Exhibit No. DMR-2T
Docket UE-140762 *et al.*
Witness: Dana M. Ralston

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PACIFIC POWER & LIGHT COMPANY,** **Respondent.**	**DOCKETS UE-140762 and UE-140617 (*consolidated*)**
In the Matter of the Petition of **PACIFIC POWER & LIGHT COMPANY,** **For an Order Approving Deferral of Costs Related to Colstrip Outage.**	**DOCKET UE-131384 *(consolidated)***
In the Matter of the Petition of **PACIFIC POWER & LIGHT COMPANY,** **For an Order Approving Deferral of Costs Related to Declining Hydro Generation.**	**DOCKET UE-140094 *(consolidated)***

PACIFIC POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF DANA M. RALSTON

November 2014

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Q. Are you the same Dana M. Ralston who previously submitted direct testimony in this case on behalf of Pacific Power & Light Company (Pacific Power or Company), a division of PacifiCorp?

A. Yes.

QUALIFICATIONS

Q. Please describe your education and professional experience.

A. I have a Bachelor of Science Degree in Electrical Engineering from South Dakota State University. I have been the Vice President of Thermal Generation for PacifiCorp Energy since January 2010. Before that, I held a number of positions of increasing responsibility with MidAmerican Energy Company for 28 years in the generation organization, including the plant manager position at the Neal Energy Center, a 1,600 megawatt generating complex. In my current role, I am responsible for operation and maintenance of the thermal generation fleet.

PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond to proposed Chehalis and Colstrip plant outage adjustments recommended by Mr. Bradley G. Mullins in his testimony on behalf of Boise White Paper LLC (Boise). I demonstrate that the Company's actions and the costs associated with the outages were prudent.

SUMMARY OF TESTIMONY

Q. Please summarize the Company's response to Boise's proposed adjustments pertaining to the Chehalis and Colstrip outages.

A. Boise proposes adjustments related to a 2013 outage at the Chehalis plant, claiming

that the outage was the result of imprudent plant operation and avoidable. Boise claims that had the Company taken additional steps based on information gathered from prior failures and monitoring equipment, the Company could have prevented the 2013 failure. My testimony demonstrates that the Company did investigate the prior failures, did not ignore any of the available information, and, in fact, used all of this information to support taking additional steps to install equipment monitors as well as working with outside experts and the Original Equipment Manufacturers (OEMs) of the equipment in question. The Company's management of the Chehalis plant was prudent, and the 2013 outage was not the result of management imprudence.

In the case of the Colstrip outage, Boise claims that outage was also caused by plant operator error. My testimony demonstrates that thorough investigation of the failure found that there was nothing that the plant operator could have done to prevent the outage and that the plant operator's actions were consistent with prudent plant operation.

CHEHALIS OUTAGE

Q. Please describe the outage that occurred at the Chehalis plant in November 2013.

A. The Chehalis plant has three generating units, and each unit has a generator step-up transformer (GSU). The GSU steps-up the generator voltage, which is 18,000 volts, to the 500,000 volts necessary for the transmission system. The 2013 outage occurred when one of the bushings on GSU 3 failed catastrophically, destroying the transformer.

Q. What is the basis for Boise's claim that the Company imprudently operated the Chehalis plant resulting in the 2013 outage?

A. Boise argues that the Company could have prevented the 2013 outage at Chehalis by using the information from two prior outages, in 2006 and 2011, as well as available monitoring data.[1]

Q. Do you agree with Boise's claim that the two prior outages should have caused the Company to operate the plant in a way that would have prevented the 2013 outage?

A. No. The 2006 outage was caused by a catastrophic failure of a bushing external to GSU 3 that destroyed the entire transformer. The root cause analysis that followed the 2006 outage, conducted by NGK (the bushing OEM) and Transformer Services, Inc., was unable to identify a specific root cause for the transformer's failure. And because GSU 3 was destroyed by the failure, the plant operator at the time (this pre-dated the Company's acquisition of the plant) replaced the transformer and bushing in 2007. Thus, the Company had no reason to believe further remedial action was required as a result of the 2006 outage.

Q. What was the cause of the 2011 outage?

A. The 2011 outage resulted from a failure of a bushing internal to GSU 1. The Company's investigation following the 2011 outage was comprehensive and included review by both the Company's own experts and third parties, including ABB Inc., the transformer manufacturer (FUJI), and the bushing manufacturer (NGK). The investigation included industry-standard electrical testing on GSU 2 and GSU 3,

[1] Testimony of Bradley G. Mullins, Exhibit No. BGM-1CT at 50-53.

including the bushings, internal transformer tank inspections of the failed unit, inspections of all three bushings from the failed transformer, and oil quality analysis. Despite this thorough investigation, a definitive root cause for the bushing failure in 2011 was not determined. The bushing manufacturer believed it was a transformer assembly issue, and the transformer manufacturer suspected it was a bushing issue. ABB Inc. believed the outage was due to an internal bushing failure, but whether that was a manufacturing or installation defect was not determined. Testing performed after the 2011 outage showed that Units 2 and 3 were suitable for service. Because a definitive root cause was never determined, there was no reasonable basis to take affirmative action to replace the GSUs because such action would have been based on speculation, not facts, and would have resulted in unjustifiable costs.

Q. Did the analysis following the 2011 outage shed any light on the 2006 outage?

A. Yes. In a subsequent report issued by NGK after the 2011 outage, NGK identified the most likely root cause of the 2006 event as damage to the bushing assembly during original installation. Again, that entire transformer, GSU 3, was replaced following the 2006 outage, and there was no reason to believe that when the new unit was installed the same damage occurred.

Q. What were the Company's options in 2011 without a definitive root cause of the failure?

A. Because there was no root cause identified and the transformer and bushing manufacturers asserted each of their designs was sound, the Company had two options: (1) install additional monitoring equipment to see if a failure mode and imminent failure could be identified; or (2) replace both remaining transformers at a

cost of over eight million dollars, not including the associated outage time required to install the transformers. Due to the uncertainty regarding whether the failures were anomalies or indicative of a widespread issue with the transformer or bushings, the Company proactively installed online dissolved gas analyzers and bushing monitoring equipment on the remaining transformers in 2011 and 2012, respectively.

Q. Was the data provided by the new monitors reviewed and considered by the Company in its decision to continue to operate the transformer before the 2013 outage?

A. Yes. The Company regularly analyzed the data provided by the monitors to assess whether there was a risk of additional failures. Whenever the data indicated that abnormal conditions were present, it was immediately reported to Chehalis plant personnel from the bushing monitoring equipment. When the Company received abnormal condition notices, the Company contacted the OEM to determine if the abnormal condition warranted action by the Company, such as removal of the transformer from service. In one instance, the Company discovered that the OEM had incorrectly commissioned the equipment. This issue was corrected before the 2013 failure.

Q. On the day of the 2013 failure, was there any indication from the GSU 3 monitors to suggest failure was imminent?

A. No. On the day of the failure, the bushing health monitor did not report values in either the non-critical or the critical alarm ranges.

Q. The report issued following the 2013 outage included recommendations regarding the monitoring equipment. Boise implies that these recommendations suggest that the Company's actions before the 2013 outage were imprudent.[2] Do you agree?

A. No. The Company was monitoring the situation using all of the information available at the time, and no alarm values existed on the day of the failure until the actual failure occurred. The recommendations were improvements to data availability. Boise is implying that the data was not available to the plant, which is incorrect. There is no basis to assume that if the Company had implemented all of the recommendations in the 2013 report that the 2013 outage would have been avoided.

Bushing monitors are not typical of transformer installations, and, in fact, these are the only monitors in the entire PacifiCorp fleet. The monitors were installed with the expectation they would provide valuable data to the Company, but as we have learned, the accuracy of the monitors has been questionable, causing false indications. The Company and the OEM continue to work to resolve these issues to improve the value of the system.

Q. Has the Company implemented the recommendation referenced by Boise in the 2013 report?

A. Yes. The Company implemented the recommendations after the report was issued.

Q. What did the Company do after the 2013 failures to prevent future issues?

A. In conjunction with bushing suppliers and insulation experts, the Company installed higher rated bushings on GSU 2 (the only remaining FUJI transformer) from a

[2] Testimony of Bradley G. Mullins, Exhibit No. BGM-1CT at 52.

different supplier and custom modified the bushing shields. Based on the engineering review by the insulation experts, we believe this will provide a superior design compared to the original design.

Q. Why didn't the Company replace the bushings after the 2011 failure?

A. First and foremost, the Company did investigate the possibility of replacing the bushings in 2011 with the transformer manufacturer. High voltage bushings are integral to any transformer design and as such the transformer manufacturer should normally approve their replacement. Transformer bushings are not universally interchangeable; the Company could not have just selected another manufacturer and installed different bushings without an extensive engineering review. The Company was informed in 2011 by the transformer OEM that its only option would be to replace the bushings with identical NGK bushings. Replacing the existing bushings with identical bushings when the existing bushings had passed testing with acceptable results did not appear to provide any benefit, especially where no definitive root cause was identified. After the 2013 failure, the Company determined that it was necessary to ask other industry experts what it could do to replace the bushings as the transformer manufacturer was not providing solutions to this problem. The bushings were replaced with ABB bushings after outside experts reviewed the transformer design and bushing application. As a result of the review, non-standard modifications were also required to the bushing shields to accommodate the ABB bushings. After the Company performed the review with outside experts, the new bushings and modifications were installed, and the transformer was put back in service.

Q. Do you believe the Company used all available information to prudently manage the Chehalis plant and minimize risk of outages?

A. Yes. Following the 2006 and 2011 outages, the Company prudently engaged in a full battery of tests and involved the transformer and bushing OEM, outside experts, and the Company's subject matter experts in the root cause analysis. The results of the root cause analysis for the 2006 and 2011 outages were inconclusive and without a definitive root cause. Also, because the failure modes were different in 2006 and 2011, the Company took prudent and proactive actions to monitor the issue. The Commission should find that the 2013 outage was not the result of imprudent plant operation.

COLSTRIP OUTAGE

Q. Boise argues that the Colstrip outage was caused by plant operator error as a result of repair work that was done at the time of a prior outage.[3] Is there any basis for Boise's claim of operator imprudence?

A. No. Boise claims that because the root cause scenario could not identify with certainty the cause of the outage, the analysis does not support a conclusion that the operator was not at fault. But the root cause analysis states that, "[a]lthough there was no 'smoking gun' which clearly indicated the cause of failure **there were a set of facts and timing available to form the basis for the most likely failure scenarios**."[4] The "facts and timing" analyzed in the root cause report supported the conclusion that the operator was not at fault.

Boise suggests that factual evidence available was not adequate to develop a

[3] Testimony of Bradley G. Mullins, Exhibit No. BGM-1CT at 66.

[4] Testimony of Bradley G. Mullins, Exhibit No. BGM-4C (emphasis added).

failure cause and that concrete evidence and a clear indication of failure must be present to show the Company's actions were prudent.[5] However, the failure report was very detailed and used all the information available, including plant logs, relay and alarm data, and physical inspections of the damage by industry expects. Boise discounts the statement by the external root cause investigating team that, "[i]n our opinion, PPL did everything according to standard industry practice such as hiring the OEM (Siemens) to perform the maintenance, performing El Cid testing on the core, operating their unit according to industry practice, (since there was no indication of mis-operation), and protecting the unit with adequate relay protection. Nothing they did or could have done, could have prevented this failure."[6] This statement, along with the rest of the report, demonstrates that the Company acted prudently and took all recommended steps to maintain the equipment as per the OEM recommendations.

The implication of Boise's argument is that in the absence of definitive evidence of the cause of an outage, the Company cannot demonstrate that the plant operator was prudent. This implication is unreasonable.

Q. Is there any evidence supporting Boise's conclusion that the repair work following the prior outage was the cause of this outage?

A. The root cause analysis indicates that prior repair work "could" have caused initial damage that ultimately lead to the outage. However, the experts that authored the root cause analysis nonetheless found that the plant operator was prudent and that the available evidence did not indicate that the operator could have prevented the outage.

[5] Testimony of Bradley G. Mullins, Exhibit No. BGM-1CT at 65.
[6] Testimony of Bradley G. Mullins, Exhibit No. BGM-4C.

Thus, Boise's claim is speculation unsupported by the expert analysis in the root cause report.

FLEET PERFORMANCE

Q. How did the PacifiCorp fleet perform in 2013?

A. In 2013 the average equivalent availability factor (EAF) for the PacifiCorp thermal fleet on an ownership basis was 90.65 percent and includes the outages at Chehalis and Colstrip, while the 2012 NERC average for a comparable fleet was 82.60 percent. This is over eight percent better than the industry average. This data shows our customers are receiving a significant benefit and PacifiCorp effectively and prudently operates its generating fleet.

Q. Does this conclude your rebuttal testimony?

A. Yes.