

Gas Emergency Response Time Target by PSE

Forward-Thinking SOLUTIONS

Serving utilities, private industry,
government entities, and associations
across North America



- Established in 1974
- Employee-Owned
- Independent

Service Areas Include:

- **Communications Infrastructure**
- **Energy Resources**
- **Industrial Facilities**
- **Utility and Data Analytics**
- **Rates and Finance**
- **Transmission and Distribution**
- **Utility Automation**

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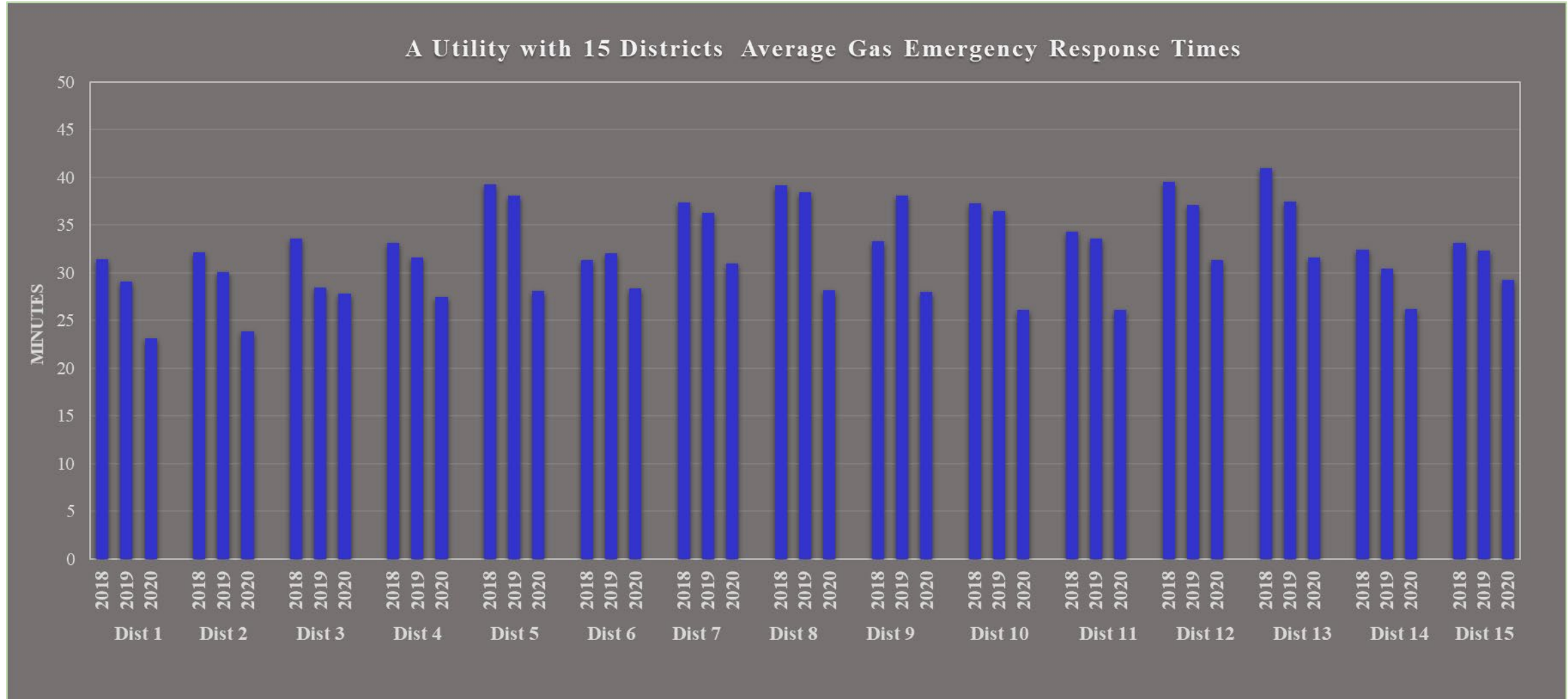
PSE's Emergency Gas Response Time

The study which include 22 utilities across the U.S. involves:

- Company's estimated and actual gas response time by district/operating centers.
- The company's confidence interval of response time compared with other utilities.
- Model estimates of company's gas response time by districts/centers based on external factors unique to each centers.
- PSE's recommended target based on external factors and peer comparison in confidence interval.
- The study entails a comprehensive report including tables and graphics.
- Coveys to managers/regulators how much confidence to put into the results.

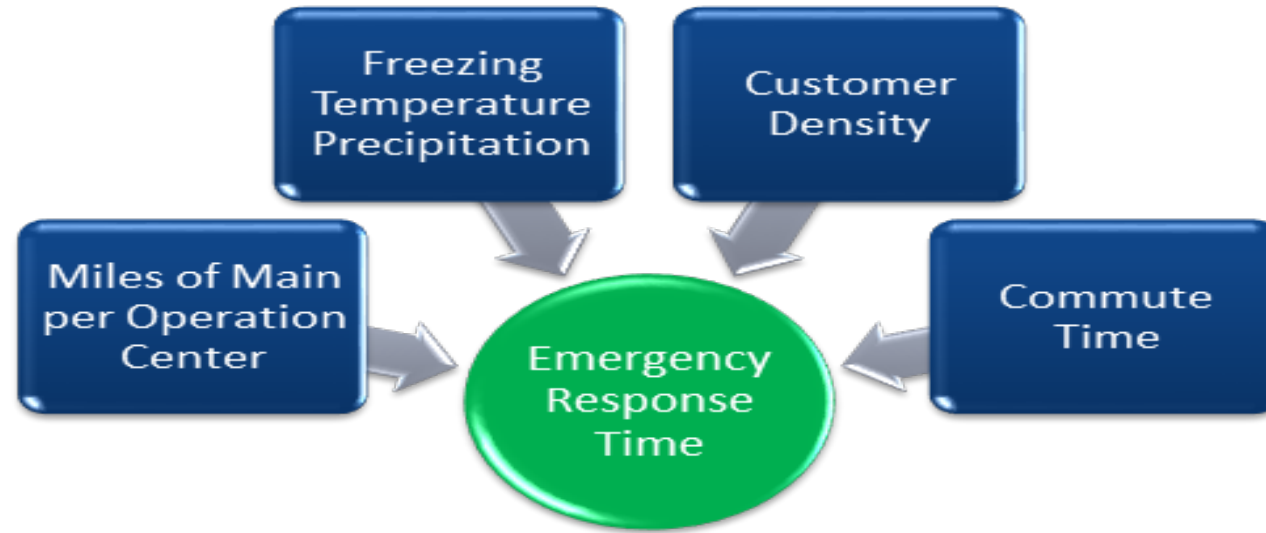
A Utility with 15 Districts Average Gas Emergency Response Times

- Downward (improving) trend, where is the equilibrium or expected level?



Econometric Model

- The econometric method creates a model that directly estimates how service territory conditions influence emergency response times.



- PSE uses a Translog functional form to estimate the impact of the variables above on expected gas response time.
- The variables selected are unique to a specific service territory.

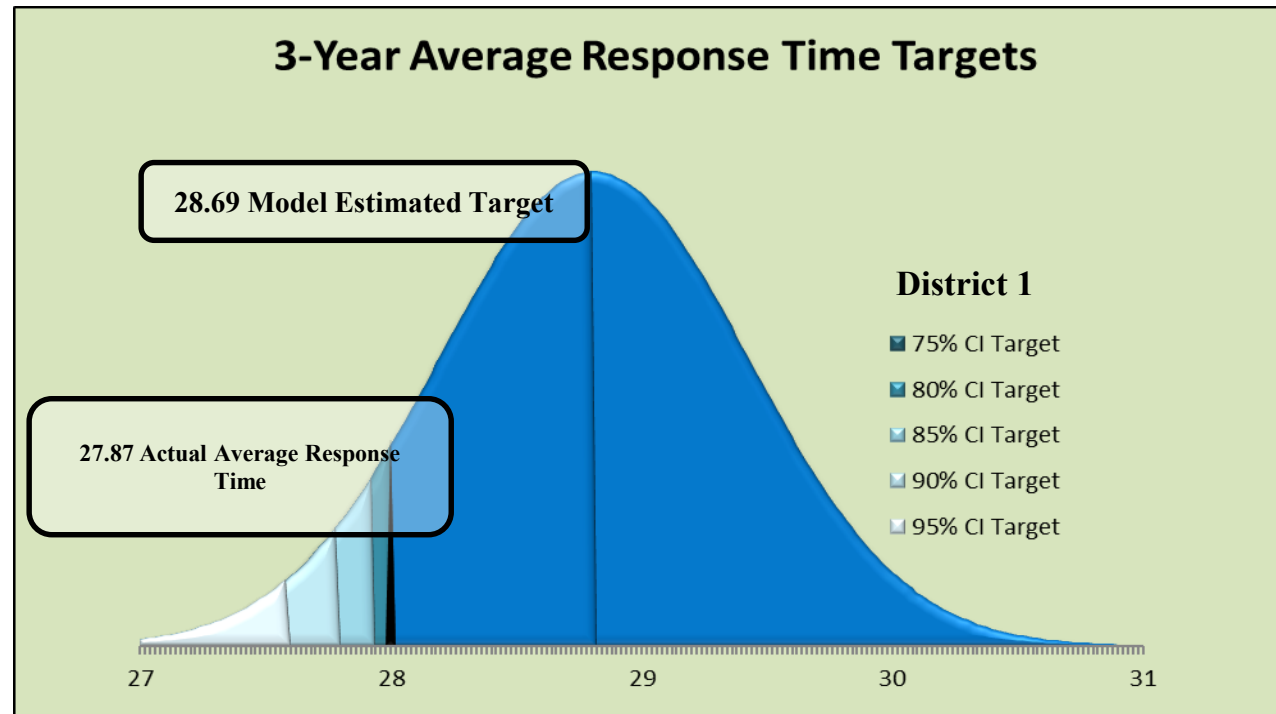
Results for Selected Districts

- Actual versus PSE Model's Expected
- All the districts in this selection beat model expected 3-year average

| Actual and Model Expected Gas Emergency Response Time | | | |
|---|--------------------------|--------------|--------------------|
| Operating Districts | Year | Actual | PSE Model Expected |
| District 1 | 2018 | 31.42 | 32.16 |
| | 2019 | 29.09 | 30.07 |
| | 2020 YTD | 23.10 | 23.86 |
| | Average 2018-2020 | 27.87 | 28.69 |
| District 2 | 2018 | 31.53 | 32.45 |
| | 2019 | 29.48 | 29.85 |
| | 2020 YTD | 28.16 | 28.55 |
| | Average 2018-2020 | 29.72 | 30.28 |
| District 3 | 2018 | 33.58 | 33.68 |
| | 2019 | 28.47 | 29.39 |
| | 2020 YTD | 27.85 | 28.08 |
| | Average 2018-2020 | 29.97 | 30.38 |
| District 4 | 2018 | 39.16 | 39.68 |
| | 2019 | 38.46 | 38.95 |
| | 2020 YTD | 28.22 | 28.48 |
| | Average 2018-2020 | 35.28 | 35.71 |
| District 5 | 2018 | 33.31 | 33.35 |
| | 2019 | 38.08 | 38.18 |
| | 2020 YTD | 28.03 | 28.31 |
| | Average 2018-2020 | 33.14 | 33.28 |

District 1 2018-2020 Average

- The distribution represent hypothetical utilities with the same operating conditions
- The distribution response times ranging from a low of 27 minutes to around 31 minutes.
- It is highly unlikely for any utility with the same conditions as district 1 to achieve actual response times of less than 27 minutes or greater than 31 minutes.
- Most will be around 28.69 minutes, with about half faster and about half slower.



Menu of Target Options

- Model expected target is PSE’s best estimate of “true”, albeit unknown, industry expectation
- CI’s tell us how confident we are that a district is beating that unknown “true” industry expectation.

| Performance Level | District 1 | Actual | District 2 | Actual | District 3 | Actual |
|---------------------------|-------------------|--------|-------------------|--------|-------------------|--------|
| | 2018 | 31.42 | 2018 | 31.53 | 2018 | 33.58 |
| | 2019 | 29.09 | 2019 | 29.48 | 2019 | 28.47 |
| | 2020 YTD | 23.10 | 2020 YTD | 28.16 | 2020 YTD | 27.85 |
| Actual Response Time | Average 2018-2020 | 27.87 | Average 2018-2020 | 29.72 | Average 2018-2020 | 29.97 |
| Model Expected | Average 2018-2020 | 28.69 | Average 2018-2020 | 30.28 | Average 2018-2020 | 30.28 |
| | | | | | | |
| 85% Statistical CI Target | Recommended | 27.09 | | 29.11 | | 28.78 |

- Recent response time (i.e. 2020) show favorable performance versus recommended targets.
- Consistent with study recommendation.