

**Exh. DCG-8  
Docket UE-200115  
Witness: David C. Gomez**

**BEFORE THE WASHINGTON  
UTILITIES AND TRANSPORTATION COMMISSION**

**In the Matter of the Application of**

**DOCKET UE-200115**

**PUGET SOUND ENERGY**

**For an Order Authorizing the Sale of All  
of Puget Sound Energy's Interests in  
Colstrip Unit 4 and Certain of Puget  
Sound Energy's Interests in the Colstrip  
Transmission System**

**EXHIBIT TO  
TESTIMONY OF**

**David C. Gomez**

**STAFF OF  
WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION**

*Docket UE-190882, Testimony of Charles L. Tack, Exh CLT-1CCTr*

**October 2, 2020**

Company-confidential per Protective Order in Docket UE-190882  
Exhibit No. CLT-1CCTr  
Docket UE-190882/UE-190458  
Witness: Charles L. Tack

**BEFORE THE WASHINGTON  
UTILITIES AND TRANSPORTATION COMMISSION**

In the Matter of the Investigation of  AVISTA CORPORATION d/b/a AVISTA UTILITIES, PUGET SOUND ENERGY, and PACIFIC POWER & LIGHT COMPANY,  Regarding the Prudency of Outage and Replacement Power Costs	Docket UE-190882
In the Matter of  PACIFIC POWER & LIGHT COMPANY,  2018 Power Cost Adjustment Mechanism	Docket UE-190458

**PACIFIC POWER & LIGHT COMPANY**

**REDACTED – COMPANY-CONFIDENTIAL DIRECT TESTIMONY OF  
CHARLES L. TACK**

**REVISED February 7, 2020**

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## ATTACHED EXHIBITS

Exhibit No. CLT-2CCr—Selected Excerpts from the Colstrip Operating and Ownership Agreement (Company Confidential)

Exhibit No. CLT-3Cr—Shared Units Weekly Status Report (Confidential)

Exhibit No. CLT-4CCr—2017 MATS PM Data Results Slide (Company Confidential)

Exhibit No. CLT-5CCr—Internal Email from Talen (Company Confidential)

Exhibit No. CLT-6CCr—Description of Talen’s activities to track MATS PM level after February 2018 (Company Confidential)

Exhibit No. CLT-7CCr—Spreadsheet used by Talen to track alternate indicators (Company Confidential)

Exhibit No. CLT-8CCr—E-mail notification to MDEQ (Company Confidential)

Exhibit No. CLT-9CCr—Timeline of the Colstrip Outage (Company Confidential)

Exhibit No. CLT-10CCr—Root Cause Analysis (Company Confidential)

Exhibit No. CLT-11—MDEQ Consent Decree Stipulation

Exhibit No. CLT-12—MDEQ Penalty Assessment

Exhibit No. CLT-13—MDEQ Press Release

Direct Testimony of Charles L. Tack

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1 **Q. Please state your name, business address, and present position with PacifiCorp.**

2 A. My name is Charles (Chuck) L. Tack and my business address is 1407 North Temple,  
3 Salt Lake City, Utah 84116. I am currently employed as Managing Director of  
4 Generation Support at PacifiCorp. I am testifying for PacifiCorp d/b/a Pacific Power  
5 & Light Company (Pacific Power).

6 **QUALIFICATIONS**

7 **Q. Please describe your education and professional experience.**

8 A. I hold a Bachelor's degree in Civil Engineering from the University of Nebraska, a  
9 Masters in Energy Business from the University of Tulsa, and am currently working  
10 towards a Masters in Finance from the University of Utah. Before joining Pacific  
11 Power, I held a Senior Reactor Operators License at Fort Calhoun Nuclear Station  
12 and a Senior Reactor Operators Certification at Cooper Nuclear Station. I joined  
13 Pacific Power in 2017 and worked in various engineering and operational (including  
14 Shared Unit Director) positions before becoming Managing Director of Generation  
15 Support in 2019.

16 **PURPOSE OF TESTIMONY**

17 **Q. What is the purpose of your testimony?**

18 A. Through this testimony, I will provide an explanation of the events leading up to the  
19 Environmental Protection Agency (EPA) Mercury and Air Toxic Standards (MATS)  
20 Particulate Matter (PM) outage at the Colstrip generating station, Pacific Power's  
21 understanding of the actions that were taken prior to the outage, and the actions that  
22 were taken after the outage occurred.

1           **PACIFIC POWER’S INVOLVEMENT IN THE COLSTRIP PLANT**

2   **Q.    Please provide some background on the Colstrip plant.**

3   A.    The Colstrip plant is a four unit coal-fired power plant located in Montana. The plant  
4        is jointly-owned by various parties, of which Pacific Power is a 10 percent owner in  
5        Unit 3 and Unit 4. It is my understanding that only the company’s ownership of Unit  
6        4 is included in the company’s Washington rates. The operator, Talen Montana  
7        (Talen), plans and carries out the daily operation of the facility.

8   **Q.    Please explain how Pacific Power participates in the on-going operations of**  
9        **Colstrip?**

10   A.    Pacific Power has a representative on the Ownership and Operating (O&O)  
11        Committee, through which the owners who are not involved in the day to day  
12        operation of Colstrip are kept informed on matters related to the operation and  
13        maintenance of the plant. Additionally, Pacific Power maintains on-going contact  
14        with Talen on an as-needed basis to address any issues that may arise. As the plant  
15        operator, Talen has authority to act as an agent for the owners and “

16        [REDACTED]  
17        [REDACTED]”<sup>1</sup>

18   **Q.    In 2018, what was your role in the on-going operations of Colstrip?**

19   A.    Throughout 2018, I was Pacific Power’s representative on the O&O Committee.<sup>2</sup>  
20        Through that role, I attended meetings (in person or via telephone) of the O&O

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<sup>1</sup> Exhibit CLT-2CCr at Section 3(d). This Exhibit contains selected sections from the Colstrip Ownership and Operation Agreement. I am not an attorney, however, I have quoted and provided certain sections of this agreement to support my understanding of how operations work in practice.

<sup>2</sup> The O&O Committee is referred to as the “Project Committee” in the Colstrip Ownership and Operation Agreement, *See* Exhibit CLT-2CCr at Section at 17.

1 Committee and participated in the discussions on the Colstrip MATS PM outage as  
2 Pacific Power's representative.

3 **Q. How often did the O&O Committee meet in 2018?**

4 A. The O&O Committee is required to meet on a quarterly basis, however, meetings  
5 occur monthly.

6 **Q. What was generally discussed at the O&O Committee meetings?**

7 A. Generally, all the O&O Committee meetings followed the same format. Talen would  
8 provide updates on the following areas: safety, fuels, environmental, generation/plant  
9 performance, and financial. After the updates, we would move into executive session  
10 for further discussion on more sensitive matters. For example, this could include  
11 discussion of topics between owners, direction the owners would like to see the plant  
12 go, contract challenges with vendors, staffing changes, etc. During the regular part of  
13 the O&O Committee meeting, many representatives from different Talen departments  
14 (safety, operations, fuels, etc.) attend. In the executive session, these individuals  
15 leave the meeting.

16 **Q. How do you assess the information that Talen provides you in these meetings on  
17 plant operations?**

18 A. I have spent a significant portion of my career in operations, first in nuclear power  
19 plants, then in support of PacifiCorp's thermal generation fleet (coal, natural gas, and  
20 geothermal). As Talen discusses plant operations, I assess the information and  
21 direction provided based on my experience. This information, which usually includes  
22 many follow up questions, provides good context for me to filter and understand the  
23 issues. Additionally (when I feel an issue warrants more attention or do not think the

1 direction is appropriate), I reach out to our internal experts for back-up to ensure  
2 alignment with Pacific Power's practices. It is my job as Pacific Power's  
3 representative to critically assess and challenge the information provided by Talen.

4 **Q. How do you communicate and discuss decisions on operational issues with Pacific  
5 Power's management?**

6 A. I am in regular contact with my boss, Dana Ralston, who is the Senior Vice President  
7 of Thermal Generation, Coal Generation, and Mining. Decisions and updates I feel are  
8 applicable were documented in the Shared Units Weekly Status Report.<sup>3</sup>

9 **THE RISE IN PARTICULATE MATTER LEVELS IN EARLY 2018**

10 **Q. Please explain how Talen tests for compliance with the PM levels in order to  
11 comply with the Mercury Air Toxics Standards (MATS)?**

12 A. To obtain a source's PM emission rate, a probe is inserted into the exhaust stack and a  
13 pump draws flue gas through a filter media. The stack testers follow a prescribed EPA  
14 test method which allows them to determine stack PM emissions on a pound-per-hour  
15 or pound-per-million British Thermal Unit (BTU) basis. Compliance with the MATS  
16 PM limit for Colstrip is demonstrated by the daily weighted site-wide rolling 30-day  
17 average PM emission rate of all four Colstrip Units as directed by the EPA.

18 **Q. When did Talen first inform you that the rising PM levels had triggered  
19 increased monitoring?**

20 A. During an O&O Committee meeting on February 21, 2018, Talen informed  
21 committee members that although the plant was still in compliance, there were  
22 elevated MATS PM levels in the official compliance tests that had occurred on

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<sup>3</sup> A redacted version of this report, containing only information pertaining to Colstrip is attached as Exhibit CLT-3Cr.

1 February 7, 2018 and February 9, 2018 for Units 3 and 4. Talen then discussed that  
2 they were looking into the potential source of the elevated PM levels. As elevated  
3 levels were not expected, Talen's approach was to investigate what could be causing  
4 the elevated PM levels while monitoring alternate indicators. These alternate  
5 indicators are not official compliance measurements but help provide additional  
6 evidence of whether the PM was still within acceptable limits. Along with this, Talen  
7 discussed that PM levels are impacted by many variables, so the results are not linear  
8 and often increase or decrease quarterly.<sup>4</sup>

9 **Q. Did you have any additional conversations with Talen regarding the elevated**  
10 **PM levels?**

11 A. Yes, after being informed of the elevated PM levels, I had multiple additional  
12 conversations with Talen's representatives regarding my concerns around the  
13 elevated PM levels. I asked for more specificity regarding the actions that were being  
14 taken to find the cause of the elevated PM levels and what alternate indicators they  
15 used to help ensure compliance was maintained in the interim between official  
16 compliance tests. Additionally, attached as Exhibit CLT-5CCr is an internal email  
17 from Talen, that was provided to Pacific Power after the outage was resolved.<sup>5</sup> This  
18 email documents the actions that were taken in February in response to the elevated  
19 PM levels.

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<sup>4</sup> The significant variability in PM levels through 2017 is shown in Exhibit CLT-4CCr, which was a slide developed for a workshop with UTC Staff.

<sup>5</sup> This was provided to Pacific Power after additional discussions with Talen in November of 2019.



1 **Q. What actions were being taken by Talen to find the cause of the elevated PM**  
 2 **levels?**

3 A. Through the additional conversations, Talen informed me that they were monitoring  
 4 and evaluating the following alternative indicators for PM levels:



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 12 While the alternate indicators are not official compliance tests that are submitted to  
 13 the Montana Department of Environmental Quality (MDEQ), they provide other  
 14 important ways to measure PM levels that can be correlated to the official compliance  
 15 test. These indicators provide real time (not official compliance) data for plant  
 16 operations that help indicate whether PM levels are within the permitted limits. I  
 17 have attached a narrative description of each of these items as well as results for the  
 18 time period in question. Attached to this testimony is a document that shows Talen’s  
 19 tracking of these metrics after the February compliance test.<sup>6</sup>

20 **Q. Based on your experience in plant operations, how do you respond when a single**  
 21 **indicator is elevated, like the PM levels in early 2018?**

22 A. It is my experience that when a single indicator like the measurement of MATS PM  
 23 levels in a compliance test is elevated, you start examining and troubleshooting other  
 24 indicators to correlate with and validate those results. On-going monitoring,  
 25 operation evaluations, and extra attention are generally accepted operating practice in

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<sup>6</sup> Exhibit CLT-6CCr. This Exhibit was originally developed after the outage in response to questions from UTC Staff and provided to them after a workshop between PacifiCorp and the UTC Staff on September 20, 2019.

1 helping identify if the issue is real or a false positive. There are multiple components  
2 and parameters throughout a power plant that, over the course of the year, may have  
3 random negative anomalies or outlier results. Operators monitor multiple data points  
4 (alternate indicators) to determine trends and gather as much information as available  
5 (not just single points) to understand if a specific reading represents a real or random  
6 issue. Many times an issue (real or false) can only be identified when the unit is  
7 operating.

8 If the Operator immediately shuts down every time there is a concern of an  
9 elevated parameter, the unit would cycle significantly more, placing large amounts of  
10 stress on staff and existing equipment as well as negatively impacting any  
11 troubleshooting efforts. Information gained through troubleshooting is vital to  
12 operations, planned decisions can be made about taking a unit offline, maintenance  
13 needed, risk, valid / invalid results, and/or continuing to build a trend based on  
14 existing operations.

15 **Q. Was there any follow-up on this issue in the O&O Committee meeting that**  
16 **occurred on March 21, 2019?**

17 A. Yes. At the meeting, Talen discussed that they had not identified any items causing  
18 the elevated PM levels and that the alternate indicators they were monitoring and  
19 evaluating indicated PM levels should be within compliance limits. Talen was not  
20 concerned about an exceedance and discussed that they would continue to look for  
21 what caused the elevated PM in the February tests as well as continue monitoring  
22 alternate indicators of current PM levels. Exhibit CLT-7CCr is a spreadsheet that was  
23 used by Talen to track plant parameters (unofficial MATS PM results) while

1 evaluating the impacts from troubleshooting efforts during this time period. This  
2 spreadsheet was provided to PacifiCorp after the outage occurred in response to UTC  
3 staff questions.

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

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3 [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 **Q. Through the discovery process, some parties have raised questions about the**  
 9 **functionality of the coal conveyor or the coal sampler. Did the functionality of**  
 10 **these pieces of equipment have any effect on the outage?**

11 A. No. From my understanding of the causes of the outage and the rise in PM levels,  
 12 any issues with the coal sampler and the coal conveyor had minimal to no effect on  
 13 the cause of the outage. As I stated above, the coal that was delivered met the  
 14 contractual specifications.

**THE COLSTRIP OUTAGE**

16 **Q. When did Talen inform Pacific Power that there would be an outage at Colstrip?**

17 A. On June 27, 2018, Talen contacted all co-owners for an emergency meeting. At this  
 18 meeting, the owners were informed that Unit 3 and Unit 4 had failed the official  
 19 second quarter MATS PM compliance tests and the units would be coming offline  
 20 expeditiously to address the issue.

1 **Q. Market prices were lower from February through May, should Talen have taken**  
2 **steps for a planned outage in the early part of the year, and would that have**  
3 **prevented a forced outage later in the year?**

4 A. As discussed above, in the first quarter of 2018, we were informed by Talen that  
5 official MATS PM compliance was met but with elevated levels. At that time the  
6 elevated PM level was a single data point and unexpected. Talen was confident they  
7 would maintain compliance based on the alternate indicators they were monitoring as  
8 well as plant parameters they were evaluating. From my discussions with Talen, they  
9 did not believe they would fail the second quarter official PM test. If Talen would  
10 have provided any hint that they believed the units would fail official testing, Pacific  
11 Power would have told them our standard position is to immediately shut down the  
12 units and address the concern. Pacific Power's priority is to ensure that Colstrip  
13 meets safety, environmental and compliance requirements.

14 **Q. What steps were taken after Units 3 and 4 were taken offline?**

15 A. Talen continued testing, cleaning, analysis, and evaluations of individual variables to  
16 determine if they could find the source of the elevated PM levels. Along with this,  
17 Talen continued to use in-house experts and got outside experts involved to help  
18 investigate the cause of the elevated PM levels. Each week there was a plan to  
19 investigate new variables. Unit 3 was the lead with Unit 4 following—they would  
20 address items on the Unit, then bring the Unit up to power and perform an unofficial  
21 MATS PM test to determine if they were passing or if the items addressed had any  
22 impact.

1 **Q. Did Talen reach out to industry experts for assistance?**

2 A. Yes. Talen reached out to Architect Engineering Consulting Operations  
3 Maintenance (AECOM) and Air Control Techniques (ACT) to consult and help  
4 address the PM levels. AECOM are experts in coal fired pollution control  
5 equipment. ACT are specialists in stack gas testing & analysis.

6 **Q. Did Talen keep the owners informed of their actions?**

7 A. Yes. Talen continued to keep the owners informed of the actions they were taking  
8 throughout the outage. A couple weeks into the outage, daily phone calls were had  
9 with the owners to discuss findings and direction.

10 **Q. Did Pacific Power provide any assistance to Talen as the outage progressed?**

11 A. Yes. A few weeks into the outage as the issues continued to be a challenge, Pacific  
12 Power offered to send our experienced engineers to provide assistance to Talen.  
13 Talen accepted, and two of Pacific Power's engineers traveled to Talen to support.  
14 Along with this, when Pacific Power was notified of the official compliance test  
15 failure in late June, internally multiple environmental engineers and generation  
16 support engineers were brought into discuss what we felt was the best approach  
17 forward. From there we monitored Colstrip's approach and provided informal  
18 feedback on ideas that might help.

19 **Q. How long did the outage last?**

20 A. In September of 2018, Units 3 and 4 passed the official MATS PM compliance test  
21 and were brought back online. Exhibit CLT-9CCr provides a timeline detailing the  
22 events that led up to and during the outage.

1 **Q. In your opinion, were the actions taken by Talen before and after the outage**  
2 **consistent with prudent utility practice?**

3 A. Yes. Consistent with prudent utility practice, Talen recognized that although the  
4 facility was in compliance during the February testing, they still required increased  
5 attention and evaluation of the PM emissions. Talen monitored numerous alternate  
6 indicators and conducted trouble-shooting to evaluate whether the higher PM levels  
7 represented a trend or were an anomaly. These alternate indicators and evaluations  
8 indicated a likelihood that the limits for the second quarter compliance test would not  
9 be exceeded. However, when the official compliance test results failed (and did not  
10 align with the alternate indicators), Talen expeditiously shut-down the units and  
11 brought in outside experts to help find and address the cause of the higher PM levels.  
12 It took several months of the combined efforts of Talen's staff and outside experts,  
13 including staff from PacifiCorp, to find and address the causes of the higher PM  
14 levels, indicating the complexity of the problem.

#### 15 **ROOT CAUSE ANALYSIS FOR THE COLSTRIP OUTAGE**

16 **Q. Did the owners hire an independent firm to conduct a root cause analysis (RCA)**  
17 **to determine the cause of the outage?**

18 A. Yes. Sologic was contracted to conduct an RCA to determine the cause of the  
19 elevated PM levels and determine appropriate corrective steps.

20 **Q. What did Sologic determine in their RCA?**

21 A. Through their analysis, Sologic determined that the elevated PM levels were due to a  
22 combination of factors including:

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[REDACTED]



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[REDACTED]

Each of these elements is explained in detail in the RCA which is attached to this

testimony as Exhibit CLT-10CCr. The RCA goes on to conclude, “[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]”<sup>10</sup>

**Q. Please summarize the preventive/corrective action items described in the RCA and indicated whether they have been implemented?**

**A. The following actions are Recommended Solutions which have been implemented or are in progress:**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

• [REDACTED]

[REDACTED]

<sup>10</sup> Exhibit CLT-10CCr at 4.  
<sup>11</sup> Exhibit CLT-10CCr at 5.  
<sup>12</sup> Exhibit CLT-10CCr at 5.  
<sup>13</sup> Exhibit CLT-10CCr at 5.

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]<sup>14</sup>

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

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11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 **MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY CONSENT**

16 **DECREE**

17 **Q. Was the MDEQ informed of the failure of the PM test in late June of 2018?**

18 A. Yes. The MDEQ was promptly informed after the failure of the PM test in June of  
19 2018.

20 **Q. Did the MDEQ conduct an investigation of the violation of the MATS PM levels**  
21 **at Colstrip?**

22 A. Yes. MDEQ conducted an investigation, and Talen has worked cooperatively with

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<sup>14</sup> Exhibit CLT-10CCr at 5.

1 MDEQ through the investigation which resulted in a penalty assessment and a  
2 consent decree which was filed in Montana district court on November 25, 2019. The  
3 consent decree and penalty assessment are attached as Exhibit CLT-11 and Exhibit  
4 CLT-12.

5 **Q. What was the penalty assessed by MDEQ?**

6 A. Talen has agreed to a penalty of \$450,000 for air quality emissions and reporting  
7 violations at the Colstrip generating station.<sup>15</sup> The penalty amount includes a  
8 payment of \$112,500 to MDEQ as well as funding two supplemental environmental  
9 projects to benefit local communities.

10 **Q. Did the Penalty Assessment include an evaluation of the events leading up to the**  
11 **outage?**

12 A. Yes. The MDEQ determined that Talen took extensive measures to investigate  
13 elevated PM levels after February 2018 testing and that those investigations indicated  
14 the units were in compliance:

15 While the individual unit emission rates have experienced increases and  
16 decreases over the years, the weighted average PM emission rate had a slight  
17 upward trend, indicating a shrinking compliance margin over time. The PM test  
18 from the first quarter 2018 showed a decrease in PM emissions for Unit 1;  
19 however, Units 2, 3 and 4 all showed increases in PM emissions to their highest  
20 reported weighted average since MATS took effect in 2016. The results yielded  
21 a weighted average emission rate equal to the permit limit of 0.030 lb/MMBtu,<sup>16</sup>  
22 prompting Talen to investigate possible reasons for the elevated PM emissions.  
23 Talen reviewed indicators in the CAM plan,<sup>17</sup> reviewed operations and  
24 maintenance, scrubber plumb bob delta P,<sup>18</sup> opacity and PM CEMS<sup>19</sup> data and  
25 found no indicators of abnormal operations and no causes of higher PM  
26 emissions.<sup>20</sup>

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<sup>15</sup> Exhibit CLT-13, MDEQ Press Release on Consent Decree.

<sup>16</sup> Pounds per million BTU.

<sup>17</sup> Continuous Assurance Monitoring Plan.

<sup>18</sup> The scrubber delta p investigations looked at how adjusting a “bob” to control turbulence at an inlet impacted PM levels.

<sup>19</sup> Continuous Emissions Monitoring System.

<sup>20</sup> Exhibit CLT-12, page 2.

1 The consent decree and penalty calculation do not make any finding that Talen failed  
2 to take any operational measures that would have prevented the elevated PM levels.

3 **Q. Can you provide an explanation of the reporting violations that were assessed by**  
4 **MDEQ?**

5 A. MDEQ assessed an administrative reporting violation against Talen for an inaccurate  
6 compliance certification. Talen submitted a required semi-annual compliance  
7 certification after the June compliance testing that inaccurately stated the units had  
8 been in continual compliance. Talen had submitted a report that included  
9 documentation and disclosure of the noncompliance, and had also reported it verbally  
10 to MDEQ. However, the compliance certification was not accurate as submitted due  
11 to an administrative error. After MDEQ notified Talen of the improper certification,  
12 Talen submitted a corrected compliance certificate.<sup>21</sup>

13 **Q. Did the MDEQ identify any corrective actions that should be taken?**

14 A. Yes. However, no new or different operating requirements were identified. Instead,  
15 MDEQ required some additional reporting and monitoring to confirm on-going  
16 compliance. As part of MDEQ Enforcement Action requirements, MDEQ requires  
17 Talen to conduct additional monthly monitoring to ensure PM levels remained below  
18 the limits. MDEQ also required updates to Talen's testing protocols to ensure  
19 accurate testing. MDEQ also required Talen to submit a report to confirm that  
20 scrubbers on the units were operating as required by the permit.<sup>22</sup>

21 **Q. Has Talen implemented these corrective actions?**

22 A. Yes. Talen is conducting the additional monthly testing. Talen acted proactively in

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<sup>21</sup> See Exhibit CLT-12.

<sup>22</sup> Exhibit CLT-13.

1 December of 2018 (after discussions with MDEQ), and started monthly testing of  
2 MATS PM levels. The other actions will be performed as required per the official  
3 MDEQ Enforcement Action.

4 **CONCLUSION**

5 **Q. Please summarize your testimony.**

6 A. Beginning in February of 2018, Talen saw elevated MATS PM levels. As a result,  
7 Talen began taking actions (generally accepted operation practices) to determine the  
8 cause of the elevated MATS PM levels by tracking alternate indicators that would  
9 correlate to the MATS PM levels. These alternate indicators supported the  
10 conclusion that MATS PM levels would pass the next official test. However, the PM  
11 levels did not pass the next official test. This caused Units 3 and 4 to enter into a  
12 forced outage. Through the outage, Talen took numerous actions that individually  
13 decreased the MATS PM results until official compliance was met. After consulting  
14 numerous engineers, consultants, including Pacific Power's experts, a single root  
15 cause was not found. The RCA stated that there were four causes that likely in  
16 combination caused the event. These four causes have driven numerous corrective  
17 actions to ensure that this sort of outage does not occur again.

18 **Q. Does this conclude your direct testimony?**

19 A. Yes.