

BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF)
OKLAHOMA GAS AND ELECTRIC COMPANY)
FOR COMMISSION AUTHORIZATION OF A)
PLAN TO COMPLY WITH THE FEDERAL CLEAN)
AIR ACT AND COST RECOVERY; AND FOR)
APPROVAL OF THE MUSTANG MODERNIZATION)
AND COST RECOVERY)

CAUSE NO. PUD 201400229

FILED
JAN 26 2015

COURT CLERK'S OFFICE - OKC
CORPORATION COMMISSION
OF OKLAHOMA

REDACTED

Rebuttal Testimony

of

Leon Howell

on behalf of

Oklahoma Gas and Electric Company

January 26, 2015

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

I. INTRODUCTION

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

A. My name is Leon Howell. I am employed by Oklahoma Gas and Electric Company ("OG&E" or "Company") and my business address is 321 N. Harvey, Oklahoma City, Oklahoma 73102.

Q. **Did you previously file Direct Testimony in this proceeding?**

A. Yes.

Q. **Have you reviewed the Responsive Testimony filed in this cause?**

A. Yes.

Q. **What will your rebuttal testimony address?**

A. In this rebuttal testimony I will respond to portions of the responsive testimony of Craig Roach, who is testifying on behalf of the Oklahoma Corporation Commission Public Utility Division; Scott Norwood, who is testifying on behalf of the Oklahoma Industrial Energy Consumers; Daniel Peaco, who is testifying on behalf of the Oklahoma Cogeneration; Judah Rose, who is testifying on behalf of the Oklahoma Energy Results, LLC and; Tyler Comings, Jeremy Fisher, Jennifer Tripp and Rachel Wilson, who are testifying on behalf of the Sierra Club. Specifically, I will be responding to each of these witnesses with respect to OG&E's environmental compliance plan and Mustang modernization plan.

Q. **Please summarize your rebuttal testimony.**

A. First, I will address statements made by intervenor witnesses concerning OG&E's environmental compliance plan. I will also address certain criticisms of the 2014 IRP Update assumptions and process, which OG&E relied on in part to support its decision to choose the Scrub/Convert environmental compliance plan. Secondly, I will respond to

1 views expressed by intervenor witnesses concerning OG&E's plan to replace capacity
2 currently being provided by the Mustang Generating units.

3
4 Environmental Compliance Plan Analysis

5 Q. **First, I want to ask you to address the Responsive Testimony of Craig Roach as it**
6 **pertains to OG&E's environmental compliance plan. Does Dr. Roach disagree with**
7 **OG&E's choice of the Scrub/Convert environmental compliance plan?**

8 A. No, Dr. Roach recommends on page 65, lines 7-8, approval of OG&E's plan because
9 "this alternative appropriately offers a diversified portfolio of action in the face of
10 uncertainties."

11
12 Q. **So, if Dr. Roach agrees with OG&E's environmental compliance plan what is your**
13 **concern with his conclusions?**

14 A. Even though Dr. Roach agreed with the end result of OG&E's decision to choose the
15 Scrub/Convert as the best alternative to comply with environmental regulations, he
16 argues on page 30, line 14 of his Responsive Testimony: "OG&E's evaluation process is
17 not sufficient to support its compliance plan." On page 30, line 17 of his Responsive
18 Testimony, he says: "OG&E has provided an incomplete record for the Commission."
19 While Dr. Roach reaches the same overall conclusion as OG&E, he cites his concerns as
20 support for potentially denying OG&E's ability to recover prudently incurred costs
21 associated with OG&E's environmental plan.

22
23 Q. **Do you agree with Dr. Roach that OG&E has provided an incomplete record?**

24 A. No. I will address each of Dr. Roach's concerns and explain how we addressed those
25 issues in the IRP.

26
27 Q. **What is Dr. Roach's first concern in his Responsive Testimony?**

28 A. In his Responsive Testimony on page 31, line 10, Dr. Roach states "OG&E has not
29 assessed existing capacity as an option." Essentially Dr. Roach argues that OG&E
30 should have evaluated the purchase of existing capacity instead of retrofitting or
31 converting the Regional Haze affected coal units.

1 Q. **Did OG&E assess the viability of existing capacity as an option?**

2 A. Yes. OG&E concluded that existing capacity that theoretically might be available in the
3 region would not be available at a competitive cost to OG&E and/or would not be
4 available when needed by OG&E to satisfy its capacity obligations. This issue was
5 addressed on page 48 of OG&E's 2014 IRP Update that discusses OG&E's analysis of
6 the acquisition of an existing 500 MW combined-cycle plant as an alternative to the
7 conversion of a Muskogee unit. OG&E further explained this option in response to OCC
8 data request 2-2, which response shows each step of the analysis in which a converted
9 Muskogee unit (return on rate base, expenses and production cost with market impact) is
10 replaced with an existing combined cycle plant purchased at \$250/kW (plus expenses and
11 production cost with market impact). The resulting portfolio cost is higher than OG&E's
12 Scrub/Convert plan. Therefore, the price to beat for an existing resource to offer savings
13 over the converted Muskogee unit in this analysis is below \$250/kW, well below the
14 \$450/kW to \$█/kW costs that OG&E believes to be the market value of existing natural
15 gas combined cycle generation capacity.

16
17 Q. **Did OG&E perform a similar analysis to determine the price to beat for the
18 addition of a scrubber on a Sooner unit?**

19 A. Yes, OG&E performed a similar analysis to calculate the price to beat at which the
20 purchase of an existing unit would be a better alternative than adding a scrubber on a
21 Sooner unit. The price to beat was \$125/kW, which was well below the \$450/kW to
22 \$█/kW costs OG&E believes to be the market value of existing capacity.

23
24 Q. **How does the purchase plant analysis relate to a Purchase Power Agreement (PPA)
25 analysis?**

26 A. A long-term PPA is an alternative to acquiring a plant. PPAs can be structured to include
27 energy and/or capacity and they can be short-term contracts for a year or two or long-
28 term contracts that can last for the duration of an asset's life. Short-term PPAs do not
29 address the long-term capacity needs shown in OG&E's 2014 IRP Update. Long-term
30 PPAs require the seller to recover the costs of the plant through the charges to the buyer.
31 In other words, in a rational market, long-term contracts should be reflective of the cost

1 of purchasing an existing plant which, as discussed above, is not a cost effective
2 alternative for OG&E.

3
4 **Q. Does OG&E need to do a RFP to determine the market value of existing capacity?**

5 A. No. We monitor all transactions in the SPP and neighboring markets in order to keep
6 abreast of the value of capacity. Also, we periodically meet with representatives of
7 independent power producers and discuss opportunities that may be available. For
8 example, OG&E received an unsolicited offer from an independent power producer for
9 the purchase of an approximately 13 year old natural gas combined cycle generation plant
10 for \$█/kW. The price at which they were willing to sell their unit was comparable to
11 the price for which other existing natural gas combined cycle capacity of the same
12 vintage had recently sold in the market. This confirmed OG&E's understanding of
13 market prices for existing natural gas combined cycle capacity. While it may have been
14 possible to achieve a lower price through negotiation, the likely outcome would still have
15 far exceeded the cost of OG&E's alternative.

16
17 **Q. In Dr. Roach's testimony on page 33, line 10, he states "Two entities, J-Power and
18 LS Power, said they had a significant amount of capacity and energy available to
19 market in the 2018 timeframe." Did OG&E consider solicititing offers from these
20 or other plant owners?**

21 A. Yes. OG&E met with J-Power on October 16, 2013 and was informed that J-Power had
22 an existing 20-year agreement with Exelon for the entire capacity from their Green
23 Country plant. The agreement lasts until 2022 but J-Power was willing to offer a PPA
24 beginning after their agreement with Exelon ended in 2022. They did not mention the
25 potential that the facility could be expanded to provide the capacity and energy and be
26 available in the 2018 timeframe as suggested in footnote 58 on page 33 of Dr. Roach's
27 testimony. OG&E considered a replace option in its IRP that compared a new combined
28 cycle as an alternative in its environmental compliance plan and found that alternative to
29 be a much higher cost.

30 It is worth noting that LS Power purchased the approximately 12 year old Oneta
31 plant from Calpine on July 3, 2014 along with five other plants (Carville Energy Center

1 in Louisiana; Hog Bayou Energy Center and Decatur Energy Center, both in Alabama;
2 Columbia Energy Center in South Carolina and Santa Rosa Energy Center in Florida) for
3 approximately \$450/kW, which also is well above the price to beat in the IRP.
4

5 **Q. Please address the second concern from Dr. Roach's Responsive Testimony.**

6 A. Dr. Roach claims in his testimony on page 34, Lines 9-10, that OG&E "does not fully
7 analyze the risk of new environmental regulation that could shut down its newly
8 retrofitted coal plants." I disagree with the assessment. OG&E studied the impact of
9 CO₂ regulation through both scenario and sensitivity analyses and incorporated it into the
10 economic analysis. Since OG&E will in essence retire 1000 MW or 40% of its coal fleet
11 in its Environmental Compliance Plan, OG&E will provide a meaningful contribution to
12 the State of Oklahoma's compliance with any CO₂ regulation such as the Clean Power
13 Plan rule if it were to occur.

14 Other intervening parties fault OG&E for not including CO₂ costs in the base case
15 scenario or other "proxy costs" for other proposed regulations in the economic modeling.
16 The base case is a set of assumptions that OG&E feels best represents the most likely
17 future facing the Company. Future regulations that have not been finalized should not be
18 included in the base case or in the economic model. There is simply too much inherent
19 uncertainty associated with the regulatory process to quantify costs associated with those
20 rules and put them into an economic analysis. OG&E Witness Turner provides several
21 examples of how final rules turned out very differently from their proposed versions.
22

23 **Q. Why is it not appropriate to include CO₂ costs in the base case in particular?**

24 A. First, it is OG&E's view that including CO₂ costs in the base case would be, in effect,
25 double counting the cost of compliance. Two of OG&E's three scenarios, including its
26 base case, already assume coal unit retirements due to SPP members being required to
27 control emissions (including CO₂) on their coal units. Second, OG&E did not account for
28 CO₂ costs in the base case due to the inherent uncertainty in the outcome of the proposed
29 Clean Power Plan ("CPP") rule. EPA has received over 3.7 million comments on the
30 CPP and has already announced a delay in the final rule. OG&E expects that the final
31 rule will be subject to judicial scrutiny as well. The final reason CO₂ costs are not

1 appropriate for inclusion in the base case is that the ultimate regulation, if there is one,
2 may not require any reductions from the scrubbed Sooner units at all or may not require
3 OG&E to take any further action beyond the Scrub/Convert plan to comply with the
4 proposed rule.

5
6 **Q. Why would this proposed regulation, if finalized, potentially not require emissions**
7 **reductions from the Sooner facility?**

8 **A.** As explained by Witness Turner, EPA's proposed CPP seeks to make a 43% reduction in
9 the emissions rate (lb/MWh) of CO₂ (or mass equivalent annual cap i.e. tons) from *all*
10 existing electric utilities in Oklahoma by 2030. OG&E's Scrub/Convert Plan will
11 convert 40 percent of its coal generation fleet to natural gas. OG&E's modeling projects
12 that the Scrub/Convert Plan will reduce the tons of CO₂ emissions by 43 percent by 2030
13 as compared to the baseline year of 2012. These CO₂ emission reductions are significant
14 and position OG&E to provide a meaningful contribution to any state CO₂ reduction
15 target that is ultimately required by EPA.

16 Moreover, under the proposed CPP, the Oklahoma Department of Environmental
17 Quality (ODEQ) will determine, after an assessment of affected sources, what emissions
18 reductions measures are to be required in order to meet the state's limit. The proposed
19 rule allows states flexibility in compliance options with the requirements of the rule, *i.e.*,
20 emissions rate or emissions tonnage cap. The rule does not specify a specific emission
21 rate to be applied to each facility, does not require compliance with the state rate as
22 applied to each source individually, and certainly does not require reductions from all
23 coal units. In addition, the proposed rule would currently allow the state to utilize
24 increases in energy efficiency and renewable energy to count as CO₂ reductions, but it is
25 unclear how those energy efficiency or renewable energy credits could be used to comply
26 with the CO₂ targeted reductions.

27 OG&E's Scrub/Convert plan will provide the State of Oklahoma with a head start
28 towards meeting the mandated targets contained in the proposed CPP. The flexibility
29 given to the State coupled with the announced coal plant retirements of PSO and Grand
30 River Dam Authority makes any additional action by OG&E extremely uncertain. As
31 explained by Witness Turner, it is not likely that OG&E will be required to make any

1 additional reductions in CO₂ emissions at the scrubbed Sooner units in order for the state
2 to meet its proposed targets. This is a primary reason why adding a carbon tax or cost on
3 top of the Scrub/Convert plan in the base case overestimates the impact that the proposed
4 rule could have on OG&E.

5
6 **Q. Dr. Roach, on pages 34-36 of his testimony, uses four studies to illustrate the**
7 **“substantial risk of retirement.” Do you believe these studies support additional**
8 **risk of retirements beyond OG&E’s environmental compliance plan?**

9 A. No, these studies do not support additional risks of retirements for OG&E. The GAO and
10 EIA studies are national studies that made broad assumptions about retirements in the
11 industry in general. As reported by Dr. Roach, the GAO study assumes that power
12 companies retired or plan to retire about 13% of the total coal capacity in the country
13 through 2025. The EIA’s Annual Energy Outlook 2014 assumed about 20% of coal
14 capacity may retire by 2025. These assumptions have nothing to do with the particular
15 environmental compliance dynamics of OG&E and its facilities.

16 The other two studies referenced by Dr. Roach, the SPP and MISO studies, are
17 reliability studies of the EPA Clean Power Plan (“CPP”). SPP and MISO did not make
18 any independent assumptions about the retirement of coal plants. They only used the
19 EPA projections contained in the CPP. These reliability studies do not support the risk of
20 additional retirements any more than the EPA’s CPP.

21
22 **Q. What other concerns did witnesses express on CO₂ modeling?**

23 A. Witness Fisher on page 12, lines 12-13 state that, in previous IRPs, “OG&E’s judgment
24 that it was necessary to seriously account for carbon dioxide regulatory risk was
25 consistent with the practice of many other utilities.” Then Fisher alleges on page 13,
26 lines 12-13 in OG&E’s 2014 IRP Update “OG&E is willing to dismiss a risk considered
27 imminently transformative by other utilities.” The truth is OG&E continues to take CO₂
28 risk very seriously, as should be evident by the fact that two of the three scenarios assume
29 coal units in the SPP will be converted to natural gas due to emission regulations and an
30 additional sensitivity assuming a CO₂ cost was included in its analysis. Also, the results

1 of this CO₂ risk analysis were a major factor in OG&E's decision to convert to natural
2 gas two of the four coal units impacted by Regional Haze and MATS.
3

4 **Q. What was the third concern from Dr. Roach's Responsive Testimony?**

5 A. Dr. Roach on page 37, line 10, of his testimony claims OG&E "has not fully analyzed
6 sensitivities of its own load."
7

8 **Q. Did OG&E appropriately consider changes to load in its sensitivity analysis?**

9 A. Yes. In its 2014 IRP Update, OG&E considered as a sensitivity, a 10% energy
10 requirement reduction across the entire SPP. For this sensitivity, OG&E assumed a 10%
11 energy reduction for every member of the SPP, including OG&E, to determine the
12 market price impacts. The impact to OG&E's environmental alternatives is presented
13 graphically on page 47 of the IRP.
14

15 **Q. Dr. Roach states in his testimony on page 38, lines 3-4, "lower load could obviate the
16 need for, say, converted capacity at Muskogee." Is this a reasonable application of a
17 sensitivity analysis?**

18 A. No. While sensitivity analyses are useful to identify the sensitivity of results to key input
19 variables that are subject to uncertainty, it would not be appropriate for OG&E to propose
20 an environmental compliance plan that assumes that energy (or capacity) would be 10%
21 lower than in the base case. The reason is obvious. If OG&E were to plan as if load
22 would be lower by 10%, and this assumption turned out to be false, then OG&E would be
23 short capacity. Thus, eliminating capacity based on a low load case would introduce
24 considerable reliability risk to OG&E's future generation portfolio. The more relevant
25 question is whether OG&E would have the ability to economically respond should load
26 fall far short of the base case assumption. In response to this question, OG&E has the
27 flexibility of not replacing the capacity reduction due to PPAs coming to term and/or the
28 planned retirement of the Horseshoe Lake 6 unit.
29

1 Q. **Dr. Roach states in his testimony on page 38, lines 4-5, “Or higher load might have**
2 **tipped the scale in favor of replacement with combined cycle.” Is it reasonable to**
3 **draw that conclusion?**

4 A. No. Higher load across SPP would lead to high SPP market prices in relation to the base
5 case. As shown in Table 20 on page 46 of the 2014 IRP Update, the compliance
6 alternatives that include replacement of existing capacity with combined cycle units are
7 among the most expensive alternatives in all cases, including the cases with high SPP
8 market prices. None of the scenarios or sensitivity analyses resulted in the Scrub/Replace
9 or Replace alternatives being competitive with converting or scrubbing. In my opinion,
10 there is no credible change in load that could make the Scrub/Replace or Replace
11 alternatives competitive with the other alternatives.
12

13 Q. **Has OG&E experienced drastic load growth changes in the past?**

14 A. No, historically OG&E’s demand has been relatively constant in its load growth with
15 load growth averaging about 1% to 2% annually for both peak demand and energy.

16 Recently, however, the annual load growth has slowed to the lower side of that
17 range largely due to efficiency standards set by the Federal government for residential
18 and commercial items such as lighting, air conditioners, household appliances,
19 equipment, etc. Also, OG&E has further reduced its load growth by offering customers
20 energy efficiency and demand response programs and will continue to offer these
21 programs in the future.

22 Since load growth has been predictable in the past, OG&E does not have reason
23 to believe that it will change dramatically in the future. OG&E expects any changes to
24 load growth will come gradually and we would have adequate time to respond.
25

26 Q. **Please address the fourth concern from Dr. Roach’s Responsive Testimony.**

27 A. Dr. Roach on page 38, line 13 of his testimony states “sensitivity analyses vary just one
28 input at a time. We are concerned that such analyses are too simplistic.”

29 Sensitivity analysis is typically used to test the sensitivity of the results to a single
30 source of uncertainty. This contrasts with scenario analyses that can be thought of as
31 performing multiple sensitivity analysis at the same time. Sensitivity analysis is simple

1 on purpose so one can easily determine the impact of one specific input variable on the
2 output results. It is not meant to predict what will happen in the future, only to identify
3 the relationships between input variables on the output results.
4

5 **Q. Please summarize the fifth concern from Dr. Roach's Responsive Testimony.**

6 A. Dr. Roach, beginning at page 41 of his testimony, claims that OG&E relies on "possibly
7 optimistic forecasts of SPP energy market prices." He explains further on pages 41-44
8 that market prices are not high enough to justify the building of new combined cycle
9 units in the SPP IM. Dr. Roach then concludes that market prices are too low in OG&E's
10 analysis, which makes converting Muskogee more favorable.
11

12 **Q. Do you agree with Dr. Roach's assessment?**

13 A. No. Unlike some other RTOs, the SPP has a capacity requirement as explained in my
14 Direct Testimony. Therefore, to conclude that capacity would have to be profitable to
15 support the construction is missing the SPP capacity requirement. In the SPP, thermal
16 generation units like combined cycle plant or combustion turbines are not built based on
17 whether market prices support the investment. These units are installed to meet
18 individual company's planning capacity requirements as specified by the SPP.
19

20 **Q. Please summarize your testimony with regard to Dr. Roach's alleged five**
21 **"deficiencies."**

22 A. In summary, Dr. Roach's "deficiencies," considered either individually or collectively, do
23 not introduce serious concerns with respect to OG&E's methodology, assumptions or
24 results. Moreover, Dr. Roach reaches the identical conclusion that OG&E does: that the
25 Scrub/Convert alternative is the best option. Given this, these alleged deficiencies do not
26 form the basis for a disallowance of any prudently incurred costs required to implement
27 the Scrub/Convert environmental compliance plan.

28 **Q. Were there any other IRP modeling analysis issues raised by witnesses?**

29 A. Yes. Sierra Club Witness Wilson faults OG&E for not using a capacity expansion model.
30 On page 6, lines 12-15 she states "A capacity expansion model would screen these

1 different resource options and determine the resource plan that would meet
2 environmental and capacity constraints at the lowest cost over a specified period of time.”
3 Sierra Club Witness Comings on page 4, line 25 states “The Company’s modeling
4 methodology is fundamentally flawed since the Company did not conduct capacity
5 expansion modeling.” Also, Sierra Club Witness Fisher states on page 4, line 15 “a
6 capacity expansion model could have significantly changed the outcome of the
7 Company’s analysis.”
8

9 **Q. Please explain why OG&E did not use a capacity expansion model.**

10 A. OG&E does not believe the use of a capacity expansion model would improve its IRP
11 process or the results of the process. A capacity expansion model is useful for screening
12 a large number of options that may be available to a utility to fill its capacity needs.
13 OG&E does not have a large number of options available to meet capacity needs related
14 to the Environmental Compliance Plan.

15 Listed on page 30 of OG&E’s 2014 IRP Update are the capacity resource
16 technologies that were considered as options. Using OG&E’s screening process, as
17 explained on pages 30 to 32 of OG&E’s 2014 IRP Update, these capacity options are
18 easily narrowed down to various natural gas units and central station solar. Natural gas
19 options available include natural gas combined cycle units and natural gas combustion
20 turbines. As an option for future resource needs that begin in 2020, OG&E chose to limit
21 the options to natural gas combined cycle generation for comparison purposes so all the
22 environmental alternatives considered would be analyzed with the same future resources.
23 It is OG&E’s belief this put the analysis on an apples to apples type comparison. In
24 addition, OG&E is making no decision on future resources needs beyond 2019 in its IRP.
25

26 **Q. What other testimonies would you like to address that pertain to OG&E’s choice of
27 the Scrub/Convert environmental compliance plan?**

28 A. Several of the witnesses infer that a combination of natural gas generation and wind
29 generation would be a better alternative than scrubbing or converting our existing coal
30 units. Specifically Witness Judah Rose in his testimony on page 58, lines 2-4 states “our
31 ICF analysis which follows show natural gas capacity and PTC qualified wind to be a

1 'superior' option based on potential savings and wind and natural gas capacity
2 availability.”

3
4 **Q. Do you agree that a combination of natural gas capacity and PTC qualified wind is**
5 **a “superior” option to any of the environmental compliance alternatives?**

6 **A.** No. As explained when analyzing resources, each resource should be considered as an
7 independent decision. While it is true that wind generation needs fossil fuel generation to
8 back up the intermittent nature of wind for grid reliability or operational purposes, fossil
9 fuel generation does not benefit from wind generation.

10 As explained in its analysis, OG&E considered an alternative of replacing its coal
11 units with natural gas combined cycle generation in lieu of either scrubbing or converting
12 the units. Replacing its coal units with natural gas combined cycle generation was by far
13 the highest cost alternative OG&E considered.

14
15 **Q. Did OG&E consider wind as an environmental compliance plan alternative?**

16 **A.** Yes. As stated in my Direct Testimony, wind generation does not serve as an effective
17 resource to address the planning capacity needs in OG&E’s environmental compliance
18 plan.

19
20 **Q. In testimony of witness Jennifer Tripp page 34, line 21, she has a section titled**
21 **“OG&E underestimates the value of wind from a capacity perspective.” Do you**
22 **agree with Ms. Tripp’s claim?**

23 **A.** No. Ms. Tripp relies on Table 3 on page 36 of her testimony to make this conclusion. By
24 her own admission on page 35 of her testimony she states “I do not have access to actual
25 hourly output for individual wind plant.” Also, Table 3 utilizes data from the SPP system
26 in aggregate, even though Ms. Tripp correctly states in her testimony on page 35, line 3
27 that wind capacity is accredited “on a project-by-project basis”. Table 3 also incorrectly
28 uses only one year of data.

1 Q. Does OG&E use the correct SPP accreditation process to determine the capacity
2 value of wind?

3 A. Yes. Using the most recent SPP accreditation process along with the most recent 10
4 years of actual data, the average value of wind capacity that OG&E is allowed to use is
5 6.1% of the nameplate capacity, as shown in Figure 1. This value has increased slightly
6 due to the new SPP criteria but continues be very close to the “approximately 5% of the
7 nameplate” value reported in my Direct Testimony.

Figure 1

Name	Nameplate Capacity	Accredited Capacity	Percent of Nameplate
Centennial	120 MW	16.0 MW	13.3%
Cowboy	60 MW	5.2 MW	8.7%
Crossroads	228 MW	10.0 MW	4.4%
Keenan	152 MW	9.0 MW	5.9%
Sooner Wind	50 MW	4.0 MW	8.0%
Spirit	101 MW	5.0 MW	4.9%
Taloga	130 MW	2.0 MW	1.5%
Total	841 MW	51.2 MW	6.1%

8 Q. In your Direct Testimony, you expressed a concern that the addition of new wind
9 generation may cause increased congestion. Have there been new facilities installed
10 since then?

11 A. Yes. Several have been installed, including the Mammoth Plains (200 MW) and Seiling
12 (200 MW) facilities that were both brought on line in November 2014. These facilities
13 are located near OG&E’s Crossroads (227 MW) facility and, like Crossroads, are
14 electrically connected to OG&E’s Windspeed (Woodward to Northwest) 345 kV
15 transmission line.
16

17 Q. In Direct Testimony, you stated transmission lines are under construction that may
18 relieve congestion. Have there been new facilities installed since then?

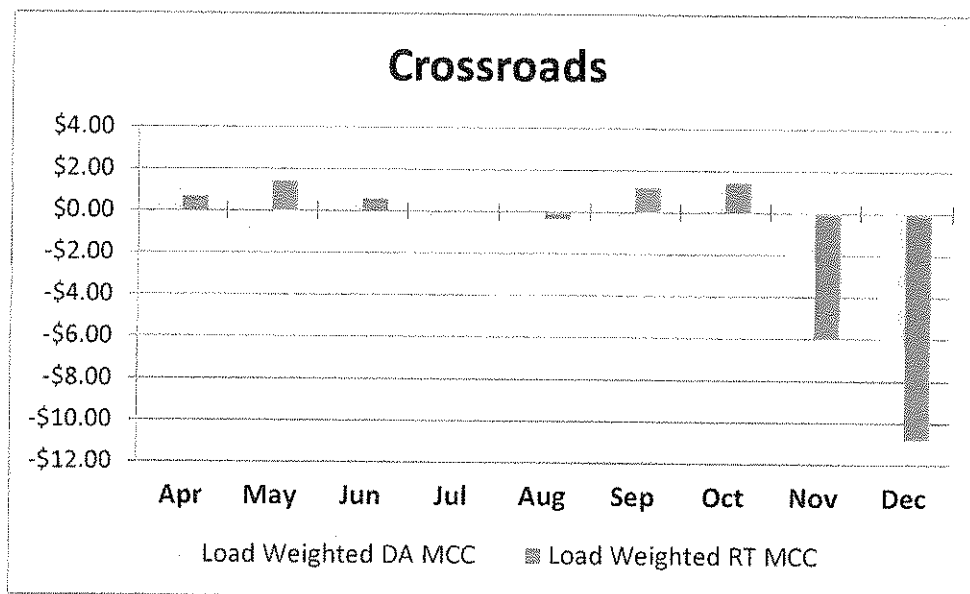
19 A. Yes. Three new transmission lines that connect at Woodward and wind generation
20 facilities have been brought on line. In particular the Hitchland-Woodward 345 kV
21 double circuit line was brought on line in May 2014, the Woodward-Tuco 345 kV line

1 was brought on line in September 2014 and the Woodward-Thistle 345 kV double circuit
2 line was brought on line in October 2014.

3
4 Q. **Has OG&E seen an increase in congestion costs that you are concerned about?**

5 A. Yes, in particular at the Crossroads wind generation facility (Crossroads). Since the
6 Mammoth Plains and Seiling windfarms have come on line, we have seen a considerable
7 increase in marginal congestion charges at Crossroads. See Figure 2 for the Crossroads
8 monthly average generation-weighted marginal congestion cost (MCC) for both day
9 ahead and real time.

Figure 2



10 Q. **Does increased congestion impact the price OG&E is paid by SPP for Crossroads
11 output?**

12 A. Yes. Referencing Figure 2, in October the day-ahead weighted average congestion
13 charges at Crossroads was a credit to OG&E customers of \$1.06/MWH whereas in
14 December the day-ahead weighted average congestion charges at Crossroads were a cost
15 to OG&E customers of \$6.49/MWH. Also, referencing Figure 2, in October the real-time
16 weighted average congestion charges at Crossroads were a credit to OG&E customers of
17 \$1.48/MWH whereas in December the real-time weighted average congestion charges at
18 Crossroads were a cost to OG&E customers of \$10.82/MWH. What that means to

1 customers is less saving from Crossroads wind generation because of increased
2 congestion.

3
4 **Q. How does the congestion charge impact the customer costs?**

5 A. Customers' costs for Crossroads in December alone increased between \$425,000 and
6 \$693,000 due to the change in congestion charges at Crossroads from October to
7 December. I calculated this by multiplying the change in congestion cost in the day-
8 ahead of \$7.55/MWH and the change in congestion cost in the real time of \$12.30/MWH
9 times the December Crossroads production of 56,349 MWHs.

10
11 **Q. Does the change in congestion costs confirm your concerns?**

12 A. It would not be appropriate to make any conclusion based on one or two months' worth
13 of SPP congestion costs, but, if this pattern continues, it will confirm my concerns.

14
15 **Q. Doesn't OG&E have Network Integrated Transmission Service or "firm" service at
16 Crossroads?**

17 A. Yes, OG&E does have firm service at Crossroads, but the energy output of the facility is
18 still susceptible to congestion charges. OG&E continues to be concerned that congestion
19 charges may increase as more facilities are developed.

20
21 Mustang Modernization Plan

22 **Q. Did the Responsive Testimony of Dr. Roach address OG&E's Mustang
23 Modernization Plan?**

24 A. On page 45, line 3 of Responsive Testimony of Craig Roach, PUD Staff Witness Roach
25 argues, "OG&E failed to assess reasonable alternatives to its plan for the Mustang site."
26 On line 6 of the same page, Dr. Roach also states, "[OG&E] never fully evaluated
27 combined cycle units."

1 Q. **Did OG&E assess reasonable alternatives to its plan for the Mustang site, including**
2 **evaluation of combined cycle units?**

3 A. Yes. Figure 12 on page 43 of OG&E's 2014 IRP Update reflects the 30 year Net Present
4 Value of Customer Cost analysis OG&E conducted comparing the installation of
5 combustion turbine units (CT and Spread CT cases) and combined cycle units (CC case)
6 as replacement for existing Mustang units. OG&E chose CT units for the Mustang site
7 because, as shown in Figure 12 and stated on page 43, it was the least cost option.
8

9 Q. **When OG&E retires the Mustang units, does the Mustang capacity need to be**
10 **replaced?**

11 A. Yes. Table 17 on page 39 of OG&E's 2014 IRP Update shows that the retirement of the
12 existing Mustang units creates a capacity need. The capacity being retired at Mustang
13 must be replaced in order for OG&E to comply with the 12% SPP capacity margin
14 requirement.
15

16 Q. **What other concerns about the Mustang Modernization Plan have been mentioned**
17 **by Intervenors?**

18 A. The responsive testimonies of Judah Rose (page 53, line 16), Scott Norwood (page 33,
19 lines 12-23) and Daniel Peaco (page 15, lines 3-8) question OG&E's decision to site
20 replacement CT unit generation at the Mustang Plant location.
21

22 Q. **In response to these concerns, please describe the fundamental reasons for replacing**
23 **the Mustang units with combustion turbine units at the same site.**

24 A. First, as detailed in the Rebuttal Testimony of Greg McAuley, the Mustang site plays an
25 important role in ensuring reliability on the transmission grid in and around the
26 Oklahoma City area. Page 20 of the 2014 IRP Update lists reliability as the first
27 objective guiding OG&E's decision-making process. OG&E continues to place a very
28 high priority on reliability for its customers.

29 Second, not only is generation at the Mustang site important, but Witness
30 McAuley explains why adding CTs at Mustang provides additional reliability benefits for
31 customers. Studies conducted by SPP have also highlighted the importance of new CT

1 generation units to the SPP system. The 2013 SPP ITP20¹ indicates CTs support wind
2 development by saying, “[t]he quick-start CT units are able to ramp up quickly when
3 wind speeds decrease.” The 2015 SPP ITP10² projects significantly more CT capacity
4 installed across SPP over the next decade and states, “[t]he CT units are generally
5 included because the very low capital costs associated with these units make them the
6 most economically viable technology for meeting peak capacity requirements.”

7 Third, as pointed out on page 28 of the 2014 IRP Update, “OG&E also
8 determined that no CTs are available for acquisition in the region.” OG&E maintains a
9 general knowledge of resources in the region and the ownership status of those resources.
10 To OG&E’s knowledge, no CTs are available for acquisition in the SPP RTO region.

11 Fourth, as explained by Witnesses Burch and Turner, OG&E can take advantage
12 of the existing infrastructure and permits at the existing Mustang site. Not only does the
13 use of the Mustang site provide cost savings in the development of generation, but the
14 existing permits can be used to site the new CTs with netting.

15 Finally, as explained by Witness Burch, OG&E has determined that it cannot use
16 netting to site a combined cycle facility at the Mustang Plant location. To do so would
17 require OG&E to accept a very low capacity factor, which would be inconsistent with the
18 desired operations of a combined cycle unit.

19
20 Q. **Does this conclude your prepared rebuttal testimony?**

21 A. Yes, it does.

¹ http://www.spp.org/publications/20130730_2013_ITP20_Report_clean.pdf

² <http://www.spp.org/publications/Final%202015%20ITP10%20Report.zip>