



Transmission Line Uprate

Considering uprating your existing transmission lines? Sargent & Lundy has the experience to help you develop the most cost-effective solution.

Increasing the capacity and reliability of the transmission grid has been a long-term objective for electric power industry engineers and system operators. Cost constraints, uncertainty with industry restructuring, and ever-increasing difficulties with transmission line permitting and acquisition of new right-of-way have caused transmission system capacity increases to lag far behind the increases in generating capacity.

In many cases, the best alternative to achieve additional transmission capacity is to upgrade existing facilities. As a leading engineering firm dedicated to the electric power industry for 115 years, Sargent & Lundy has been continually involved with transmission line upgrading projects, both to increase the power transfer capabilities and to improve reliability.

Technical Overview:

Uprating transmission circuits is accomplished by either increasing the current or converting the circuit to a higher voltage. A complete analysis of the benefits and costs associated with each option is required to achieve the desired project objectives as cost effectively as possible. Sargent & Lundy projects currently underway involve a variety of approaches to line upgrading. As indicated in the description of our current projects (See Services & Projects below), some options for transmission line uprating being implemented include:

- Real-time conductor monitoring devices - units that measure tension and systems that measure sag are both used as a means to determine if the conductor is within the allowable thermal range and the prescribed maximum sag so as not to cause any clearance infractions.
- Conductor types that provide increased ampacity with little or no increased structural loads - trapezoidal wire used in bare transmission conductors provide additional current carrying capacity with the same overall diameter as standard conductors. ACSS (aluminum conductor, steel-supported) uses annealed aluminum wires, allowing for higher operating temperatures without any loss of strength.

All aspects of transmission line design, including electrical and structural issues that are relevant to uprating projects, are covered in detail in the Sargent & Lundy Transmission Line Engineering Course. [Course outline and upcoming dates.](#)

In addition, the following technical papers provide a historical perspective of this topic spanning almost 30 years:

- [Repower Your Right-of-Way S. Cluts, December 1974](#)
- [Uprating Double-Circuit Transmission Lines 115 kV to 230 kV T. M. Sekili & G. U. Martinez, November 1982](#)
- [Uprating Transmission Lines K. Simpson, November 1990](#)

Call on Sargent & Lundy to help you jump-start the projects that will get the most out of your existing right-of-ways.

- [Transmission Line Uprating Services and Current Projects](#)

Upcoming Courses

Substation Engineering Course

May 5-8, 2008
Chattanooga, TN

November 3-6, 2008
Chicago, IL

Transmission Line Engineering Course

November 10-13, 2008
Chicago, IL

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