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BEFORE THE CORPORATION COMMISSION OF OKLAHOMA FEB 20 2015

**COURT CLERK'S OFFICE - OKC
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) CAUSE NO. PUD 201400229
AIR ACT AND COST RECOVERY; AND FOR)
APPROVAL OF THE MUSTANG MODERNIZATION)
AND COST RECOVERY)

TESTIMONY SUMMARY

CRAIG R. ROACH, Ph.D., ON BEHALF OF THE OKLAHOMA CORPORATION
COMMISSION PUBLIC UTILITY DIVISION

The purpose of my Testimony is to report on my review of Oklahoma Gas and Electric's ("OG&E's") application for (a) authorization of and cost recovery for its "Environmental Compliance Plan" (ECP) to comply with Federal Clean Air Act regulations and (b) authorization of and cost recovery for its separate "Mustang Modernization Plan" (MMP), which seeks to replace existing units at OG&E's Mustang power facility site. The total capital cost associated with OG&E's application is over \$1 billion through 2019. This does not include further potential increases in ratepayer costs from, for example, increased purchases of energy from the Southwest Power Pool (SPP_ energy market.

My recommendation as to OG&E's request regarding its ECP is that the Commission place specific conditions on OG&E's cost recovery. That is, the Commission should substantially approve the ECP with a number of conditions to limit ratepayer risk. These conditions stem from the fact that OG&E did not vet its ECP against the market by conducting RFPs or by fully analyzing all risks, as discussed in the remainder of this summary.

My recommendation as to OG&E's request regarding its MMP is that the Commission not approve cost recovery. "Having reviewed the Mustang modernization plan, I find that OG&E's assessment of that Plan is incomplete."¹ OG&E has not demonstrated that there is a need to upgrade its units at the Mustang site or that there is a need for OG&E to construct combustion turbines at that site instead of conducting a competitive procurement.

OG&E'S ENVIRONMENTAL COMPLIANCE PLAN

The remainder of this summary of my testimony describes (a) the backdrop for this Cause, (b) OG&E's ECP and the analysis it did in support of that plan, (c) my testimony regarding wind generation, which OG&E did not analyze, (d) my recommendations regarding the ECP, including specific recommendations on OG&E's rate proposal, and (e) my recommendations on OG&E's MMP.

The backdrop for this Cause is that OG&E had to propose efforts to comply with two major environmental rules under the Federal Clean Air Act: the Regional Haze Rule ("RHR") and the Mercury and Air Toxics Standards ("MATS"). "The actions most likely to be at the core of this proceeding are those directed at complying with the sulfur dioxide emissions standard under the RHR."² These actions have a compliance deadline of January 4, 2019, while other aspects of the RHR dealing with NOx have a compliance deadline of January 27, 2017. "MATS requires control of emissions of mercury, PM, and HCl at coal fired units by April 16, 2016."³

¹ Responsive Testimony, at page 66, lines 11 to 12.

² Responsive Testimony, at page 5, lines 19 to 20.

³ Responsive Testimony, at page 25, lines 5 to 6.

To comply with the regulations on sulfur dioxide emissions, “OG&E proposes (a) to retrofit two large (520 MW and 522 MW) coal-fired power plant units at its Sooner facility with control equipment called dry Flue Gas Desulfurization (“dry FGD” or generally “scrubbers”) and (b) to convert two large (492 MW and 506 MW) coal-fired units at its Muskogee facility to burn natural gas instead of the coal they now burn. OG&E refers to this combination of actions as its *Scrub/Convert* alternative.”⁴

OG&E’s chosen *Scrub/Convert* was one of five alternative compliance plans that OG&E proposed and evaluated. These alternatives were evaluated by forecasting and comparing the present value of OG&E’s system-wide costs of operation over a 30-year period. “Moreover, these cost comparisons were done under nine different sensitivities or scenarios about the future. These nine scenarios varied in their forecasts of the pace at which other utilities in the Southwest Power Pool (“SPP”) converted to natural gas, the level of natural gas prices, the existence of a tax on carbon dioxide emissions, the levels of SPP load, and capital costs for the environmental controls.”⁵

However, OG&E’s chosen *Scrub/Convert* option was not a clear winner. “Notably, despite the fact that OG&E proposed the *Scrub/Convert* alternative as the best, that alternative is never the sole alternative ranked lowest cost; the best *Scrub/Convert* does in the rankings is that it is tied as the lowest cost alternative in three of the nine scenarios.”⁶ Two other alternatives each won in three of the other scenarios. These alternatives are (a) *Scrub*, in which scrubbers are retrofitted on all four of these coal-fired units at Sooner and Muskogee and (b) *Convert*, in which

⁴ Responsive Testimony, at page 6, lines 6 to 11.

⁵ Responsive Testimony, at page 7, lines 5 to 10.

⁶ Responsive Testimony, at page 7, lines 14 to 18.

all of these four coal-fired units are converted to burn natural gas. The costs of all three alternatives are very close and the margin of victory is often just \$0.1 billion. This is quite a small margin in the context of overall system costs that ranged from \$19.7 billion to \$27.0 billion across the range of different compliance alternatives and scenarios.

The fact that three alternatives were often modeled to be quite close in cost simply reflects the uncertainty about the future. “For example, in the high natural gas price scenario, as expected, the *Scrub* alternative was the lowest cost at \$24.7 billion, and the cost of the *Scrub/Convert* alternative was 4.5 percent higher than that. This was expected because retrofitting and keeping the old coal units would look less expensive than the *Convert* alternative, which depends more heavily, directly or indirectly, on natural gas. However, in the low gas price scenario, the *Convert* alternative was the lowest cost, and *Scrub/Convert* was 3.0 percent higher. This was expected because converting to natural gas would look less expensive with low natural gas prices.”⁷

DEFICIENCIES IN OG&E’S EVALUATION OF ITS ECP

I concluded that, especially in the face of this uncertainty, “OG&E’s evaluation is incomplete because of five remaining deficiencies; surprisingly, they remained even after we made OG&E aware of them in both data requests and a phone call on November 19, 2014, and after we asked them to fill those deficiencies with specific analyses for the record.”⁸

⁷ Responsive Testimony, at page 8, lines 4 to 12.

⁸ Responsive Testimony, at page 9, lines 3 to 6.

The first deficiency that I identified is that OG&E did not assess existing, natural gas-fired power plant capacity as an alternative. Such resources appear to be available in the market and could serve to offset the cost and risk of OG&E's market purchases for energy. "OG&E did not conduct a competitive solicitation or a thorough survey of any sort to test the availability of existing natural gas-fired combined cycle plants. An existing combined cycle unit might have reduced the cost of the *Scrub/Replace* and *Replace* alternatives. Even Boston Pacific's own, limited survey readily found two substantial entities (J Power and LS Power) that had existing or new natural gas-fired combined cycle power to offer to OG&E. Notably, OG&E made no mention of these opportunities."⁹

The second deficiency that I identified "is that OG&E did not assess the possibility that new environmental regulations could shut the retrofitted Sooner units before the end of its 30-year analysis timeframe, in 2044. Cutting their operating life short would make the *Scrub/Convert* and *Scrub* alternatives more expensive. The probability is high for tightened federal regulation on coal-fired power plants given what is often characterized as the U.S. EPA's "Campaign on Coal." OG&E discusses this possibility at length in its testimony, but does not assess the implications for its investment in scrubbers."¹⁰

The third deficiency that I identify "is that OG&E did not fully assess the effect of higher or lower load (both capacity and energy) on its own system. Changes in the need for capacity and energy could affect the choice of compliance option."¹¹

⁹ Responsive Testimony, at page 9, lines 10 to 17.

¹⁰ Responsive Testimony, at page 9, line 19 to page 10, line 3.

¹¹ Responsive Testimony, at page 10, lines 5 to 7.

The fourth deficiency that I identify “is that OG&E’s sensitivity analyses are overly simplistic because they change just one variable at a time. Scenarios weighing multiple changes should have been run to be more realistic. For example, a carbon tax would increase the demand for natural gas, which, in turn, could increase the price of natural gas. Thus a scenario that combines such a tax with high natural gas prices is a realistic scenario.”¹²

The fifth deficiency that I identify “is that OG&E relies on forecasts of SPP Market prices which are inconsistent with other assertions OG&E makes. For example, OG&E asserts that new combined cycle plants will be built as early as 2018, but the SPP market prices OG&E forecasts are not high enough to justify that investment. These natural gas prices are key to support its choice to convert units at Muskogee rather than to replace them with existing or new combined cycle units; the *Convert* alternatives rely more heavily on purchases from the SPP Market than would a *Replace* alternative.”¹³

One additional, broad deficiency that I identify is that OG&E ignored the lessons that it should have learned from the comparable proceeding on PSO’s ECP. In addition to the above, I also contrasted OG&E’s ECP with that of another Oklahoma utility, the Public Service Company of Oklahoma (PSO).¹⁴ I first described how the PSO proceeding in 2012 and 2013 gives the Commission a useful point of comparison for OG&E’s proposal.¹⁵ I explained that the heart of PSO’s case involved two PSO coal units at the Northeastern power plant. PSO agreed to a settlement with EPA that shut down one of the two coal-fired units at PSO’s Northeastern power

¹² Responsive Testimony, at page 10, lines 9 to 14.

¹³ Responsive Testimony, at page 10, lines 16 to 23.

¹⁴ Responsive Testimony, Attachment One

¹⁵ Responsive Testimony, page 69, line 1 to page 70 line 17

plant in 2016 and retrofit the other unit with environmental controls before shutting it down in 2026.¹⁶ This allowed PSO to essentially install dry sorbent injection system (DSI) to control SO₂ at the second Northeastern coal unit instead of installing the more expensive technology of FGD, or scrubbers.¹⁷ OG&E did not even consider a similar approach, which could have avoided the installation of scrubbers at Sooner at an estimated capital cost of \$530 million.¹⁸

OG&E'S REFUSAL TO INCORPORATE WIND POWER

Another deficiency that I see in OG&E's planning is a lack of wind power in its evaluation of alternatives. Several intervenors argued that OG&E's failure to consider wind power was one more way in which its filing was deficient or not justified. Instead, they made arguments in favor of substantial purchases of wind energy – as much as 1,900 MW worth by 2020.

I agree that OG&E should have considered wind in its planning. “Oklahoma is a unique location because it is home to some of the best wind resources in America... This also is a unique moment because of the significant tax subsidy for the development of wind power. The Federal Production Tax Credit (PTC) provides a tax subsidy of 2.3 cents per kWh after tax.... The PTC has been extended through 2014 so that wind developers who started their efforts in 2014 may still qualify to receive the PTC for capacity they bring on line in the near term.”¹⁹

¹⁶ Responsive Testimony, page 71, lines 5 to 11

¹⁷ Responsive Testimony, page 72, lines 1 to 3

¹⁸ Responsive Testimony, page 23, lines 15 to 16

¹⁹ Rebuttal Testimony, at page 4, line 12 to page 5, line 2.

“In addition, the Southwest Power Pool Regional Transmission Organization (SPP) has accommodated wind power development in substantial ways with its policies and practices. One key policy is its Highway/Byway transmission cost allocation policy in which two-thirds of the cost of some new transmission facilities below 300 kV may be allocated to the SPP system as a whole rather than to the local utility if they are associated with wind. Like them or not, the tax subsidy and SPP accommodations must be taken as a given and, therefore, I support taking further advantage of this unique place and moment in time by encouraging the development of additional wind power to the extent it lowers energy costs for Oklahoma ratepayers and does not harm reliability.”²⁰

However, I do have a concern that this low cost wind energy may not reach OG&E’s customers. “Intervenors are attracted to wind by the large difference, or margin, between the low cost of wind and forecasted SPP market prices. They see this as a buy low, sell high opportunity. However, the predicted margin cannot be realized unless the wind power is fully deliverable on the SPP system and does not cause offsetting system costs – now and in the future. These are the risks of increased reliance on wind power and “doing it right” requires assessing and mitigating these risks.”²¹

MY RECOMMENDED CONDITIONS

Given these deficiencies, as to OG&E’s ECP, I recommend that the Commission approve OG&E’s choice of its *Scrub/Convert* ECP, but to do so *with conditions* that put the risk of incomplete analysis on OG&E rather than on the Oklahoma ratepayer.

²⁰ Rebuttal Testimony, at page 5, lines 4 to 15.

²¹ Rebuttal Testimony, at page 6, lines 17 to 23.

“For the two retrofitted coal units at the Sooner facility, I recommend that approval be subject to the condition that, if these units are shut down at any time prior to 2044, OG&E would not receive compensation for stranded investment. Related to this is the condition that the recovery of capital costs be over the assumed book life used in OG&E’s analysis. In addition, I recommend that OG&E be held to the capital cost and operating performance that it assumed for the retrofitted Sooner plants.”²²

“For the two units at Muskogee, I recommend that OG&E be held to the capital cost and operating performance that it assumed for these converted plants. Operating performance here includes, for its converted plants, heat rate, ramp rate, and cold and hot start times. Further, these operating parameters would limit cost recovery for the participation of the Muskogee units in the SPP market. For example, the assumed heat rate curve for the converted Muskogee units would limit fuel cost recovery.”²³

I also recommend that OG&E be required to conduct a wind power procurement, and that it be done right in terms of the way bids are evaluated, the terms of the contracts, and the amount of wind power solicited. To that end, I suggest eleven guidelines for the procurement of wind resources. These guidelines are laid out specifically in my rebuttal testimony, but in general, “I recommend that (a) wind power be contracted for under pay-for-performance contracts rather than acquired by OG&E – ratepayer protections are better this way; (b) SPP vet all bids to assess possible system limitations; and (c) rather than specifying a level of wind resources to be

²² Responsive Testimony, at page 65, lines 14 to 20.

²³ Responsive Testimony, at page 66, lines 1 to 7.

procured, specify only a minimum procurement target (200 MW) and allow the market to ultimately dictate how much wind is contracted to benefit Oklahoma ratepayers.”²⁴

“The primary motive for recommending the wind procurement is to add to the diversity of OG&E’s resource portfolio in the face of substantial uncertainty. With my full set of recommendations, OG&E would have a diversified mix of coal, natural gas, and wind resources.”²⁵

I also include recommendations on OG&E’s rate proposal. I recommend that the discussion of rate recovery be deferred until OG&E’s rate case.²⁶ However, the Commission should rule here that the proposed conditions for approval of the ECP be incorporated into the ultimate rate case decision including any fuel adjustment clause implementation.²⁷

My main reason for providing these recommendations on OG&E’s rate recovery is that OG&E’s rate recovery proposal puts too much risk on the shoulders of ratepayers.²⁸ I explain that the EGP rider – the mechanism by which OG&E proposes to recover its capital investment – does not hold OG&E to a firm cap on the amount it can recover through the rider.²⁹ As a result, the EGP rider, as proposed, is a “blank check” to OG&E from its customers,³⁰ and that each of

²⁴ Rebuttal Testimony, at page 7, lines 3 to 9.

²⁵ Rebuttal Testimony, at page 7, lines 12 to 15.

²⁶ Responsive Testimony, page 14, lines 18 to 19.

²⁷ Responsive Testimony, page 14, lines 19 to 22.

²⁸ Responsive Testimony, page 49, lines 19 to 20.

²⁹ Responsive Testimony, page 52, lines 8 to 11.

³⁰ Cite CR data response.

the three “ratepayer protections” proffered by OG&E do not provide significant ratepayer protections.³¹

To help protect ratepayers, I recommend that OG&E’s rate proposal embed the cost caps and performance requirements set here as conditions for approval of the environmental compliance plan.³²

I also recommend that OG&E not be allowed to earn any return on capital investment beyond the firm, fixed amount it specifies, nor can OG&E earn Construction Work in Progress (CWIP) returns on more than this amount or for periods beyond the projected construction time if construction delays occur.³³ I recommend that OG&E not recover any depreciation, property tax, O&M expense, or regulatory asset amortization costs through the EGP rider until the underlying assets with which those costs are associated are in service.³⁴ Otherwise, as I explain, OG&E’s cost recovery would diverge from pure CWIP recovery.³⁵

Finally, regarding increases in costs recovered through the Fuel Adjustment Clause (FAC), I recommend that OG&E be held to the same plant performance estimates discussed above, including fuel and air quality control systems consumables (AQCS) costs.³⁶ I explain that I do not believe that OG&E should be required to take the risk of changes in market prices for fuel and AQCS consumables, but it should be held to its estimates for the amount, per MWh, of fuel

³¹ Responsive Testimony, page 59 line 1 to page 64 line 4.

³² Responsive Testimony, page 67, lines 18 to 20.

³³ Responsive Testimony, page 67, lines 20 to 23.

³⁴ Responsive Testimony, page 67 line 23 to page 68 line 3.

³⁵ Responsive Testimony, page 58, lines 11 to 12.

³⁶ Responsive Testimony, page 68, lines 5 to 7.

used to run its generating assets and the amount of AQCS consumables needed to comply with environmental regulations; otherwise, OG&E will have license to pass all costs through the FAC with no protections for ratepayers.³⁷

OG&E'S MUSTANG MODERNIZATION PLAN

Turning to OG&E's MMP, its essence is that OG&E would retire the existing Mustang units earlier than was expected in its 2012 Integrated Resource Plan ("IRP"), and then replace that capacity with new natural gas-fired combustion turbines that OG&E would build at that same site.

As with OG&E's ECP, I also find that OG&E's assessment of its MMP is incomplete. This is "because OG&E failed to assess the full range of reasonable alternatives to the replacement of the aging Mustang capacity. That is, OG&E only fully considered new combustion turbines that OG&E itself would build at the Mustang site. OG&E did not fully evaluate existing and new combined cycle units at the Mustang site or at any other location, whether the units are built by OG&E or by independent power producers."³⁸

OG&E attempted to support its narrowed assessment by arguing "that the Mustang site is uniquely important for system reliability. In a later data response, however, OG&E backed off by agreeing that any power plant which qualifies as a Network Resource in SPP would be comparably important to system reliability. OG&E also tried to justify its accelerated plan for the Mustang retirements by stating that the old units would suffer greater break downs if they were

³⁷ Responsive Testimony, page 64, lines 8 to 14.

³⁸ Responsive Testimony, page 45, lines 3 to 8.

subject to the stop-and-start dispatch likely in the SPP Market. However, OG&E's own analysis shows the opposite. For example, in the 2012 IRP the Mustang units were forecasted to start 77 times in 2017, while in the new, 2014 IRP they are started just 12 times. Additionally, while the 2012 IRP forecast 132 starts for the Mustang units in 2014, starts are no higher – just 104 so far in 2014.”³⁹

“I recommend that the Mustang modernization plan be deferred until the successful completion of a competitive procurement. Bids would be invited from both natural gas-fired combustion turbines and combined cycle plants. As was done in previous procurements, SPP would be asked to judge whether such a designation would necessitate system costs, which would be included in bid evaluation. In addition, any bidder should be eligible to build at the Mustang site so that Oklahoma ratepayers can enjoy the potential for lower costs that might result. Finally, OG&E would be required to bid under the same rules as all other bidders. As to the timing of Mustang's retirement, the bids would determine the best pace.”⁴⁰

Finally, with regards to rate recovery for any plan associated with the Mustang site, the Commission should rule here that the proposed conditions for approval of OG&E's MMP be incorporated into the ultimate rate case decision including any fuel adjustment clause implementation.⁴¹

³⁹ Responsive Testimony, page 13, lines 7 to 17.

⁴⁰ Responsive Testimony, page 14, lines 6 to 15.

⁴¹ Responsive Testimony, page 14, lines 19 to 22.

Certificate of Service

This is to certify that on February 20, 2015, a true and correct of the above and foregoing
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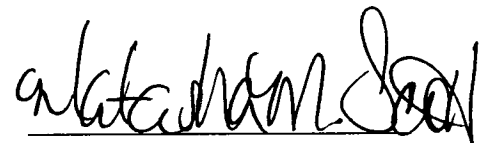
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