

**BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA**

APPLICATION OF MARK ARGENBRIGHT,	)	
DIRECTOR OF THE PUBLIC UTILITY DIVISION,	)	
OKLAHOMA CORPORATION COMMISSION,	)	
FOR PUBLIC HEARING TO REVIEW AND	)	
MONITOR APPLICATION OF THE FUEL	)	
ADJUSTMENT CLAUSE OF <b>OKLAHOMA GAS</b>	)	CASE NO. PUD 2023-000055
<b>AND ELECTRIC COMPANY</b> FOR THE	)	
CALENDAR YEAR 2022	)	
AND,	)	
FOR A PRUDENCE REVIEW OF THE ELECTRIC	)	
GENERATION, PURCHASED POWER AND FUEL	)	
PROCUREMENT PROCESSES AND COSTS OF	)	
<b>OKLAHOMA GAS AND ELECTRIC COMPANY</b>	)	
FOR THE CALENDAR YEAR 2022	)	
	)	

Direct Testimony

of

Robert Doupe

On behalf of

Oklahoma Gas and Electric Company

August 29, 2023

Robert Doupe  
*Direct Testimony*

1 Q. **Please state your name and business address.**

2 A. My name is Robert Doupe. My business address is 321 North Harvey, Oklahoma City,  
3 Oklahoma 73102.  
4

5 Q. **By whom are you employed and in what capacity?**

6 A. I am employed by Oklahoma Gas and Electric Company (“OG&E” or “Company”) as  
7 Director, Power Supply Services.  
8

9 Q. **Please summarize your professional and educational background.**

10 A. I have a Bachelor of Science degree in Mechanical Engineering from University of  
11 Missouri – Rolla (now known as Missouri University of Science and Technology). I have  
12 been employed by OG&E for the last 23 years in several positions of increasing  
13 responsibility including engineering, maintenance, and operations. I began my career with  
14 OG&E in 2000 as a Process/Maintenance Engineer at the Horseshoe Lake and Mustang  
15 Power Plants. In March of 2005, I moved to the Power Supply Services group as a Staff  
16 Mechanical Engineer. In 2008, I became the Superintendent of Power Generation – Coal  
17 at Sooner Power Plant. In February 2011, I became the Director of Redbud Power Plant,  
18 and in October of 2017, Horseshoe Lake Power Plant was added to my responsibilities. In  
19 February 2021, I transitioned into the role of Director of Power Supply Services.

20 In my current role, I am responsible for the operations and maintenance of  
21 engineering functions and the management of capital projects for all of OG&E’s thermal  
22 generation fleet. In this role, I supervise a team of approximately 80 members including  
23 engineers, project managers, and construction services personnel. In addition, I supervise  
24 the asset condition monitoring organization that is accountable for the predictive  
25 maintenance technologies OG&E deploys to monitor and analyze the condition of our  
26 plants. I have worked at several OG&E Plants throughout my career either as a member  
27 of the plant or as a Power Supply Services Engineer. Overall, my experience as an engineer  
28 and leader at different levels throughout Power Supply has allowed me to become well  
29 versed in the operations and maintenance needs of the OG&E fleet

1 Q. **Have you previously testified before the Oklahoma Corporation Commission?**

2 A. Yes, I have filed testimony in Cause Nos. PUD 202100072, PUD 202100118, PUD  
3 202100164 and PUD 2022000057.

4  
5 Q. **What is the purpose of your testimony?**

6 A. The purpose of my testimony is to describe the OG&E generating fleet's operational  
7 performance in 2022.

8

9

**OG&E'S GENERATION FLEET**

10 Q. **Please generally describe the generation facilities owned and operated by OG&E.**

11 A. OG&E owns and operates a portfolio of fossil-fueled and wind-powered generating plants.  
12 Sooner, Muskogee (Unit 6), and River Valley plants are coal-fired, while Seminole,  
13 Horseshoe Lake, Frontier, Muskogee (Unit 4 and 5), and Mustang are natural gas-fired  
14 power plants. In addition, OG&E operates and is the majority owner of two combined  
15 cycle gas-fired generation facilities: McClain and Redbud. Finally, OG&E owns and  
16 operates approximately 450 MW of nameplate wind generation.

17 Table 1 below illustrates OG&E's generation resources, including the 2022 tested  
18 capacity of each unit, and when those assets began commercial operation.

**Table 1 - 2022 Tested Capacity**

Unit Type	Unit Name	First Year in Service	Capacity: (MW)
<b>Coal Fired Steam (1852 MW)</b>	Muskogee 6	1984	503
	River Valley 1	1991	161
	River Valley 2	1991	157
	Sooner 1	1979	516
	Sooner 2	1980	515
<b>Gas Fired Steam (3241 MW)</b>	Muskogee 4	1977	487
	Muskogee 5	1978	488
	Horseshoe Lake 6	1958	170
	Horseshoe Lake 7	1963	211
	Horseshoe Lake 8	1969	377
	Seminole 1	1971	500
	Seminole 2	1973	510
<b>Combined Cycle (1112 MW)</b>	Seminole 3	1975	498
	Frontier	1989	121
	McClain	2001	378
<b>Combustion Turbine (552 MW)</b>	Redbud	2002	613
	Horseshoe Lake 9	2000	45
	Horseshoe Lake 10	2000	43
	Tinker 5A	1971	33
	Tinker 5B	1971	31
	Mustang 6	2018	57
	Mustang 7	2018	56
	Mustang 8	2018	58
	Mustang 9	2018	57
	Mustang 10	2018	57
	Mustang 11	2018	58
<b>Owned Wind (81 MW)</b>	Mustang 12	2018	57
	Centennial	2007	23
	OU Spirit	2009	16
	Crossroads	2012	42

- 1 Q. Does OG&E own any solar generation facilities?
- 2 A. Yes. OG&E owns 32.5 megawatts of photovoltaic (“PV”) solar.

1 Q. **Why is the capacity of the OG&E-owned solar not accounted for in Table 1?**

2 A. The OG&E owned solar is connected to the distribution system and acts as load reduction  
3 for the circuits where it is connected. Therefore, it was not counted as part of our total  
4 generation capability in 2022.

5  
6 Q. **Does the MFR Package include information regarding OG&E's generation  
7 availability and dispatch?**

8 A. Yes. I support Schedule G, which includes generator availability and dispatch during 2022.  
9 Schedule G-1 contains a tabular summary of the monthly availability of each generating  
10 unit, and Schedule G-4 contains a listing of all outages, derates, and an event description.  
11 The monthly availability of the generating units is measured as the equivalent availability  
12 factor ("EAF").

13

14 Q. **What is EAF and why is it an appropriate measure of plant performance?**

15 A. EAF is a reliability metric defined by North American Electric Reliability Corporation  
16 ("NERC") in their Generating Availability Data System ("GADS") as the fraction of hours  
17 the unit was available to produce electricity after all types of outages and deratings are  
18 considered compared to the total period hours. The EAF metric is an appropriate measure  
19 of a unit's ability to deliver its full output of energy for use by customers during a given  
20 period. Capacity Factor is another metric that reflects output from specific units that is  
21 driven by the Southwest Power Pool ("SPP") market dispatch instructions.<sup>1</sup>

22

23

### **Coal Unit Performance**

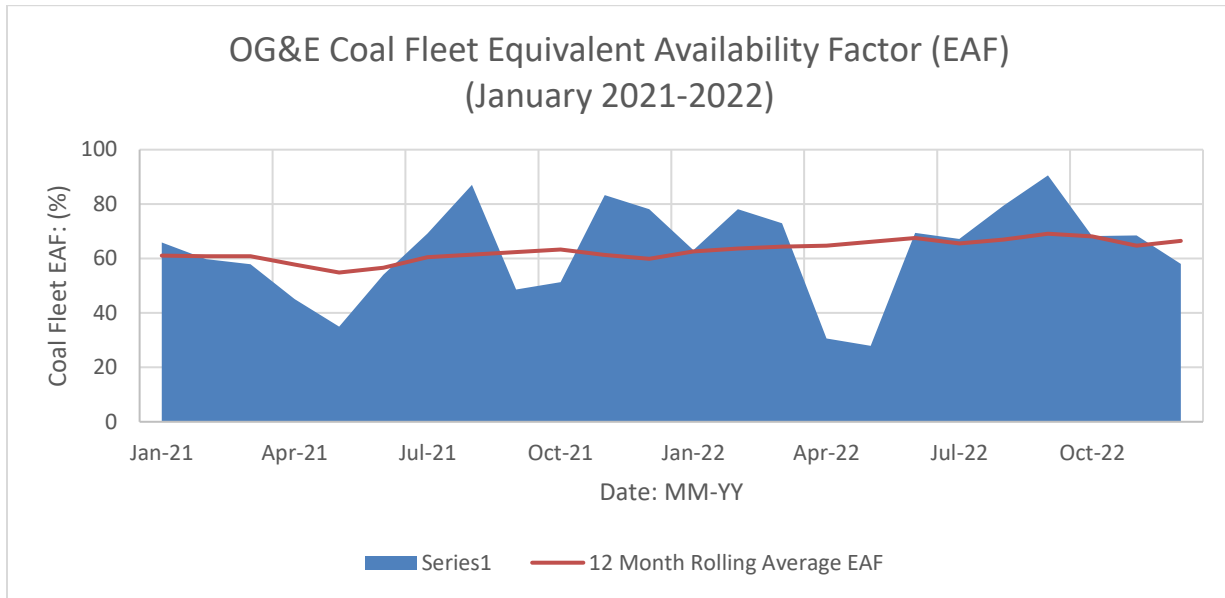
24 Q. **Please compare the coal fleet EAF for 2022 and 2021.**

25 A. The 12-month rolling average EAF of OG&E's coal-fired units from January 2021 through  
26 December 2022 is illustrated in Chart 1 below. The annual average coal fleet EAF  
27 performance in 2022 was 64.38% compared to 61.31% in 2021.

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<sup>1</sup> CF is a performance measure that represents how the units were utilized in the market. CF is how much power a unit made compared to the amount of power it could have made for a defined period of time. A number of variables can affect CF performance. This value is discussed herein in compliance with the settlement agreement from the 2021 Fuel Prudence Review, Order No. 73377, in Case No. 2022-000057.

**Chart 1 - Coal Plant EAF**



1 Q. **Please describe the performance and output of OG&E’s coal-fired generating units.**

2 A. In 2022, OG&E’s combined coal fleet EAF was 64.38 percent (with a Capacity Factor  
 3 (“CF”) of 27 percent) compared to a three-year average coal fleet EAF of 65.57 percent  
 4 (with a three-year average CF of 32.85 percent). OG&E’s coal fleet had a number of  
 5 outages that affected the overall EAF in 2022. As discussed in more detail below,  
 6 Muskogee Unit 6 had a scheduled major Planned Outage (“PO”) for two months in the Fall  
 7 2022. This major outage included High Energy Piping (“HEP”) Inspections, Flow  
 8 Accelerated Corrosion (“FAC”) Inspections, Boiler Inspections, Turbine Inspection,  
 9 Turbine Valve Inspection, and Balance of Plant equipment. Major outages with this type  
 10 of work tend to be longer in nature due to the amount of equipment that is opened and  
 11 inspected. Muskogee Unit 6 also had some deratings and maintenance outages in 2022  
 12 that led to its reduced EAF.

13 In addition to Muskogee Unit 6’s major Fall PO, Muskogee Unit 6, Sooner Unit 1,  
 14 Sooner Unit 2, River Valley Unit 1 and River Valley Unit 2 all had POs in the spring to  
 15 prepare for the summer run. These spring POs are used to address any issues that have  
 16 come up throughout the year that would prevent the unit from having a successful summer  
 17 run. As discussed in detail below, there were several maintenance and forced outages at  
 18 the five coal units during 2022.

1 Q. **Please describe the performance and output of OG&E's Sooner Unit 1.**

2 A. Sooner Unit 1's EAF was 78.34 percent (with a CF of 29.4 percent) in 2022 compared to  
3 a three-year average EAF of 68.69 percent (with a three-year average CF of 33.05 percent).  
4 Sooner Unit 1 had a three-week PO that got extended for five days in the spring to prepare  
5 for the summer run. Sooner Unit 1 also had three total maintenance outages for a total of  
6 fourteen days to repair tube leaks and inspect/balance primary air fans. Sooner Unit 1 had  
7 one forced outage that lasted roughly fourteen days in December 2022, due to high  
8 vibration on the turbine.  
9

10 Q. **Please describe the performance and output of OG&E's Sooner Unit 2.**

11 A. Sooner Unit 2's EAF was 84.21 percent (with a CF of 30.21) in 2022 compared to a three  
12 average EAF of 70.79 percent (with a three-year average CF of 33.54 percent). As stated  
13 above, Sooner Unit 2 had a three-week PO in the spring to prepare for the summer run.  
14 Sooner Unit 2 also had two maintenance outages in 2022; one to inspect/repair conveyor  
15 belt #11, and a second to replace the belt once the material arrived on site.  
16

17 Q. **Please describe the performance and output of OG&E's Muskogee Unit 6.**

18 A. Muskogee Unit 6's EAF was 45.36 percent (with a CF of 22.55 percent) in 2022 compared  
19 to a three average EAF of 54.79 percent (and a three-year average CF of 35.29 percent).  
20 Muskogee Unit 6 had an almost four-week PO in the spring to prepare for the summer run,  
21 as well as a two month major PO in the fall 2022. In addition, Muskogee Unit 6 had five  
22 deratings in 2022 with the most significant being a derating for roughly seven weeks due  
23 to a circulating water pump failure. The circulating water pump was scheduled to be  
24 overhauled in the fall major PO but failed in the first week of June resulting in a 250 MW  
25 derating that lasted until the end of July. The pump was overhauled and then placed back  
26 in service in July 2022, thus returning the unit to full capacity. Muskogee Unit 6 also had  
27 a derating in December 2022 for roughly five days that limited the unit to 250 MWs due to  
28 a boiler feed pump turbine trip.

29 Muskogee Unit 6 also had two maintenance outages in 2022. The first maintenance  
30 outage was in February 2022 to address a vibration issue on the main turbine. That first  
31 maintenance outage lasted roughly seventeen days. The second maintenance outage started

1 in March 2022 and ran to the start of the spring PO. The second maintenance outage was  
2 to address issues with the “A” Induced Draft Fan Blade pitch sticking. This fan is a two-  
3 stage, variable pitch axial design. The hub and shaft of the fan have multiple internal  
4 mechanisms to actuate the blades and control flow. Plant maintenance had made a number  
5 of adjustments to the external controls without success. The decision was made to  
6 disassemble and overhaul the fan during a maintenance outage in order to resolve the issue.  
7 The fan was scheduled to be overhauled in the fall of 2022. The root cause was determined  
8 to be excessive wear of the two brass bushings that support the control shaft which runs  
9 down the center of the main rotor.

10  
11 **Q. Please describe the performance and output of OG&E’s River Valley Unit 1.**

12 A. River Valley Unit 1’s EAF was 70.03 percent (with a CF of 34.99 percent) in 2022  
13 compared to the three year average EAF of 61.76 percent (and a three-year average CF of  
14 23.62 percent). River Valley Unit 1 had a scheduled PO in the spring to prepare for the  
15 summer run. River Valley Unit 1 had a start failure in January that lasted a month due to  
16 high vibration on the turbine. In 2022, River Valley Unit 1 also had a maintenance outage  
17 in March and three deratings throughout the year due to tube leaks in the boilers.

18  
19 **Q. Please describe the performance and output of OG&E’s River Valley Unit 2.**

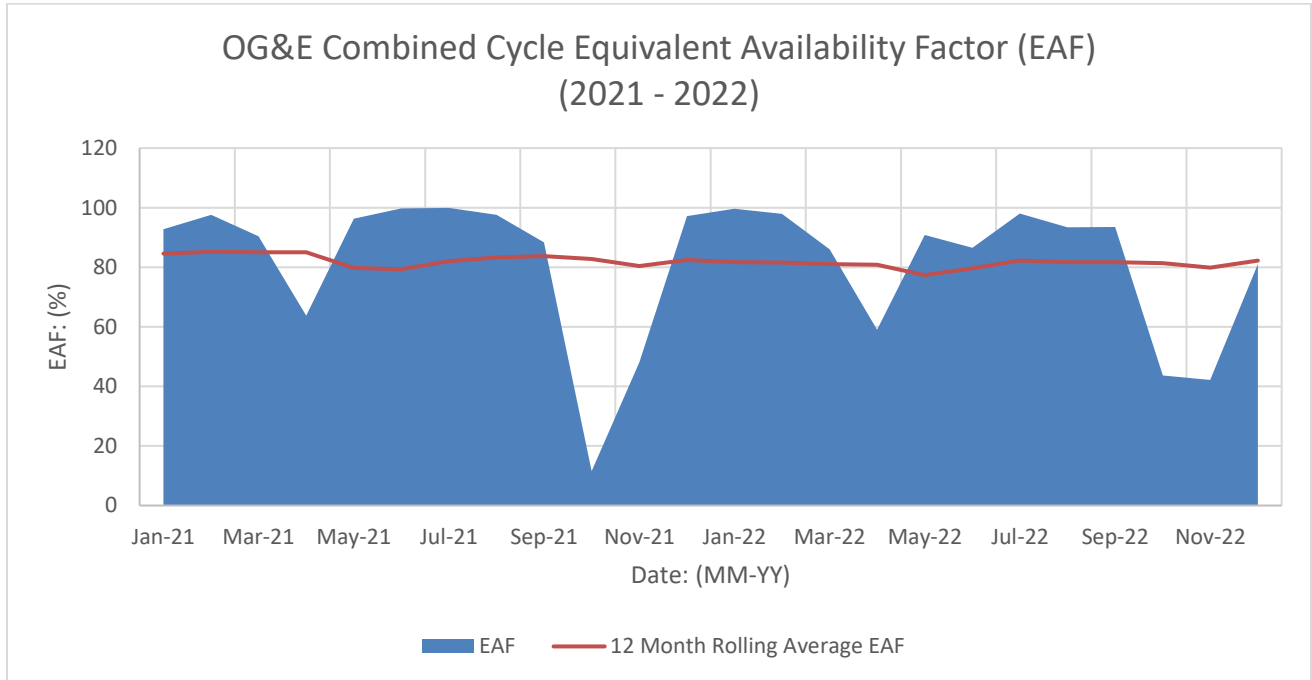
20 A. River Valley Unit 2’s EAF was 43.98 percent (with a CF of 16.17 percent) in 2022  
21 compared to the 3-year average EAF of 71.8 percent (and a three-year average CF of 31.06  
22 percent). River Valley Unit 2 had a scheduled PO in the spring of 2022. The PO was  
23 scheduled to last forty-five days in order to perform a minor boiler overhaul but had to be  
24 extended three weeks due to a relay upgrade project on the generator and transformer.  
25 River Valley Unit 2 also had two maintenance outages in 2022; one in July to repair a tube  
26 leak, and a second in December to perform a boiler chemical clean. River Valley Unit 2  
27 also experienced four forced outages. Three of the forced outages were a result of tube  
28 leaks in the boiler and the fourth one was due to a steam leak on the 3 element level  
29 controller. River Valley Unit 2 also experienced a number of deratings due to tube leaks  
30 in the boiler.

1 **Combined Cycle Performance**

2 Q. **Please describe the reliability of OG&E's combined cycle plants in 2022 and how that**  
 3 **trend has changed over time.**

4 A. As Chart 2 below demonstrates, EAF for the OG&E combined cycle plants remained  
 5 relatively flat from 2021 to 2022, *i.e.*, 82 percent in 2021 and 81 percent in 2022.

**Chart 2 - Combined Cycle EAF**

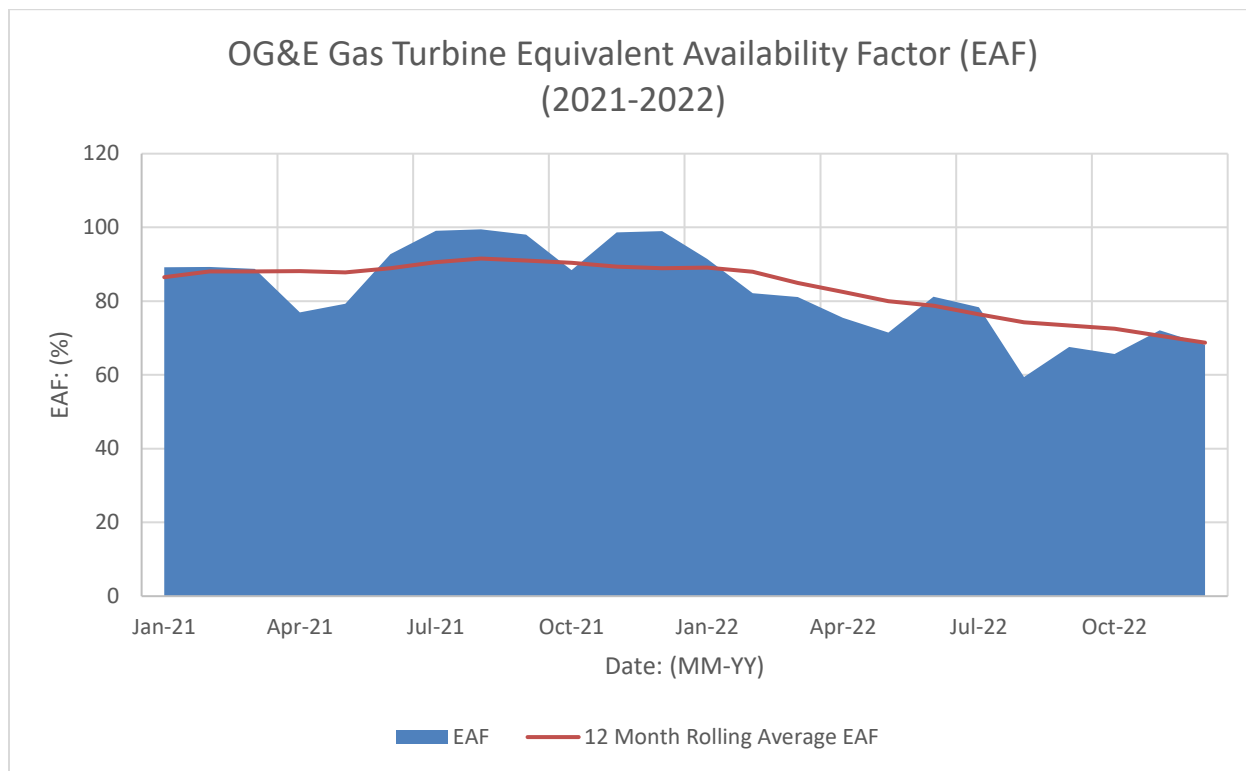


**Simple Cycle Combustion Turbine Performance**

6 Q. **Please explain how OG&E's natural gas Simple Cycle Combustion Turbine fleet**  
 7 **performed in 2021.**

8 A. As Chart 3 demonstrates, the OG&E simple cycle fleet EAF decreased from 89 percent in  
 9 2021 versus 69 percent in 2022. Mustang Units 6, 8, 9, and 10 all experienced significant  
 10 outages that will be discussed below.

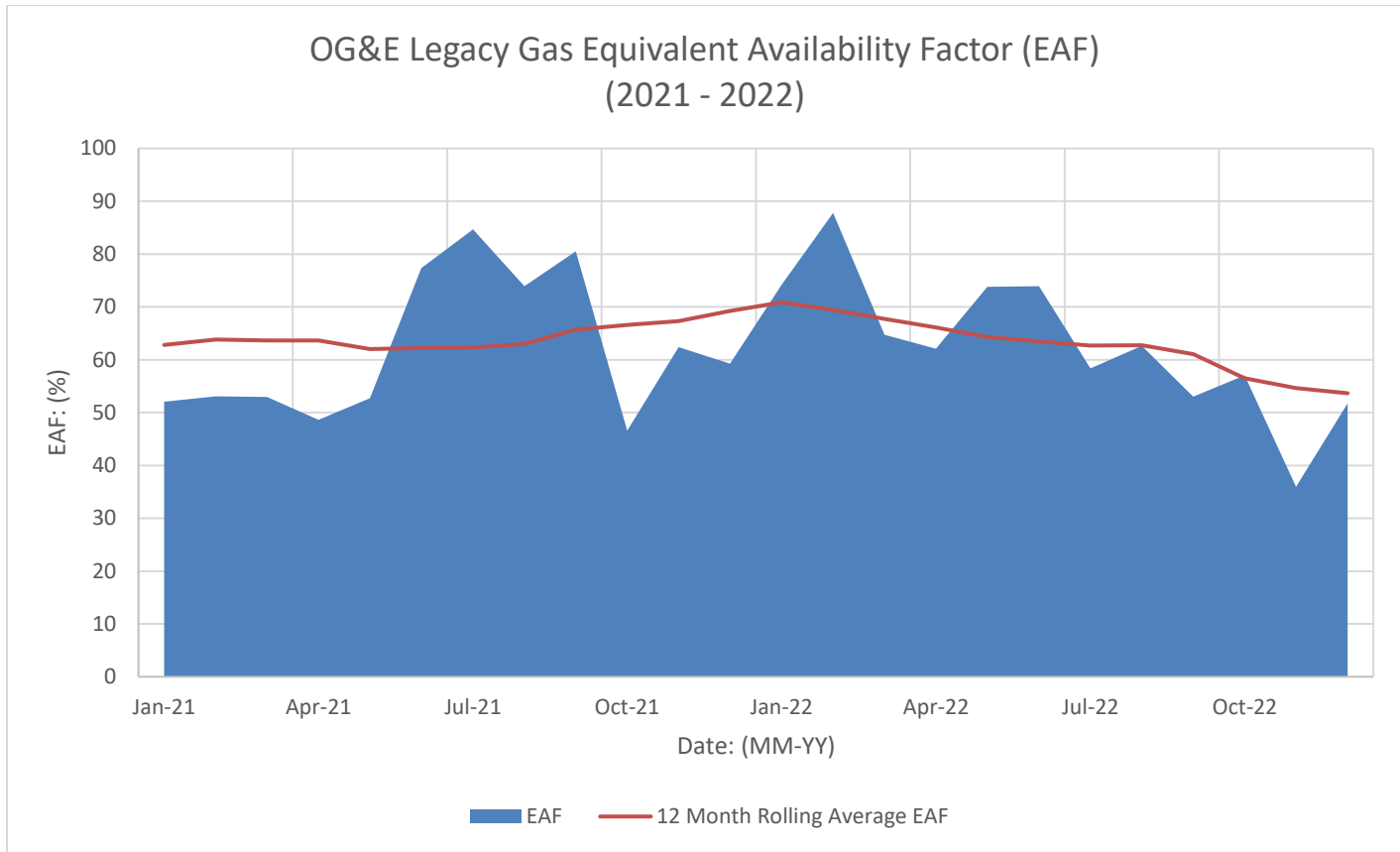
**Chart 3 – Simple Cycle Gas Turbine EAF**



**Legacy Gas Unit Performance**

- 1 Q. **Please explain how OG&E’s Legacy Gas fleet performed in 2022.**
- 2 A. As Chart 4 demonstrates, the OG&E legacy gas fleet EAF decreased from 69.41 percent
- 3 in 2021 to 53.66 percent in 2022. The largest driver was due to a major PO on Seminole
- 4 Unit 3 that included High Energy Piping (“HEP”) Inspections, Flow Accelerated Corrosion
- 5 (“FAC”) Inspections, Boiler Inspections, Boiler Tube Circuit Replacement, Turbine
- 6 Upgrade, Turbine Valve Inspection, Exciter Rotor Rewind, and Generator Inspections.
- 7 Major outages with this type of work tend to be longer in nature due to the amount of
- 8 equipment that is opened and inspected. Seminole Unit 2 also had a scheduled PO in the
- 9 fall that lasted roughly thirty-seven days. In addition to the scheduled POs at Seminole
- 10 Units 2 and 3, there were significant outages at Horseshoe Lake Units 7 and 8, which are
- 11 discussed below.

**Chart 4 – Legacy Gas Units EAF**



**UNIT AVAILABILITY PERFORMANCE**

1 Q. **Did OG&E have any significant outages in 2022?**

2 A. Yes, there were six significant outages in 2022. “Significant outages” have a duration  
 3 greater than 1,000 hours and of a forced nature or an extension to a planned outage event.  
 4 I discuss these six outages below.

5  
 6 **Horseshoe Lake Unit 7**

7 Q. **Did Horseshoe Lake Unit 7 experience any significant outages in 2022?**

8 A. Yes. On June 17, 2022, while operating near full load, one of the 6-inch downcomer  
 9 distribution pipes on Horseshoe Lake Unit 7’s boiler ruptured, causing a sudden release of  
 10 high pressure water. The high pressure water flashed to saturated steam, filling the boiler  
 11 and turbine buildings. Saturated steam entered the 4160V switchgear and caused an arc  
 12 flash event resulting in the 4160V 7A and 7B tripping, as well as subsequent damage/loss

1 of R703 Reserve Feed Breaker 152-R703. This also meant that all 480V motor control  
 2 centers were lost as well. With the main feed (both A and B) along with reserve feed  
 3 unavailable, the DC power system and station batteries became the main source of  
 4 available power for Horseshoe Lake Unit 7. The Emergency Bearing Oil Pump (“EBOP”)  
 5 was in manual operation due to a failed solenoid. The turbine deck filled with saturated  
 6 steam creating a situation that prevented the operations team from being able to safely  
 7 respond and initiate a start of the EBOP, which resulted in the turbine not having oil  
 8 supplied on coast down. Damage was sustained in the boiler, steam turbine, generator, and  
 9 balance of plant equipment. Plant personnel worked with contractors in order to access the  
 10 effected equipment and begin a clean-up effort. The plant team worked to restore power  
 11 to essential equipment. The clean up and restoration of essential equipment took roughly  
 12 four months. OG&E is currently working on a resolution with our insurance companies.

13  
 14 **Horseshoe Lake Unit 8**

15 Q. **Did Horseshoe Lake Unit 8 experience any significant outages in 2022?**

16 A. Yes. On August 28, 2022, an auxiliary operator detected an unusual smell, and it was  
 17 traced back to the main and auxiliary transformers on Horseshoe Lake Unit 8. The operator  
 18 noticed smoke coming from the 4160V low side cabinet on the auxiliary transformer.  
 19 Horseshoe Lake Unit 8 was removed from service and placed in a forced outage. It was  
 20 determined that the transformer experienced an extreme overheating (thermal) event. After  
 21 a thorough investigation, repairs were made to the transformer. The transformer was  
 22 vacuum processed and refilled with oil. The transformer was tested, and everything  
 23 appeared satisfactory except a core ground. A Kelman Desolved Gas Analyzer (“DGA”)  
 24 monitor and a Mobile Viasala DGA monitor have been installed to continuously monitor  
 25 the transformer while in service.

26  
 27 **Mustang Unit 6, 8, 9, and 10**

28 Q. **Did Mustang Units 6, 8, 9, and 10 experience any significant outages in 2022?**

29 A. Yes. Equivalent Availability Factors for these and all OG&E owned units may be found  
 30 in the Minimum Filing Requirements package under Schedule G-1.

1 Q. **Please discuss the Mustang Unit 6, 8, 9, and 10 outages in 2022?**

2 A. Mustang Units 6, 8, 9, and 10 Combustion Turbines experienced a rear tail bearing failure  
3 due to a defect. OG&E is currently negotiating with the manufacturer on a resolution.  
4

5 **CONCLUSION**

6 Q. **Did the Company prudently operate its generating units in 2022?**

7 A. Yes. Based on my experience in the maintenance and operations of electric utility  
8 generating assets, OG&E efficiently and prudently managed its generation fleet to the  
9 benefit of all our customers. Finally, each outage discussed above was mitigated to the  
10 extent possible both from a timing and cost perspective, with a focus on ensuring safe and  
11 reliable operating conditions.  
12

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

14 A. Yes.

