

DOVER-MUSKEG RIVER TRANSMISSION LINE



ATCO Electric
Edmonton, Alberta

Sargent & Lundy Services:

- Transmission Line Engineering & Design (PLS-CADD)
- Foundation Design

The Dover – Muskeg River 260-kV Transmission Line Project was completed for ATCO Electric of Edmonton, Alberta, Canada, to provide additional transmission capacity between the mining areas of northern Alberta and the population centers of the central and southern areas of the province. The project consists of 31 miles of double-circuit and 12 miles of single-circuit transmission line.



Originating at the Dover Substation near Fort MacKay, Alberta, the line passes through an extensive area of muskeg soil conditions and crosses several rivers. The muskeg consisted of layers of peat that were as much as 18 feet deep, providing insufficient support for the types of foundations typically used for transmission structures. Underlying the muskeg were Alberta tar-sands, which required that the foundations be designed to accommodate localized ground heaving and subsidence associated with the steam-injection methods

used to extract oil.

The double-circuit portion of the line was constructed on steel lattice towers and the single-circuit section on wood H-frames. The conductors are a bundle of 2-795 kcmil Drake ACSR per phase. Screw anchors were drilled into the tar-sands underlying the muskeg to support the tower legs. The Athabasca River crossing required a 2,000-foot span and a specially designed system to provide navigation lighting on the crossing towers.

The engineering was completed by a joint venture of Sargent & Lundy LLC, Chicago, IL and GKO (Stantec) of Edmonton, Alberta, Canada. Sargent & Lundy's scope of work included finalizing the centerline alignment, optimizing the line design using PLS-CADD, designing the foundations, specifying all hardware, and providing technical support during construction.

Engineering was initiated in October 2001 and the project was completed in July 2002. Much of the project site was accessible only during winter by ice-bridge and frozen muskeg. Therefore, the design and material procurement schedule was compressed to allow construction to be completed within window of time when temperatures are consistently low enough to maintain safe passage or heavy equipment.

