NOKIAN CAPACITORS

NC CASE

Nokian Capacitors´ Series Capacitor Bank improves electrical power transmission to Montreal

Nokian Capacitors has delivered three 735 kV Series Capacitor banks to Hydro Québec, Canada. The contract was received in April 1990 and the Series Capacitor banks were taken to commercial operation in 1992. The delivery was done in co-operation with Siemens.

The Series Capacitors are located at Montagnais substation connected in the long 735 kV transmission lines. The transmission lines transmit the electricity from Churchill Falls hydro power plant to Montreal and further to the USA. The Series Capacitors increase the power transmission capability of the transmission system and improve the system stability. Montagnais substation is located far north from Quebec city. There is no road to the substation, access is only by railway of the mining company or by airplane to the substation´s own airfield. Because of this, the reliability and availability requirements of the Series Capacitors at Montagnais substation are very strict.

Nokian Capacitors can take care of the complete service and maintenance of installed products.

Montagnais 735 kV Series Capacitors bank

Nokian Capacitors has long time experience in the design and delivery of high voltage Series Capacitors to different countries and extreme ambient conditions. In Finland the first Series Capacitor delivery was done in 1964. Nokian Capacitors had delivered to Canada (British Colombia Hydro and Power Authority) many Series Capacitor banks for the 500 kV system. Some of these banks had been in successful operation in severe temperatures from -50°C to +40°C already for 20 years. Nokian Capacitors has also delivered to Hydro Quebec in 1978, 350 Mvar filter bank, which was directly connected to the 735 kV voltage line. With this deli-very Nokian Capacitors had already designed and tested the equipment for the 735 kV line voltage including the fiber optic signal transmission system.

Scope of the delivery

The scope of delivery included all fixed series equipment except the bypass breakers and isolators, which Hydro Québec supplied. Nokian Capacitors designed all the high voltage equipment (capacitors, damping circuits, spark gaps, platform level electronics, fiber optic signal transmission system etc.). Siemens designed the MOV and the control cabinet. Some of the equipment was bought from Québec by Siemens Electric Ltd (Québec), according to Nokian Capacitors´ design and specifications (for instance the steel platforms).

Technical data for one 3-phase bank

Line voltage	735 kV
Rated power (3-phase)	476 Mvar
Rated current	2300 A
Rated reactance	36 ohm
Protective level	2.6 pu = 254 kVpeak
Forced triggered spark gap	
Duplicated fibre optic signal transmission system	
MOV energy	44 MJ
Number of banks	3 pcs

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