April 5, 2024

Submitted via email

Re: Comments on the CETA Transmission Capacity Expansion Study request for input
to develop parameters for using advanced technologies

TS Conductor is submitting these comments in response to request for input to develop parameters for using advanced technologies and the proposed methodology used to evaluate conductor technology within the expansion study.[1] In our comments we outline additional parameters and use cases of advanced conductors which should be incorporated into the proposed methodologies for evaluating conductor technologies as transmission solutions.[2]

1. Reconductoring

Reconductoring is "appropriate" for ANY existing line where increased capacity (ampacity) is needed regardless of existing ampacity or system voltage. Limitations to fully rebuilding the line include excessive time for permitting, acquisition of additional rights-of-way (ROW), securing an outage, etc. Reconductoring with either conductor type would require a full rebuild unless the existing structures can handle the increase in thermal sag (exhibited by higher ampacity/steel core CTE), weight, and tension, all of which would be required using a larger ACSR and ACSS.

Reconductoring an ACSR line with TS Conductor can result in an increase up to three times the ampacity of the existing line without having to change out any or very few of the existing structures. In order to increase capacity of an existing ACSR line with a larger ACSR or similar sized ACSS, larger structures must be used and/or with shorter ruling spans, both in order to accommodate the higher thermal sag resulting from running the ACSR/ACSS at higher operating temperatures. But the CapEx savings are realized by not having to do a full line rebuild, thus leaving existing structures in place and using existing ROW.

2. Co-located New Build

For N-1 conditions, a system becomes overloaded to at or beyond its recommended load rating (beyond 100%). Using TS Conductor for the "alternate line or route" can remedy this situation thus increasing the reliability and resiliency of the system.
For example, most lines are designed using a ~50% load rating. In an N-1 condition for

[1] CETA Capacity Expansion Study, "Stakeholder Meeting #2 Summary," March 22, 2024, https://static1.squarespace.com/static/6390da3a799a023d4be2c27e/t/6605a202d0cdf905f23b05aa/1711645186168/Stakeholder+Meeting+%232+SUMMARY%2C+3.22.204.pdf.
[2] Transmission Expansion Study for Colorado, "Assessing the Need for Expanded Transmission Capacity," March 22, 2024, https://static1.squarespace.com/static/6390da3a799a023d4be2c27e/t/6604963fd91b6001393c1892/1711576642942/CETA+Stakeholder+Meeting+2+-+FINAL+-+3-22-24.pdf.

2 parallel lines, one line fails resulting in the line parallel to the failed line having to carry ALL of the current carried by BOTH conductors prior to failure. TS Conductor is a natural candidate for N-1 considerations as it routinely can provide two times the ampacity at a minimum. So, if Line 1 failed, Line 2 has to carry two times the ampacity, which is well within the capability of a given TS Conductor solution.

3. **Greenfield New Build**

It should be noted that any conductor would require additional voltage support (to accommodate the voltage drop) over long line lengths. This phenomenon is not dependent upon the core type of the conductor used. TS Conductor is currently being used by several TS customers for new build projects. The CapEx savings are realized when longer ruling spans and/or shorter, lower-grade rated structures can be used. This is due to the lower sag, lower galloping envelop, and improved heavy ice load characteristics of TS Conductor. In new build projects, structural component costs are roughly 30% or more of the overall project cost, while conductor costs are less than 5% of total project cost. Thus, large savings in CapEx are realized by using less structures and more than covers the modest premium for the TS Conductor.

4. **Advanced Conductor Rebuild**

As stated in section three, line compensation for voltage drop is not dependent upon core type of the conductor. Thus, it is a misnomer that advanced conductors should be considered only for lines less than 70-miles in length. The increased cost of adding capacitor banks to accommodate voltage drop are well below the cost of building a new line versus rebuilding the line. Similarly, the CapEx savings realized by longer spans and/or shorter structures still need to be considered, and more than covers the modest premium for TS Conductors.

Thank you,

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