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PUC PROJECT NO. 52771

INVESTIGATION INTO USE OF DYNAMIC LINE RATINGS FOR TRANSMISSION LINES IN TEXAS	**§ § §**	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

TEXAS INDUSTRIAL ENERGY CONSUMERS' COMMENTS

I. INTRODUCTION

As a trade association representing large, energy intensive businesses, Texas Industrial Energy Consumers (TIEC) appreciates the Commission's effort to maximize the use of existing transmission infrastructure through dynamic line ratings.[1] TIEC has historically supported similar operational approaches to fully utilize available transmission capacity through Remedial Action Schemes that allow specific transmission lines to load at higher levels in certain scenarios, subject to a contingency plan.[2] In theory, Dynamic Line Rating technology (DLR) could also expand the efficient use of existing transmission capacity and create significant congestion cost savings for customers. Certain DLR approaches have shown great promise for reducing transmission congestion in pilot programs throughout the United States and internationally.[3] However, DLR is a broad umbrella that covers many different approaches to real-time monitoring of transmission line capacity,[4] and the benefits achieved in certain limited pilot studies may not universally translate. As a result, TIEC seeks further detail on specific DLR technologies that may be applied,

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[1] The IMM reported in its 2019 state of the Market report that transmission costs doubled since 2012. *Reports of the Independent Market Monitor for the ERCOT Region*, Docket No. 34677, 2019 State of the Market Report at 30 (May 29, 2020) (available at: http://interchange.puc.texas.gov/Documents/34677_17_1068546.PDF).

[2] The ERCOT Protocols defines Remedial Action Schemes as:
A scheme designed to detect predetermined ERCOT System conditions and automatically take corrective actions on areas of the ERCOT System that are part of the Bulk Electric System, as that term is defined in the North American Electric Reliability Corporation (NERC) Glossary of Terms Used in NERC Reliability Standards. These corrective actions include, but are not limited to, adjusting or tripping generation (MW and MVAr), tripping Load, or reconfiguring a System(s) to maintain a secure system. RASs do not include under-frequency or under voltage Load shedding, the isolation of fault conditions, or out-of-step relaying (not designed as an integral part of an RAS).

[3] U.S. Department of Energy, Dynamic Line Rating Report to Congress ("DOE Dynamic Line Rating Report") at 25-26 (June 2019) (available at: https://www.energy.gov/sites/prod/files/2019/08/f66/Congressional_DLR_Report_June2019_final_508_0.pdf).

[4] DLR can be based on many different methods of measuring ambient conditions and line performance to determine how close a transmission asset is to its thermal limits. This can involve monitoring general weather conditions such as wind, cloud cover, solar irradiance intensity, or precipitation. DLRs can also be based on real-time measurement of wind cooling, line tension, conductor temperatures, line sag, and other indicators of a line's performance.

and their costs and benefits, to fully evaluate the net savings that might be achieved for customers in the ERCOT market.

As TIEC understands it, DLR technology is designed to reduce congestion by accurately tracking weather-related transmission line conditions in real time and allowing lines to be loaded closer to their actual thermal limits based on this information. The benefits of DLR relative to the technology costs will vary considerably depending on the topology where DLR is applied. To that end, DLR implementation should begin with a study of the benefits on specific transmission elements. For instance, DLR technology would not necessarily increase the performance of lines that currently experience very little congestion. Similarly, some transmission elements may reach other operational limits before thermal load becomes a driving constraint. This can occur on certain longer transmission lines where the maximum carrying capacity is increasingly determined by the voltage or frequency of the line rather than thermal limits.[5] In this instance, there may be reduced benefits of tracking thermal limits in real time relative to technology costs. Accordingly, TIEC believes that a case-by-case approach to DLR is likely warranted, rather than a blanket implementation.

That said, TIEC supports exploring implementation of DLR in instances where a study demonstrates that the anticipated benefits to consumers outweigh the technology expense. This approach is consistent with the intent of PURA § 37.056(d), which requires the Commission to evaluate transmission investments based on "a comparison of the estimated cost of the transmission project for consumers and the estimated congestion cost savings for consumers that may result from the transmission project." Generally, DLR applications that meet this consumer impact test should be pursued.

Importantly, the Commission does not need to create additional financial incentives for utilities to implement DLR. The existing transmission cost recovery scheme in ERCOT provides timely cost recovery of transmission investments with very limited regulatory lag.[6] In particular, annual interim TCOS adjustments provide a generous, timely recovery mechanism that allows

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[5] U.S. Department of Energy, Dynamic Line Rating Report to Congress ("DOE Dynamic Line Rating Report") at 23-24 (June 2019) (available at: https://www.energy.gov/sites/prod/files/2019/08/f66/Congressional_DLR_Report_June2019_final_508_0.pdf).

[6] 16 Tex. Admin. Code § 25.192.

utilities to begin recovering transmission investment—and earning a return on that investment—outside of a full rate case and before the Commission conducts a prudence review. These generous transmission cost recovery tools have led to multiple ERCOT TSPs being sold at premium values in recent years. There is no reason to make transmission cost recovery even more generous to facilitate DLR technology.

With this general context, TIEC provides the following responses to selected questions below.

II. COMMENTS

5. Are there drawbacks or benefits to utilizing this technology in the ERCOT market?

While TIEC generally supports the theory behind DLR technology, it comes at a cost that must be weighed against the potential benefits on an element-specific basis. On one hand, pilot programs have shown that DLR technology could provide substantial congestion cost savings to customers and increase the efficiency of existing transmission assets. Line ratings are frequently calculated using conservative assumptions about a transmission line's current carrying capacity without taking real-time conditions into account. As such, DLR technology could help alleviate congestion on certain transmission elements by allowing lines to be loaded closer to their actual carrying capacity, increasing the consumer benefits of existing infrastructure.

On the other hand, DLR applications may create reliability risks in certain by operating transmission assets closer to their thermal limits, reducing the margin of error and increasing the risk of outages or equipment damage if a DLR sensor malfunctions or a transmission operator "gets it wrong." There are also costs involved in implementing DLR, which can be significant.[7] Consequently, TIEC believes that element-specific evaluations are needed to ensure that the benefits of DLR exceed the risks and costs.

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[7] *See* DOE Dynamic Line Rating Report at 22 (explaining that a study projected that installing commercially available DLR systems on a 22-mile 345 kV transmission line would cost $500,000).

6. Do the current rate structures in ERCOT reward/encourage grid investments such as DLR?

Current rate structures are more than sufficient to support transmission system investments like DLR, and there is no need for the Commission to add any further incentives to encourage DLR deployment. Utilities will be able to recover DLR investments in a timely manner through interim TCOS updates, subject to a future prudence review.[8] The opportunity to increase transmission rate base should be sufficient to incentivize utilities to implement DLR on their existing transmission assets where it is cost-effective and prudent. TCOS updates virtually eliminate regulatory lag for transmission utilities and provide other ratemaking treatment that boosts utility returns between rate cases. Existing ratemaking tools, and the regulatory obligation to provide reliability to customers and the lowest reasonable cost,[9] should provide sufficient incentive for utilities to adopt DLR technologies where appropriate.

8. Will widespread utilization of this technology exacerbate other constraints on the system?

As noted above, an element-specific evaluation of DLR technology is needed to assess the impact of widespread deployment; however, it is possible that alleviating congestion in certain areas through DLR could exacerbate other constraints by essentially changing the transmission topology. Transmission utilities and likely ERCOT will need to study whether increasing flows on a particular line through DLR could create new constraints on other facilities, and this type of evaluation should be taken into account when determining whether it is cost-effective to install DLR under a particular scenario. It is unlikely that customers will benefit from simply moving congestion from one location to another. Therefore, DLR applications will need to be targeted and account for the limitations of interconnected transmission facilities.

9. Should this technology be included in all new high voltage lines within ERCOT?

DLR technology should only be installed on transmission elements where it is projected to provide congestion cost savings to customers that outweigh the associated costs. As noted above, there may be scenarios where DLR technology would add costs but not value for customers—for

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[8] TAC § 25.192 (h).
[9] *E.g.* PURA §§ 11.002(a), 31.001(a).

instance, where a line does not have significant congestion that could be mitigated by DLR, or where other operating limits will be reached before thermal load becomes an issue. As such, there should not be a generalized mandate to install DLR on all new transmission lines without an element-specific evaluation of the costs and benefits.

III. CONCLUSION

TIEC's comments are based on the current understanding of DLR technologies, and TIEC values the opportunity to review comments by others to further develop its position. TIEC appreciates the opportunity to respond to the Commission's questions and looks forward to further participating in this project as it advances.

Respectfully submitted,

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ATTORNEYS FOR TEXAS INDUSTRIAL ENERGY CONSUMERS

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Executive Summary

- TIEC is generally supportive of DLR and believes it presents a promising option to more efficiently use existing transmission infrastructure and reduce congestion costs for consumers.
- Utilities and potentially ERCOT should study whether installing DLR makes sense on a line-by-line basis, considering factors such as anticipated congestion cost savings, the cost of installing DLR technology, and potential reliability impacts on interconnected transmission facilities.
- TIEC supports the implementation of DLR in instances where a study demonstrates that the anticipated benefits to consumers outweigh the technology expense. Generally, DLR applications that meet this consumer impact test should be pursued.
- Existing ratemaking tools and regulatory requirements should provide sufficient incentive for utilities to deploy DLR. No further ratemaking incentives are necessary or appropriate.