

**BEFORE THE ARKANSAS PUBLIC SERVICE COMMISSION**

**IN THE MATTER OF THE APPLICATION OF )**  
**OKLAHOMA GAS AND ELECTRIC COMPANY )**  
**SEEKING A DECLARATORY ORDER FINDING ) DOCKET NO. 17-030-U**  
**ITS MUSTANG GENERATION PLANT )**  
**MODERNIZATION PLAN IS CONSISTENT )**  
**WITH THE PUBLIC INTEREST )**

**DIRECT TESTIMONY OF KEVIN D. WOODRUFF**  
**on behalf of**  
**THE ATTORNEY GENERAL**

November 15, 2017

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**DOCKET NO. 17-030-U**

**DIRECT TESTIMONY OF KEVIN D. WOODRUFF**

**I. INTRODUCTION**

**Q. Please state your name, business affiliation, and business address.**

A. I am Kevin D. Woodruff, Principal of the consulting firm of Woodruff Expert Services. My business address is 1127 – 11<sup>th</sup> Street, Suite 514, Sacramento, California 95814.

**Q. Please state your qualifications.**

A. I have worked for over thirty years in the energy utility industry, principally in the fields of electric utility resource planning and procurement, electric asset valuation, and electric system and market modeling. I worked almost seventeen years for consulting and software firms that offered such services and related software and data products. I have operated my own consulting practice for fifteen years to provide expert analysis and testimony regarding such matters to organizations representing the interests of small electric consumers before state regulatory Commissions. My resume is provided as Exhibit KDW-1 to this testimony.

**Q. Have you previously filed testimony with regulatory Commissions?**

A. Yes. I have filed testimony with both the California Public Utilities Commission and California Energy Commission, and the state utility regulatory commissions of Montana, Texas, Nevada and Washington. I have filed testimony with this Commission in several dockets over the past ten years, including Docket Nos. 06-152-U, 10-011-U, 12-008-U, 12-038-U, 14-118-U, 15-014-U.

1    **Q.    On whose behalf are you appearing in this docket?**

2    A.    I am appearing on behalf of the Office of Arkansas Attorney General  
3        Leslie Rutledge (“the AG”).

4    **Q.    What topic do you address in this testimony?**

5    A.    I am filing this Direct Testimony to address the application of the  
6        Oklahoma Gas and Electric Company (“OG&E”) for a Declaratory  
7        Order finding that its Mustang Generation Plant Modernization Plan  
8        (“Plan”) is consistent with the public interest.<sup>1</sup>

9    **Q.    What is OG&E’s Mustang Generation Plant Modernization**  
10       **Plan?**

11   A.    Pursuant to this Plan, OG&E is building seven new Combustion  
12        Turbine generators (“CTs”) on the site of its Mustang Generation Plant  
13        (“Mustang”) to replace the four gas-fired steam generation plants that  
14        OG&E has either already retired or plans to retire by December 31,  
15        2017 (“Units 1-4”).<sup>2</sup> I refer below to these seven new units, and the  
16        Plan generally, as the “Mustang CTs.”

17   **Q.    Please summarize your conclusions and recommendations to**  
18       **the Commission regarding OG&E’s new Mustang CTs.**

19   A.    The retirement of Mustang 1-4 and their replacement with the new  
20        Mustang CTs both appear to be reasonable changes to OG&E’s electric  
21        generation resources.

22   **Q.    Do you have any other issues you wish to address related to the**  
23       **Mustang CTs?**

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<sup>1</sup> Application, p. 4.

<sup>2</sup> In response to the 5<sup>th</sup> Question of the AG’s 1<sup>st</sup> Data Request, OG&E stated that Mustang Units 1 and 2 were retired December 31, 2015 and that the expected retirement dates for Mustang Units 3 and 4 is December 31, 2017. In the same response, OG&E said the seven new CTs – Units 6 to 12 – would reach their Commercial Operation Dates between November 24, 2017 and January 18, 2018.

1 A. Yes. Though the construction of the Mustang CTs appears to be  
2 reasonable, OG&E's application and testimony raised three matters  
3 that merit the Commission's attention, if not in this docket, then  
4 possible future dockets: (a) OG&E's decision to directly contract for  
5 construction of the Mustang CTs, rather than hire an Engineering,  
6 Procurement and Construction ("EPC") contractor, (b) the sometimes  
7 incomplete documentation offered by OG&E and the Southwest Power  
8 Pool ("SPP") of the reliability benefits of the Mustang CTs, and (c)  
9 statements regarding the increased "VAR" Capability of the new  
10 Mustang. I discuss these issues more fully below.

## 11 12 II. ANALYSIS AND RECOMMENDATIONS

### 13 14 A. The Replacement of Mustang Units 1-4 with the New Mustang 15 CTs Appears Reasonable

16 Q. What is the basis for your conclusion that the retirement of  
17 Mustang 1-4 and construction of the Mustang CTs was a  
18 reasonable action for OG&E to take?

19 A. To reach this conclusion, I reviewed OG&E's testimony, workpapers  
20 and answers to data requests that OG&E submitted in this docket and  
21 applied my own analytic skills and judgment to the question of  
22 whether the retirement of Mustang 1-4 and construction of the  
23 Mustang CTs was reasonable. In brief, the major arguments OG&E  
24 raised in favor of its Plan – such as the desirability of retiring Mustang  
25 1-4, the value of generation at the Mustang site, and the

appropriateness of new CTs to replace Mustang 1-4 – are generally plausible.<sup>3</sup>

**B. OG&E’s Decision to Use A “Direct Contracting” Approach, Rather than Engaging an EPC Contractor, May be Reasonable in this Case, but the Commission Should Recognize Risks and Rewards of EPC Contracts**

**Q. How did OG&E choose to manage the construction of the Mustang CTs?**

A. OG&E witness Robert J. Burch said “OG&E decided to directly contract for the engineering, procurement and construction and merely use a construction manager to help oversee the project. As a result of this decision, OG&E was able to manage the construction process without an EPC Contractor.”<sup>4</sup>

**Q. Please explain the difference between a “construction manager” and an Engineering, Procurement and Construction contractor.**

A. In responding to the 34<sup>th</sup> Question of the AG’s 1<sup>st</sup> Data Request, OG&E distinguished between the two entities by saying:

An EPC contractor is an entity that offers engineering, procurement and construction services to execute an agreed upon scope of work. *This work is typically executed on a fixed price basis with the contractor including in their pricing funds to cover risk, contingency and their fees and overhead. These items are paid to the EPC contractor, regardless if actual costs for those items are less than expected.*

<sup>3</sup> This general observation should not be taken as an endorsement of every aspect of OG&E’s application, testimony and workpapers.

<sup>4</sup> Direct Testimony of Robert J. Burch, 19:28-20:1.

1 A construction manager is an entity that has experienced  
2 resources and a proven track record in management of  
3 contractors and construction activities on a project. This  
4 includes assisting the Owner in contract negotiation and  
5 issue resolution. *A construction manager typically*  
6 *performs that service for a fee (fixed or time and material)*  
7 *under the direction of the Owner. Their price does not*  
8 *include risk or contingency.*<sup>5</sup>  
9

10 **Q. What is the key difference between the “direct contracting”**  
11 **and “EPC” approaches to managing a construction project that**  
12 **concerns you?**

13 A. One key difference between the two approaches – and the one I am  
14 calling to the Commission’s attention – is their different allocations of  
15 risks and costs. Specifically, EPC contractors assume certain risks as  
16 to the project, including the project’s final cost, but presumably  
17 increase the price of their services in order to provide such risk  
18 mitigation services. The quoted portions of OG&E’s response to AG 1-  
19 34 above discuss this attribute of EPC contracts. Mr. Burch also  
20 testified that:

21 Essentially, the EPC contractor takes on the risk of  
22 various cost increases and OG&E is largely insulated  
23 from that risk. However, if the EPC contractor realizes  
24 savings or reduced costs, the benefit of those cost  
25 reductions goes to the EPC contractor.<sup>6</sup>  
26

27 **Q. Why did OG&E choose to directly contract for the construction**  
28 **of the Mustang CTs instead of engaging an EPC contractor for**  
29 **the project?**

30 A. Mr. Burch testified that OG&E expected it could reduce overall project  
31 costs by forgoing an EPC contract and “was willing to take on the cost

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<sup>5</sup> Emphasis added.

<sup>6</sup> Burch Direct, 19:21-24.

1 risks itself.”<sup>7</sup> Mr. Burch also testified that OG&E has already achieved  
2 \$45 million in reduced costs using its approach.<sup>8</sup>

3 **Q. Are you questioning OG&E’s decision to use the direct**  
4 **contracting approach and forego an EPC contract for the**  
5 **Mustang CTs?**

6 A. No.

7 **Q. If you are not questioning OG&E’s decision to forego an EPC**  
8 **contract, why are you raising the issue at this time?**

9 A. My concern with OG&E’s decision regarding the management of the  
10 construction of the Mustang CTs is a general policy concern rather  
11 than a specific concern with OG&E’s decision. As noted above, EPC  
12 contracts offer some risk protection in exchange, one should expect, for  
13 a higher cost project. Decisions about whether to engage EPC  
14 contractors may thus have an impact on customers’ risks and costs;  
15 specifically, the apparently higher costs of EPC contracts might also  
16 come with protections against, for example, large cost overruns. I raise  
17 this concern in this docket to encourage the Commission to consider  
18 this matter in future cases; for example, the Commission could  
19 consider adding a requirement to its various procurement and  
20 construction oversight rules to require utilities to document their  
21 choices between direct contracting and an EPC contract for  
22 construction projects.<sup>9</sup>

23

24 **C. SPP’s Testimony Does Not Adequately Document Reliability**  
25 **Benefits of Mustang CTs**

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<sup>7</sup> *Id.*, 19:27-28.

<sup>8</sup> *Id.*, 20:6-8.

<sup>9</sup> In response to the 33<sup>rd</sup> Question of the AG’s 1<sup>st</sup> Data Request, OG&E noted that it “has no documents or materials to quantify the savings anticipated by selecting a self-perform contracting approach as compared to an EPC strategy.”



1 **Q. Did SPP provide testimony in support of OG&E's application?**

2 A. Yes. Along with the testimony of its own employees, OG&E also  
3 submitted Direct Testimony from SPP Vice-President of Engineering  
4 Lanny Nickell. Mr. Nickell testified that

5 OG&E asked that I prepare testimony to provide  
6 independent validation of those benefits by (i) discussing  
7 SPP's use of quick start CTs in its reliable operation of  
8 the transmission system and (ii) citing to recent studies  
9 that show how critical it is to have continued generation  
10 (especially quick start CTs) at the Mustang site.<sup>10</sup>  
11

12 **Q. Did Mr. Nickell's testimony fully document the issues listed**  
13 **above?**

14 A. No. To be clear, Mr. Nickell did testify extensively to the value of  
15 quick-start CTs in general and at the Mustang site in particular.  
16 However, Mr. Nickell's testimony and responses to related AG data  
17 requests did not fully document the specific reliability benefits of new  
18 CTs at the Mustang site.

19 **Q. Please explain why you say that Mr. Nickell's testimony and**  
20 **responses to data requests "did not fully document" the value**  
21 **of quick-start CTs at the Mustang plant site.**

22 A. I first note that the copy of the *2017 Variable Generation Integration*  
23 *Study* ("VIS") that Mr. Nickell provided as Exhibit LN-1 to support his  
24 testimony was incomplete;<sup>11</sup> in particular, it was missing sections 1.3  
25 (Major Findings), 1.4 (Recommendations) and 9.8 (Summary). OG&E

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<sup>10</sup> Direct Testimony of Lanny Nickell, 4:4-8.

<sup>11</sup> The VIS is first cited at 5:13-15 of Mr. Nickell's testimony and is also cited in several other passages.

1 provided the final version in response to the 51<sup>st</sup> Question of the AG's  
2 1<sup>st</sup> Data Request; this copy is attached hereto as Exhibit KDW-2.<sup>12</sup>

3 **Q. Did either version of the VIS clearly state that quick start CTs**  
4 **at the Mustang site would be valuable?**

5 A. No. As Mr. Nickell noted in response to the 44<sup>th</sup> Question of the AG's  
6 1<sup>st</sup> Data Request, provided as Exhibit KDW-3:

7 The report does not specifically state the two conclusions  
8 drawn in Mr. Nickell's testimony. These conclusions were  
9 drawn based on observations from the VIS analysis and  
10 models used for the analysis as further described herein.  
11

12 **Q. Did Mr. Nickell's explanation provided in Exhibit KDW-3**  
13 **adequately document the value of quick start CTs at the**  
14 **Mustang site?**

15 A. No. To be clear, Mr. Nickell's explanation presented in Exhibit KDW-3  
16 does summarize how the VIS report generally supported this  
17 conclusion.

18 However, I was concerned that Mr. Nickell referred to "*both* Mustang  
19 CT units" being "cycled online as power transfers increased to the 60%  
20 [wind] penetration level."<sup>13</sup> I believe the two Mustang units Mr.  
21 Nickell cited are not the new CTs OG&E is now building, but Mustang  
22 Units 5A and 5B. These two units are no longer at the Mustang plant  
23 site. OG&E stated in response to the 38<sup>th</sup> Question of the AG's 1<sup>st</sup> Data  
24 Request that these two units were relocated to the Tinker Air Force  
25 Base ("AFB") "several years ago" and that "[t]hey remain in service."<sup>14</sup>

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<sup>12</sup> I note that the latest date on the "Revision History" (p. 2) of the final VIS showed that it was last revised on February 21, 2017, almost six months before Mr. Nickell's testimony was filed.

<sup>13</sup> Emphasis added.

<sup>14</sup> See also KDW-6 - OG&E's HSPI response to the 47<sup>th</sup> Question of the AG's 1<sup>st</sup> Data Request.

1 It thus appears that Mr. Nickell may have used the dispatch of  
 2 Mustang Units 5A and 5B as evidence of the reliability benefits of new  
 3 Mustang CTs, even though those two units are no longer at the  
 4 Mustang plant site.

5 **Q. Do you think there may be a good explanation for Mr. Nickell's**  
 6 **citation of Mustang 5A and 5B as evidence of the reliability**  
 7 **benefits of the new Mustang CTs?**

8 A. Yes. It may be that the Mustang plant site and Tinker AFB are in the  
 9 same location "electrically," that is, that generation at Tinker provides  
 10 the same, or very substantially similar, reliability benefits as  
 11 generation at the Mustang plant site.

12 **Q. How could SPP resolve your concerns?**

13 A. SPP appears to be conflating the reliability benefits of the existing  
 14 Mustang site – where Units 1-4 have operated for many years and  
 15 where OG&E is installing new CTs as Units 7-12 – with those of  
 16 generation now sited at Tinker AFB, that is, Mustang Units 5A and  
 17 5B. SPP could clarify the value of generation at the Mustang site  
 18 compared to other generators.

19

20 **D. OG&E Has Not Adequately Documented Statements Regarding**  
 21 **the Increased "VAR" Capability of the New Mustang CTs**

22 **Q. What is a "VAR"?**

23 A. As explained by OG&E witness Gerald McAuley:

24 VAR stands for Volt Amps Reactive and is an important  
 25 but complicated component of the AC power system.  
 26 VARs are known as "reactive power" and are necessary in  
 27 maintaining voltage and facilitating the flow of power  
 28 across a power system. In general, when one needs to  
 29 raise voltage, VAR production is increased. When one

1 needs to lower voltage, VAR production is decreased  
2 and/or VARs are absorbed.<sup>15</sup>  
3

4 **Q. Are VARs produced by generators at the Mustang site?**

5 A. Yes. Mr. McAuley testified that the “old generating units at Mustang  
6 were capable of producing 150 MVARs” and that the “quick start CTs  
7 at the Mustang site will provide 245 MVARs of reactive capability.”<sup>16</sup>

8 **Q. Did OG&E attempt to document these statements regarding**  
9 **the MVARs produced by different generators at the Mustang**  
10 **site?**

11 A. Yes. In response to the 39<sup>th</sup> Question of the AG’s 1<sup>st</sup> Data Request,  
12 OG&E provided charts purporting to document Mr. McAuley’s above-  
13 cited statements. This response and its attachments are provided as  
14 Exhibit KDW-4. In response to the 2<sup>nd</sup> Question of the AG’s 3<sup>rd</sup> Data  
15 Request, OG&E provided help on interpreting of the charts provided in  
16 Exhibit KDW-4 and provided additional information regarding Mr.  
17 McAuley’s estimates of the new Mustang CTs’ VAR capabilities. This  
18 response is provided as Exhibit KDW-5.

19 **Q. Does the information provided in Exhibits KDW-4 and KDW-5**  
20 **document the statements regarding the Mustang units’ VAR**  
21 **capabilities in Mr. McAuley’s testimony?**

22 A. No. In Exhibit KDW-5, Mr. McAuley states that his statement that  
23 the old Mustang units can only provide 150 MVAR applies only to  
24 Mustang Unit 4 and that that Units 1-4 together could provide 298  
25 MVAR. But he also states that the new Mustang CTs would produce  
26 286 MVAR, that is, approximately 12 MVAR less than Mustang Units

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<sup>15</sup> Direct Testimony of Gerald McAuley, 8:5-9.

<sup>16</sup> McAuley Direct, 8:28-9:5. I understand the “M” in “MVARs” stands for “mega” or “million,” such that the unit MVARs refers to a million VARs.

1           1-4.<sup>17</sup> These data responses are not consistent with Mr. McAuley's  
2           above-cited statement that the new Mustang CTs would provide more  
3           VARs than Mustang Units 1-4. OG&E should clarify the increased  
4           VAR production, if any, attributable to the new Mustang CTs.

5   **Q.   Does this conclude your testimony?**

6   A.   Yes. Thank you.

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<sup>17</sup> OG&E notes in Exhibit KDW-5 that output to the "BES" (which I believe stands for "bulk electrical system") from Mustang Units 1-4 would be lower due to other equipment and system limitations and that studies need to be completed to estimate the new Mustang CTs' ability to deliver MVARs to the BES.

Respectfully submitted,

LESLIE RUTLEDGE  
Attorney General

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**CERTIFICATE OF SERVICE**

I, M. Shawn McMurray, do hereby certify that on the 15<sup>th</sup> day of November, 2017, I provided a copy of the above and foregoing to the parties to be served in this docket.

/s/ M. Shawn McMurray  
M. Shawn McMurray