

ABSTRACT SUBMISSION

Title:
Transmission Lines Above 700kV – an overview

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Once high-voltage ac power transmission became feasible in the early twentieth century, there arose a continuing trend toward the use of increasingly higher voltages for transmitting large blocks of power efficiently over long distances. Higher-voltage transmission lines were also essential for the development of large interconnected power networks, one of the most important engineering achievements of the twentieth century. The growth continued with the introduction of transmission voltages of 500 kV in the early 1960s and 700-800 kV in the mid-1960s. The first 735-kV transmission lines were built by Hydro-Québec in 1965. Although efforts continued to establish the technical feasibility of power transmission in the range of 1000-1500 kV, practical implementation of transmission systems at these voltages was not feasible because of a steady decline in load growth following the energy crisis that began in 1973. Since the mid-1960s, transmission lines in the range of 700-800 kV were designed, built, and operated in several countries. Some of these lines have been in operation for 20-40 years, while others have been built more recently and in operation for only a few years. There are indications that more transmission lines will be constructed in the 700-800 kV range in many countries, and consequently, there is a need for information on the experience so far on the design, construction, operation, and maintenance aspects of lines at voltages above 700 kV.

The paper covers a review of the research and development efforts that were undertaken for the purpose of obtaining the data required for the design and construction of 700-800 kV and 1000-1200 kV transmission lines, followed by case studies of nine 700-800 kV and two 1000-1200 kV lines. Finally, a summary is provided.