

BADGER COULEE 345 kV TRANSMISSION LINE

AMERICAN TRANSMISSION COMPANY
WISCONSIN

COMPLETION DATE: DECEMBER 2018

TRANSMISSION LINE RESUME



Project Description:

Following over three years of studies and analysis, ATC determined that the Badger Coulee 345 kV Transmission Line is a multi-benefit project that improves electric system reliability, delivers economic savings for Wisconsin utilities and electric consumer, and expands infrastructure to support public policy for greater use of renewables. The ATC submitted the application for the project to the Public Service Commission of Wisconsin (PSCW) in October 2013. The Certificate of Public Convenience and Necessity was issued by the PSCW on April 23, 2015. Construction of the project began in Spring, 2016, and concluded at the end 2018. This project is a designated Multi-Value Project (MVP) by the Midcontinent Independent System Operator (MISO) because it enables the delivery of energy in support of reliability, economic, and public policy benefits.

The southern termination point of the project is located at the ATC Cardinal Substation in southern Wisconsin. An intermediate terminal is located at the North Madison Substation, also in southern Wisconsin. The northwestern termination point of the project is located at Xcel Energy's new Briggs Road Substation. The 180 mile route traversed seven counties in total throughout south and central Wisconsin.

The majority of the project utilized single pole tubular steel structures, however there were a few locations where H-Frames were installed in order to facilitate long river crossings or to keep the transmission line profile low. Approximately 65% of the line was single circuit 345 kV, however there were several sections of the project that double circuited existing 69 kV, 138 kV, or 161 kV lines, with even a short (< 1mile) triple circuit section comprised of another 345 kV line and 161 kV line. In total there were over 1000 structures installed on the project. There were several different conductor types utilized (ACSR, ZTACSR, and ACSS) throughout the project, however the main 345 kV circuit was comprised of a 2-bundle twisted pair 477 "Hawk" ACSR conductor. OPGW was also utilized on the entire project, with a fiber regeneration station being installed near the mid-point of the project route. The tubular steel structures were supported on several different foundation types, mainly

Key Facts and Highlights:

- 180 miles 345 kV EHV Transmission Line
- 2-Bundle Twisted Pair 477 "Hawk" Conductor with OPGW
- Tubular Steel Structures supported on Drilled Pier, Direct Embed and Micropile Foundations
- Five Year Public Involvement and Regulatory Review
- MISO Multi-Value Project



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reinforced drilled concrete piers and direct embed foundations, however in some of the coulee regions in the northwest portion of the project, micropile foundations were utilized. In total there were over 1,100 foundations installed.

ECI provided engineering and analysis to support the public and regulatory process. ECI performed route analysis covering the entire study area, including detailed routing, structure spotting, engineering review, estimating, and budget analysis. With the final route identified, ECI was responsible for complete detailed design, survey, construction staking, procurement support (specifications and review of project designs and shop drawings), engineering (field and office) support during construction and as-builts. ECI also managed the geotechnical and DOT specialty subcontractors on the project. ECI coordinated closely with other project stakeholders including Right-of-Way, Environmental, the construction contractor and Construction Management to successfully deliver the project. reinforced drilled concrete piers and direct embed foundations, however in some of the coulee regions in the northwest portion of the project, micropile foundations were utilized. In total there were over 1,100 foundations installed.

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