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Memorandum

TO: Public Service Commission

FROM: Division of Public Utilities
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DATE: February 23, 2005

SUBJECT: Advice Filing 04-13 – Docket No. 98-2035-04 – Rule 25 – Customer Guarantees and Schedule 300 – Regulation Charges

ISSUE

On December 2, 2004, PacifiCorp (Company) filed an Advice Filing 04-13 –Docket No. 98-2035-04 proposing some revisions to Electric Service Regulation 25 and Schedule 300 upon the expiration of the Company's five-year merger commitment on March 31, 2005. Specifically, the Company proposes several changes to its customer guarantees, network performance standards, and customer service performance standards. Additionally, the Company proposes a change in the definition of a Major Event. Finally, the Company proposes a three-year term for the modified program with an effective date of April 1, 2005. The Division of Public Utilities was asked to investigate and review Tariff compliance and report its recommendations by March 25, 2005.

RECOMMENDATION

The Division of Public Utilities recommends that the Commission approve, with the modifications specified below, the Advice Filing 04-13, – Docket No. 98-2035-04 – Rule 25 – Customer Guarantees and Schedule 300 – Regulation Charges, with an effective date of April 1, 2005. In summary, the Division recommends the following changes to the Company's proposal:

1) On page 8 of the filing, the language should be changed to reflect that the Company will respond to 100% of Commission complaints within thirty days.
2) The language used in NPS4 should be expanded to read "the Company will continue to select a maximum of five under-performing circuits in Utah on an annual basis and it will undertake corrective measures to reduce the circuit performance indicator (CPI) within two years. After no more than an additional three years, the Company will measure the current CPI score for its targeted 20% improvement….."
3) In relation to CS3, The Company should track the number of customers whose power was disconnected for non-payment and the length of time it takes to switch their power back on. The Division recommends that the Company report this information to the Commission on an annual basis.
4) Regarding CG7, The Division recommends that the Company continue to provide two working days notice for planned interruptions. The Division also recommends that the Company collect data on the number of business customers affected by planned interruptions and length of notice time provided. This information should be reported to the Commission annually.
5) The Division recommends that the Company continue providing Quarterly reports on the Customer Service Commitments to the Commission.

DISCUSSION

In Bob Moir's direct testimony of Docket No. 98-2035-04, the Company agreed to implement seven Performance Standards and eight Customer Guarantees[1] for five years beginning February 29, 2000 and ending March 31, 2005. The Performance Standards describe what the customers can expect in terms of overall level of service provided by the Company. The Customer Guarantees are the Company's guarantees to individual customers regarding the quality of their interaction with the Company. The purpose of these merger commitments was to improve service to customers and to emphasize to Company employees that customer service is a top priority. These Service Standards or merger commitments will expire on March 31, 2005.

In this filing, the Company proposes a continuation of both the Performance Standards and the Customer Guarantees with some modifications. The proposed modifications, other than a change in the Major Event Definition, are as follows.

Customer Guarantee 1. Restoring Supply After an Outage: The Company proposes to continue this guarantee with no changes.

Customer Guarantee 2. Appointments: The Company proposes to schedule customers' appointments within a two-hour time frame. Previously, the Company offered customers morning (8:00 A.M. to 1:00 P.M.) appointments or afternoon (1:00 P.M. to 5:00 P.M.) appointments. The proposed change to this guarantee will reduce the length of time customers have to wait for their appointments. Hence, the Division believes that the proposed time frame for appointments is an improvement to this guarantee and recommends the Commission's approval.

[1] See attachment A.

Customer Guarantee 3. Switching on the Customer's Power: There are two proposed changes to this guarantee. First, the Company proposes to explicitly exclude guarantee payments for failure to switch on power within 24 hours if the customer was disconnected for non-payment, subterfuge or theft/diversion of service. However, the Company will continue to make every reasonable effort to switch on power for these customers within 24 hours after payment is received or arrangements are made for payments. Second, the Company also proposes a flat $50 guarantee payment for failure to switch power on within twenty-four hours for new customers. This replaces the current compounding of $25 every 12 hours beyond 24 hours.

With regard to the exclusion provision, on page 4 of the filing and in a meeting with the Commission, Division, Committee, and other parties, the Company indicated that it has voluntarily made guarantee payments to customers whose power had been disconnected for non-payment. The Company sees no reasonable justification to continue voluntary payments to customers who are not paying their bills. In its response to the Division's data request, the Company indicated that about 40% of Customer Guarantee 3 payments were paid out to customers who were disconnected for non-payment. The Division does not oppose this change, but because 40% represents a significant portion of total terminations, the Division recommends that the Company track the number of customers in this category and the length of time it takes to switch their power on and report this information to the Commission annually

With regard to the payment schedule, based on its experience in administering this guarantee, the Company claims that most of the customers who have received payments for failures under this guarantee have not been inconvenienced or economically impacted by a failure to switch on power within 24 hours. According to the Company, it is common for a customer to request to have power switched on by a given date, but that customer may not actually occupy the site until days after the switch on date, so there is no significant impact to customers if the power is not switched on within 24 hours.

Additionally, of the 12 utilities that the Company surveyed[2], only four are providing any type of guarantee on service activation. Each of these four utilities pays a flat fee averaging $40 per incident.

In a response to the Division's data request, the Company stated that it paid out a total of $10,075 for failures of this guarantee in FY2004. If the compounding feature of the payment were eliminated, the payment would have been $5,000. The Division notes that the Company switched on power within the guaranteed 24 hours 99.7% of the time (Company's FY2004 annual report on performance). The Division concludes that the proposed change appears to simplify the administration of this guarantee and is more in line with industry practices. Furthermore, the Division believes the reduction in the amount of money towards failure of this guarantee ($5075) is relatively small that the individual economic impact of this proposed change is minimal. Therefore, the Division recommends the Commission approve the proposed changes for this guarantee with the noted reporting requirements.

Customer Guarantee 4. Estimates for Providing a New Supply: The Company proposes a change to simplify the administration of this Customer Guarantee. Under the new proposal, the Company will provide a written estimate to customers within 15 working days after the initial meeting with the customer. Currently, the guarantee requires the Company to contact the customer within two working days to set an appointment and to provide a preliminary estimate within five working days assuming that alterations to the Company's network is not needed. Although the Company indicates it will maintain an internal target to contact customers within two working days

[2] See Attachment B for summary of the Company's survey. In May 2004, the Company identified the US utilities that are offering customer guarantees by reviewing Edison Electric Institute's catalog. The Company then obtained information about these utilities' customer guarantees, which were then compiled into a comparison summary.

to set an appointment, no other utilities surveyed guarantees this kind of timeframe for estimating new power supply.

By reviewing the Company's FY2004 annual report, the Division noted that the Company made more payments under Customer Guarantee 4 than any of the other guarantees (accounting 95.7% in FY03 and 97.7% in FY2004). The problem, in part, arises because this guarantee depends upon a sequence of activities, each to be performed in a timely manner. The structure of this guarantee contributes to the likelihood of guarantee failure. Hence, it is the Division's belief that the proposed change will simplify the administration of this guarantee and recommends the Commission to approve it.

Customer Guarantee 5. Response to Bill Inquiries: The Company proposes to continue this guarantee with no changes.

Customer Guarantee 6. Resolving Meter Problems: The Company proposes to reverse the time it takes to investigate reported problems or to conduct meter tests and report back to the customer from 15 days to 10 days. Given that there were only 15 failures in FY03 and 10 failures in FY04 (Company's FY2004 annual report on performance) for this guarantee, one could reasonably expect that the proposed improvement for this guarantee is achievable. The Division recommends the Commission approve the proposed changes.

Customer Guarantee 7. Planned Interruptions: The Company proposes to change the customer notification time for planned interruptions from two working days to two calendar days. In his Direct Testimony in Docket No. 98-2035-04, Bob Moir wrote

> "*Planned Interruption:* If we need to turn the customer's power supply off for planned maintenance work or testing, we will give the customer at least two days notice."

In interpreting the above quotation, the Company has been providing two working days. To gain some flexibility in scheduling employees, the Company proposes the aforementioned change to this guarantee.

The Division, however, is concerned that two calendar days notice may not give business customers enough time to make the necessary arrangements in employee or production curtailments. In response to a Division data request, the Company indicated that, when businesses are involved in a planned interruption, it usually provides more than the minimum 2-day notice so that businesses can plan accordingly. According to the Company's data response, it is the Company's regular practice to offer business owners the opportunity to reschedule a planned interruption provided that the business reimburses the Company for any overtime costs incurred. The Company further indicated that it "does not track the planned interruption records by customer types that are affected (residential, vs. business)". Although the Division commends the Company's efforts in working with businesses, the Division believes that there is a need for more objective data regarding the number of businesses affected by the planned interruption and the length of notice time per interruption before any changes are made to this guarantee. Therefore, the Division recommends that the Company continue to provide two working days notice for the life of the proposed modified program. The Division also recommends that the Company collect data on the number of business customers affected and length of notice time provided each business, and report this information to the Commission annually.

Customer Guarantee 8. Power Quality Complaint: Because there have been few power quality complaints (46 during FY03 and 204 during FY04) according to the Company's FY2004 annual report on performance and the Company met this guarantee's requirements 100% of the time, the Company proposes eliminating this guarantee. The Company proposes that any power quality complaints can be handled through the Commission's complaint system and the Company will respond to any complaint within

three working days. The Division believes that this suggestion is reasonable and recommends that the Commission approve the proposed elimination of this guarantee.

Network Performance Standards

In relation to Network Performance Standards (NPS) 1 and 2, the Company proposes to improve the SAIDI and SAIFI results by 6% to 207 minutes and 2.08 events, respectively within the three-year term of the modified program. Regarding NPS 4, the Company stated in its filing that "the Company will continue to select a maximum of five under-performing circuits in Utah on an annual basis and will undertake corrective measures to reduce the circuit performance indicator (CPI) by 20% within two years. The Company will expand the event inclusions to consider transmission and local transmission outages events, as well events that meet the criteria of the IEEE major event definition." The Division believes that the inclusion of the transmission events represents an improvement to the standard. However, the language for this guarantee should be expanded to read as

> *The Company will continue to select a maximum of five under-performing circuits in Utah on an annual basis and will undertake corrective measures to reduce the circuit performance indicator (CPI) within two years. After no more than an additional three years after the two years, the Company will measure the current CPI score for its targeted 20% improvement…..*

The Company proposes to keep NPS 5 (Restoring Power Outage) unchanged. However, the Company proposes an elimination of NPS 3 (related to MAIFI). The Company believes that the current method of measuring this index (breaker counts) does not provide an accurate measurement of MAIFI. To obtain an accurate measurement of MAIFI would require the addition of momentary detection capability to each circuit, which is a very expensive proposition. Hence the Company proposes to eliminate this standard. The Division sees no reason to oppose the Company's recommendations.

Customer Performance Standards

The Company will retain both Customer Service Performance Standards (CSPS 1 and 2), but proposes changes to both standards. Regarding the standard for telephone performance (CSPS1), the Company proposes that the service level for telephone response be reduced from 80% of calls answered in 20 seconds to 80% of calls answered in 30 seconds. The Company argues that the current standard may actually compromise service quality, because in trying to answer the telephone in a timely manner, customer representatives may put some customers on hold. To avoid this potential problem, the Division thinks the proposed change is reasonable when coupled with a focus on the quality of service that the customer receives. In its filing and in a meeting with the Commission, Division, and Committee, the Company stated that it will monitor customer satisfaction with the Company's Customer Service Associates and the quality of response they receive.

Regarding CSPS2, the Company's proposed change is to include a 95% completion target to the Company's target response to non-disconnect and disconnect complaints. That is, the Company proposes to respond to non-disconnect Commission complaints within 3 working days at least 95% of the time, respond to disconnect Commission complaints within four business hours at least 95% of the time, and resolve Commission complaints within 30 days at least 95% of the time. Rule R745-200-7 requires that the Utility resolve 100% of the Commission complaints within 30 days. The Division recommends that the Company make the appropriate change to the filing to comply with this rule.

Major Event Definition

Besides the Customer Guarantees and the Performance Standards, the Company also proposes changes in the General Exceptions. Specifically, the Company is proposing to change the definition of Major Event to match the IEEE 1366-2003 definition. The IEEE 1366-2003 defines Major Event as "*an event that exceeds reasonable design and or*

operational limits of the electric power system. A Major Event includes at least one Major Event Day". IEEE 1366-2003 defines a Major Event Day as "*a day in which the system SAIDI exceeded a threshold value, T_{MED}."* A Major event Day is simply a day in which the reliability of the distribution system is much worse than normal.

Currently, different utilities define Major Event differently and use different data collection methods. According to IEEE, this lack of consistency makes it difficult to compare indices between utilities (even if the customers served by these utilities have the same reliability experience) and to develop meaningful trending and service quality targets. Consequently, the IEEE Working Group on System Design (Working Group) tried to develop a methodology that will yield better comparability and target setting. The Working Group established criteria that the method should meet: 1) be fair to all utilities regardless of size, 2) allow segmentation of reliability data into normal and abnormal categories, based on the identification of outlier events that cause Major Event Days, 3) allow use of normalized indices for internal and external goal setting, 4) be consistent for various amounts of data availability and for all utilities, and 5) be easy to understand and execute. The Working Group selected the 2.5 Beta Method (described below) as the method that best meets these criteria.

Two and One-Half Beta Method

In an attempt to determine the most objective method, the Working Group obtained and exhaustively analyzed reliability data from 37 utilities. The Working Group found that the reliability data, in this case the daily SAIDI values, closely approximates a log normal distribution. The 2.5 Beta Method is based on two facts. First, if a random variable has a log-normal distribution, the natural log of this random variable is said to have a normal distribution. Second, given that the daily SAIDI measures follow a log-normal distribution, the probability of a day being defined as a major event day is less than 1%.

Assuming the daily SAIDI follow a log-normal distribution, any day with a SAIDI greater than the threshold value, T_{MED}, is said to be a Major Event. The Major Event identification threshold, $T_{MED,}$ is calculated using the following procedure:

1. Assemble the preceding three to five years of daily SAIDI values,
2. Remove from the data set any day in which the daily SAIDI value was zero,
3. Take the natural log of each of the daily SAIDI values,
4. Calculate the mean, α, and the standard deviation, β, of the natural logs of the daily SAIDI values, and
5. Calculate the threshold, $T_{MED} = e^{(\alpha+2.5\beta)}$

Justification of 2.5 Beta Method

There are two underlying assumptions of 2.5 Beta Method. First, if a random variable has a log-normal distribution, the natural log of this random variable is said to have a normal distribution. Second, the daily SAIDI values exhibit a log-normal distribution and thus the natural log of the daily SAIDI value follow a normal distribution. The relationship between the two distributions can be used to assign probabilities to individual events, specifically, to the event $T_{MED} = e^{\alpha + 2.5\beta}$ where α and β are parameters describing the lognormal distribution. In particular we want to know the probability that the SAIDI measure for any given day will be greater than T_{MED}. As it turns out, this probability is less than one percent. A more detailed discussion of the relationship between the two distributions mentioned above can be found in Appendix A.

Test of Normality

For the 2.5 Beta Method to be valid, the daily SAIDI data must follow a log-normal distribution. That is, the log of the daily SAIDI data must follow a normal distribution. Using SAIDI data provided by PacifiCorp, the Division performed a normality test to determine if, under normal conditions, the natural log of PacifiCorp's daily SAIDI values approximate a normal distribution (testing if the daily SAIDI values have log-normal

distribution will lead to the same conclusion). The data covered the period from January 2000 to May 2003.

To implement the test, the Division used a Box-and-Whisker plot to identify any outliers in the data set. SAIDI values determined to be outliers were removed from the data set. Removing the outliers was essential to ensure that the remaining data represented "normal" operating conditions. To test for normality, the Division used the Chi-square goodness of fit, Kolmogorov-Smirnov, and Anderson-Darling normality tests. The null hypothesis tested was that the natural log of PacifiCorp's daily SAIDI values is normally distributed. Both the Chi-square and the Kolmogorov-Smirnov failed to reject the null hypothesis (at $p<0.05$ and $p<0.01$, respectively). The Anderson-Darling failed to accept the null hypothesis. However, for large data sets, the Anderson-Darling test is sensitive in detecting even slight deviations from normality. Hence, based on the results of the Chi-square and the Kolmogrov-Smirnov normality tests, the Division concludes that, under normal conditions, the natural log of PacifiCorp's daily SAIDI values is normally distributed and the use of the 2.5 Beta Method is justified. Therefore, the Division recommends the Commission to approve the proposed change in the major event definition.

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APPENDIX A

TWO AND ONE-HALF BETA METHOD

If the random variable X = lnY has a normal distribution, then Y is said to have a lognormal distribution. This relationship between the two distributions can be used to assign probabilities to events associated with Y, specifically, to the event $T_{MED} = e^{\alpha + 2.5\beta}$ where α and β are parameters describing the lognormal distribution. In particular we want to know the probability that the SAIDI measure for any given day will be greater than T_{MED}.

Normal Distribution

If the random variable X has a normal distribution with mean μ and variance σ^2 then we write $X \sim N(\mu, \sigma^2)$. Where "~" should be read as "is distributed as". The probability density function ("pdf") is given by

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} Exp\left[-\frac{1}{2\sigma^2}(x - \mu)^2 \right] \quad (1)$$

While the probability density function ("pdf") appears complicated, it turns out to be very convenient to work with. For example, one characteristic of the normal distribution is any linear transformation of a normal random variable is itself a normal random variable. In particular, the Z-score

$$Z = \frac{X - \mu}{\sigma} \quad (2)$$

is normally distributed with mean 0 and variance 1: Z ~ N(0, 1). Thus, the probability that the random variable X is less than some number *x*, is equal to the probability that Z (the Z-score) is less than the number $z = \frac{x - \mu}{\sigma}$. That is,

$$P(X \le x) = P\left(\frac{X-\mu}{\sigma} \le \frac{x-\mu}{\sigma}\right)$$
$$= P(Z \le z) \qquad (3)$$
$$= \Phi(z)$$

Lognormal Distribution

If the random variable X has a normal distribution as described above, and X = lnY or, in other words, $Y = e^X$, then Y is said to have a lognormal distribution with mean

$$E(Y) = e^{\mu + \frac{1}{2}\sigma^2} = Exp\left[\mu + \frac{1}{2}\sigma^2\right] \qquad (4)$$

and variance

$$Var(Y) = e^{2\mu + 2\sigma^2} - e^{2\mu + \sigma^2}$$
$$= Exp\left[2\mu + 2\sigma^2\right] - Exp\left[2\mu + \sigma^2\right] \qquad (5)$$

The pdf for the lognormal distribution is

$$f(y) = \frac{1}{y\sqrt{2\pi\sigma^2}} Exp\left[-\frac{1}{2\sigma^2}(\ln y - \mu)^2\right] \qquad (6)$$

Probabilities for the lognormal distribution can be defined in terms of the normal distribution. For example, the probability that Y is less than some number *y* is equal to the probability that X = lnY is less than *x* = ln*y*:

$$P(Y \le y) = P(\ln Y \le \ln y)$$
$$= P(X \le x) \qquad (7)$$

And following Equation (3), we can say

$$P(X \le x) = P(Z \le z) = \Phi(z) \qquad (8)$$

where $z = \frac{\ln y - \mu}{\sigma}$.

Two and One-Half Beta Rule

The Two and One-Half Beta rule is defined by the value $T_{MED} = e^{\alpha + 2.5\beta}$. In the case of PacifiCorp's major event definition, any daily SAIDI measure, say "y", which exceeds T_{MED}, is classified as a major event day. For example, suppose we have a series of daily SAIDI measures $y_1, y_2, \ldots, y_n$. It is assumed that the SAIDI measures follow a lognormal distribution so that, $x_i = \ln y_i \quad for\ i = 1, 2, \mathrm{L}\ , n$, will follow a normal distribution.

If we assume the mean and standard deviation of the normal distribution are α and β respectively, then the probability that the SAIDI for any given event exceeds T_{MED} can be easily found using the relationship between the normal and lognormal distributions. That is, for a given event whose SAIDI measure is equal to y, the probability that y is greater than T_{MED} is given by,

$$
\begin{aligned}
P\left(y > T_{MED}\right) &= P\left(y > e^{\alpha + 2.5\beta}\right) \\
&= P\left(\ln y > \alpha + 2.5\beta\right) && \textit{Taking logs} \\
&= P\left(x > \alpha + 2.5\beta\right) && \textit{By definition} \qquad (9) \\
&= P\left(z > \frac{\alpha + 2.5\beta - \alpha}{\beta}\right) && \textit{Using } Z-\textit{Score} \\
&= P\left(z > 2.5\right) && \textit{Simplifying}
\end{aligned}
$$

The probability that z exceeds 2.5 is less than 1 percent.[3] In other words, we would expect that less than 1 percent of a large sample of SAIDI measures would exceed T_{MED}. Thus the conclusion is drawn that for any given day, if the day's SAIDI measure exceeds T_{MED}, the day should be classified as a major event day.

Since α and β are not known, they will need to be estimated for a given sample of SAIDI measures. These estimates can be defined by $\hat{\alpha}$ *and* $\hat{\beta}$ respectively, where $\hat{\alpha}$ is equal to the arithmetic mean of the natural log of the SAIDI measures and $\hat{\beta}$ is equal to the standard deviation:

[3] From the standard normal table, which can be found in most elementary statistics texts, the probability that z exceeds 2.5 is equal to 0.0062.

$$\hat{\alpha} = \frac{1}{n}\sum_{i=1}^{n} \ln y_i$$

$$\hat{\beta} = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n} \left(\ln y_i - \hat{\alpha}\right)^2} \qquad (10)$$

ATTACHMENT A

ATTACHMENT B