



## Luminant Energy Tyler 345/138 kV Autotransformer Project Comment Form

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Oncor Electric Delivery (Oncor) supports Luminant Energy's (Luminant) proposal for an additional 345/138 kV autotransformer in the Tyler Area. In addition to the contingency discussed in Luminant's proposal, there are other contingencies of concern. The system protection relays on the Martin Lake – Shamburger 345 kV line will remove both the line and the 345/138 kV autotransformer at Shamburger from service for a fault on the line or in the autotransformer. This contingency during summer 2009 conditions will cause a 102% loading on the Elkton 345/138 kV autotransformer. The outage of the Shamburger autotransformer with the 345 kV line in service will load the Elkton autotransformer to 99% of its emergency rating.

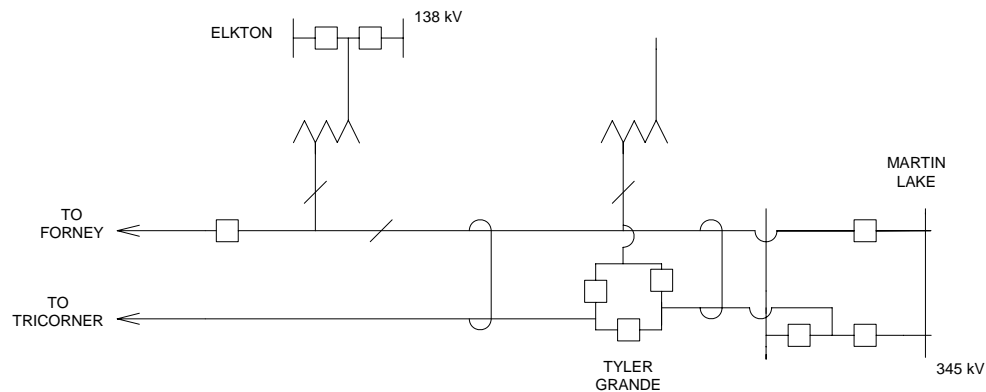
The projected 2009 summer peak load for the Tyler Area is about 745 MW. This area is served by the 345/138 kV autotransformers at Elkton and Shamburger, five 138 kV lines and one 69 kV line. If 345/138 kV autotransformers are out of service concurrently during summer load conditions, multiple 138 kV and 69 kV lines will overload as much as 198%, and the voltage will drop to the point of most likely causing a local voltage collapse. The 138 kV and 69 kV systems can support only about 50% of the load in the area.

The City of Tyler is encircled by 138 kV lines. The 138 kV loop is supported by the 345/138 kV autotransformer at Elkton on the southwest and the 345/138 kV autotransformer at Shamburger on the northeast. The proposed location for the third autotransformer is the southeastern part of the City under a 345 kV line from Martin Lake. Oncor believes the reliability to be gained by placing the third autotransformer in a location different from the existing autotransformers is justified by the extremely serious impact of losing the existing two autotransformers concurrently. The original proposed location was to be the existing Tyler SE Switching Station. The City has started a road widening project which will prevent the expansion of Tyler SE. Land is available near Tyler SE for a new switching station to be called Tyler Grande.

Oncor proposes using a spare 493 MVA autotransformer at Tyler Grande. Our studies indicate this autotransformer will be capable of withstanding the contingencies of concern. The outage of the Martin Lake – Elkton 345 kV line also removes the Elkton 345/138 kV autotransformer from service because the autotransformer is connected on the line side of the 345 kV breaker at Elkton (See diagram below.). Leaving this autotransformer out of service reduces the loading on the autotransformer at Tyler Grande because it prevents power from flowing through the autotransformers and 138 kV lines to get from Tyler Grande back to the 345 kV system at Elkton. The use of an existing autotransformer also reduces the cost of the project which will be discussed in detail later.



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Oncor's studies also identified the need to upgrade the capacity of the Tyler Grande (Tyler SE) – Tyler S 138 kV line. We propose rebuilding the line for double-circuit operation with one circuit being the through circuit from Tyler Grande to Elkton and the other circuit being a radial feed to Tyler S. This will eliminate rebuilding the 1.83-mile double-circuit loop into Tyler S. Rebuilding this loop is problematic due to the difficulty in transferring all of the load off of Tyler S to adjacent substations while the loop line is being rebuilt. The projected 2009 load at Tyler S is 41 MW.

Oncor's studies do not show a need to rebuild the Tyler NE – Tyler E 138 kV line. The line will overload prior to the installation of the 345/138 kV autotransformer at Tyler Grande, but it does not overload in our studies after the autotransformer is installed. Our studies do show a need to upgrade the Tyler GE to Tyler Omen Road 138 kV line after the autotransformer is installed to prevent overloads for the outage of the Martin Lake – Shamburger 345 kV line and the Shamburger 345/138 kV autotransformer.

Oncor estimates the cost to establish Tyler Grande Switching Station using the spare 345/138 kV autotransformer to be about \$14,337,000. This cost estimate includes the cost of constructing a new switching station to replace Tyler SE and connecting the existing 138 kV and 345 kV lines to the station. Using a new 600 MVA autotransformer instead of the existing spare autotransformer would raise the cost by about \$4,500,000.

The cost estimates to rebuild the Tyler Grande – Tyler S 138 kV line and upgrade the Tyler GE – Tyler Omen Road 138 kV line are \$2,750,000 and \$1,300,000, respectively.

Oncor proposes the establishment of the Tyler Grande Switching Station using the spare 345/138 kV autotransformer, the reconstruction of the Tyler Grande – Tyler S 138 kV line and the upgrade of the Tyler GE – Tyler Omen Road 138 kV line at a total estimated cost of approximately \$18,387,000 as an alternative to Luminant's proposal. This proposal will achieve the same results as the one proposed by Luminant at a lower capital cost.



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Oncor has performed additional load flow studies after we submitted our comments. These studies do indicate a potential overload of the Tyler NE – Tyler E 138 kV line following the outage of the Martin Lake – Elkton 345 kV line along with the Elkton 345/138 kV autotransformer plus the Martin Lake – Tyler Grande (Tyler SE) 345 kV line.

Studies involving reduced generation at Stryker Creek indicate increased loadings on the proposed Tyler Grande (Tyler SE) 345/138 kV autotransformer, the Tyler NE – Tyler E 138 kV line and the Shamburger – Tyler NW 138 kV line. Both the proposed 493 MVA autotransformer and the line will overload if only Stryker #1 is running.

We propose installing a 138 kV series reactor on the proposed Tyler Grande (Tyler SE) 345/138 kV autotransformer. The series reactor would cost approximately \$1,500,000 which is considerably less than the cost of a larger autotransformer.

The estimated cost to upgrade the Tyler NE – Tyler E 138 kV line and the Shamburger – Tyler NW 138 kV line are approximately \$1,900,000 and \$3,300,000, respectively.