator pin should be evident. **This pole is extremely hazardous.**

The **petitioner's request of the P.S.C. that they take possession of the cross arm at 2447 Fisher Lane** (Fisher Lane Photo's 9 & 10 provided in the complaint). The pole is across from Rosecrest School and behind a home in which the Greek resident complained she has been afflicted with multiple outages over the past few months and years (Interview with plaintiff on March 27,2007).

Exhibit A as submitted by PacifiCorp

The text on Exhibit A is correct. The drawing does not show the critical underside leakage distance that is designed to remain dry when the contaminants on the top and side of the insulator becomes wet. It is this critical dry underside insulation that prevents pole fires. This critical underside insulation is what is short circuited when a failed wood insulator support pin fails and the insulator falls to the cross arm as photographed by Richard E. Drake. Pole fires are the result of the dry underside insulation being short circuited by having an insulator fall to the cross arm.

Exhibit B as submitted bv PacifiCorp

The text on Exhibit B is correct. This drawing accurately shows what happens when an insulator rests on the top of a cross arm. Critical underside leakage distance is short circuited when the top and sides of the insulator become wet. It is this critical dry underside insulation that prevents pole fires. This critical underside insulation is what is short circuited when a failed wood insulator support allows the insulator to fall to the cross arm. Many failed pins were photographed by Richard E. Drake. Pole fires are the result of the dry underside insulation being short circuited by having an insulator fall to the cross arm**.**

Exhibit C as submitted bv PacifiCorp

Exhibit C depicts grounded steel insulator pin construction. Steel insulator pin insulator support were not widely used in Utah until after the mid-1970s and were not grounded. (This change to steel insulator supports was implemented because of the high maintenance cost of wood insulator pins). The few steel insulator pins used before the mid-1 970s were not grounded. Current Rocky Mountain Power steel insulator pin construction is not grounded. Normally the only ground wire installed on the surface of Utah Power and Light Company, Utah Power, and Rocky Mountain

Power cross arms was and is a ground wire to the neutral wire. This drawing is only relevant to show how a pin type insulator needs to be installed with the clearance required by the N.E.S.C. The safety violations cited by Richard E. Drake and 50 petitioners (Docket No. 06-035-20) are specific to wood insulator pin construction used by Utah Power & Light Co, prior to the mid 1970s and the blatant lack of maintenance by PacifiCorp. **The introduction of ground wires in this exhibit allows Docket 06-035-20 to be expanded to the safety hazards caused by improper grounding of the neutral wire due to pole ground wires being cut by misguided power company personnel (See Exhibit F of this document).**

Any wire attached to a wood cross arm of a high voltage line will collect insulator leakage current as shown in Pacificorp's Exhibit C. The pole ground wire carries the current safely to earth. If this pole ground wire is cut and not repaired, voltage appears across the gap in the wire. A failed insulator support allows an insulator to rest on the cross arm, increasing leakage current and voltage across the gap in the pole ground wire. **The complaint is now being amended to require P.S.C. to order Rocky Mountain Power to inspect ground wires and repair where cut.** Cut pole ground wires can cause a dangerous voltage to appear across the gap in the wire. Cut pole ground wires increase the voltage surge seen in customer's branch circuit wiring (wires within a home or business). Cut pole ground wires can result in damage to customer equipment. The P.S.C. should order Rocky Mountain Power to review past damage claims for the repercussions caused by cut pole ground wires. (See picture of pole with cut ground wire on corner of 23rd East and Fisher Lane (Southwest corner of 23rd and Fisher Lane - Exhibit E of petitioners response). This hazard needs to be promptly addressed.

Exhibit D as submitted by PacifiCorp

Exhibit D shows steel insulator pin construction which is not relevant to the complaint. The safety violations are on wood insulator pin construction. The introduction of any steel insulator pin construction drawing is either an attempt to confuse or deceive the Commission, or it shows PacifiCorp's lack of understanding of the National Electrical Safety Code issues. The only standards relevant are Utah Power & Light Co's wood pin-construction standards from the 50's, 60's and early 70's. It is these lines, built during the 1950's and 1960's that have not been properly maintained or upgraded. They have now exceeded their approximate 40 year safe-life. The unmaintained wood insulator pin, used to support power lines presents a safety hazard for the public.

PacifiCorp ignored the charge that with time the integrity of a wood pin, insulator support is diminished. When a wood pin, insulator support falls through a cross arm, it is an indication that the strength of the wood pin is compromised. The strength requirement for wood pins is detailed in Section 261F of the N.E.S.C. The mechanism of failure was described in the sketch attached to the complaint. Insulator leakage current erodes and weakens wood pins. When the nail holding the wood pin in the cross arm erodes and the pin falls through a cross arm, the wood pin may be ready to break. The longer the warning is ignored, the more likely the pin will break allowing the wire and insulator to break loose. Failure to recognize this problem, without pro-active

inspections is worse than failure to respond to an idiot light on an automobile signaling that the oil is dangerously low. A floater (the term used in the industry to describe a broken wood or a wood pin pulled out of a cross arm) can be caused by wind, snow, ice, or the weight of the wire. Once an insulator pin falls through a cross arm**,** it is no longer secure, and it can be pulled free. Wood pin supports for insulators have a functional life. If they are not replaced when they fall through a cross arm they will continue to char and will break. A squatter is a hazard, but floaters represent an extreme hazard. The minimum strength requirement for insulator pins are detailed in Section 261F of the N.E.S.C.

The cost of neglected maintenance and any fines levied are the responsibility of PacifiCorp management and its share holders (now Mid America). Utah rates included a cost for maintenance. For decades rate payers in Utah have paid for maintenance that PacifiCorp never performed. The cost of back maintenance is the responsibility of PacifiCorp management and its share holders. Rate payers should not be forced to pay again for maintenance not done.

Ineffectual regulatory bodies

An investigation needs to be done immediately in order to ascertain how maintenance dollars are and were allocated, and if any diversion of maintenance funds to PacifiCorp's un-regulated enterprises occurred. It is public record and public information that PacifiCorp spent a disproportionate amount of Scottish Power's maintenance money in Oregon where **Oregon's P.S.C. levies fines in contrast to Utah's P.S.C. and the Division of Public Utilities who have allowed the Power Company to run slipshod over Utahns.** This neglect and abuse is clearly compounded when one realizes that PacifiCorp's operation is significantly smaller in Oregon than the distribution of electricity to Utah. Oregon is projected to receive 6 million dollars for maintenance in 2007 in contrast to Utah receiving 2.1 million. This foregoing fact is a public record published in Williams Consulting Inc. *Report to Utah State 's Division of Public Utilities*, dated May 12, 2004, page 16 of section 5. **Why the inverse relationship?** What does it say about Utah? **What does it say about Utah political appointees who have the mandate to implement State Statutes relative to the regulation of public utilities?** It's time to bite the bullet and stop engaging in the never ending paper shuffling bureaucracy that so frequently renders regulatory bodies ineffectual in representing the outstanding residents of Utah.

Rocky Mountain Powers (PacifiCorp's) response and Exhibits are farcical and support arguments made by others that PacifiCorp no longer has the knowledgeable, competent management and engineering, and no longer has the linemen and service personnel to maintain the Rocky Mountain Power distribution system in the State of Utah. It is critical that fines be levied. The fines levied would provide support and funding for State regulatory agencies to review all past P.S.C. directives involving PacifiCorp and to fund the inspection of all Utah Power lines and equipment in order to bring them into safe operating condition, in compliance with N.E.S.C. standards and in compliance with past P.S.C. directive and Public Service Regulations. The cost of compliance is not a rate payer responsibility especially when the decisions to divert maintenance dollars and reduce maintenance services were made by PacifiCorp management in

Portland, Oregon. The 6 million dollar maintenance budget for Oregon in contrast to 2.1 million for Utah is abysmal, especially when the bulk of the electrical distribution system is in Utah.

Requested relief - remedies

The relief requested by the PETITIONERS is:

1) An immediate inspection be made of East Millcreek Circuit #13 listing all required maintenance and repairs.

2) Complete all repairs and maintenance by December 3 1,2007.

3) Levy fines for each safety violation until corrected (Utah Public Utility Statute 54-7-25).

4) The PSC procure for personal examination the cross arms **as** taken down where N.E.S.C. violations have been present, whether it be failed insulators, failed insulator pins, improper grounding et. cetera. No evidence is to be destroyed in the afore-mentioned process.

5) Issue a mandate that Rocky Mountain Power no longer be subordinate to PacifiCorp, but report directly to Mid-America. Mandate that a certain percentage of their revenue be directly applied to maintenance and repair of the distribution system.

6) With regard to Reliability and Maintenance of electrical distribution, implement the recommendations made by William Consulting Inc. in their *Report to the Division of Public Utilities* (page 5 of 51, section 3) wherein they called for:

   a) Conducting a maintenance plan audit to determine whether the Company is performing all inspections, testing, preventing and corrective maintenance as required by law.

   b) Modifying and expanding the maintenance priority codes and schedules to specify the types of conditions requiring immediate corrective action, within one month, six months, and one year.

   c) Instituting a rigorous program to prioritize, schedule and track corrective maintenance for both "A" and "B" (and expanded codes as above) maintenance items.

   d) Performing a physical inspection of a sample of the distribution system including conductors and ancillary equipment, poles and all attachments, cross-arms,

protective devices, lightening protection, transformers, switches, regulators, substations and right-of- way conditions.

e) Providing suitable increases in baseline maintenance budgets and resources in order to keep up with corrective maintenance work order such that system reliability improves. This item would involve two distinct and significant activities:

i. Evaluating baseline maintenance budgets to properly support corrective maintenance and system reliability targets

..

ii. Assessing resource requirements based on the work plan to provide adequate resources (contracted and internal) to support the plan.

f) Mounting a "catch-up" maintenance program in order to substantially reduce the outstanding corrective maintenance items within a short time period and with a view to improving system reliability, particularly SAIFI. Further, the Company should jointly with the DPU, determine a reasonable and measurable target for frequency as an expected outcome of increased maintenance spending.

g) Performing an annual review and comparison of PacifiCorp's Utah reliability metrics against itself, PacifiCorp other than Utah, and an industry benchmark panel.

7) Commit to reestablishing the integrity of the electrical distribution system in Utah.

Summary

It doesn't reflect well upon the PSC that Utah is almost dead last with regard to maintenance spending per customer. (See exhibit A)

It doesn't reflect well upon the PSC that Utah is almost dead last when it comes to the reliability of its distribution system, (See exhibits B & C)

It doesn't reflect well upon the PSC that Utah is getting about 2.1 million dollars for maintenance in the year 2007, while Oregon is getting 6 million dollars. This is especially troublesome considering the fact that the bulk of PacifiCorps operation is in Utah.

It doesn't reflect well upon the PSC that PacifiCorp's analysis to determine staffing needs has not been clearly articulated, nor that comparative industry staffing benchmarks have been established, or that employees over the past 10 years have declined 40-50% while customers

increased 3 1%, all of which places in doubt the ability to accomplish maintenance work load (See exhibit D).

It doesn't reflect well upon PacifiCorp's that pole # 274710 has over one foot of ground wire missing, thus rendering the ground totally impotent, carelessly posing an unnecessary hazard. This pole is at the comer of 23rd E. And Fisher Lane - S.E. quadrant) by the home formerly owned by the Sorenson family. (See exhibit E) Its fair to estimate that there are many such poles in Utah that need to be sought out, and the problem(s) corrected.

We as petitioners simply ask that the PSC do its job, and conscientiously advocate for the safety and well-being of the consumer, the rate-payer, the stand-up-tall Utahn who deserves productive goal-directed action, in contrast to bureaucratic morass, political agendas, and posturing. Bull-dogging by the utility should never undermine the mandate and responsibility of the Utility Over-sight Committees of the State of Utah.

Respectfully,

Concerned rate payers and petitioners
Richard E. Drake and 50 others
2134 E. Lambourne Avenue
Salt Lake City, UT 84109
(801) 484-5130