RESUME

The rapid development and expansion of power systems network has demanded increasing use of EHV and UHV transmission lines. The reliability of insulation between terminals of circuit breakers and disconnectors known as longitudinal insulation is most important for the system reliability, Failure of longitudinal insulation is defined as a major failure of the equipment.

The reliability of the equipment can be guaranteed better when exact site conditions of the equipment is simulated in the laboratory while conducting dielectric withstand tests on longitudinal insulation. This dissertation presents various aspects which requires to give important considerations while conducting bias voltage test on longitudinal insulation. It seems the location of damping resistor in the bias test circuit governs the reliability of the test results.

The flashover voltages of external insuation vary with the change of atmospheric parameters. For this reason these effects must be taken into considerations in the design/ performance of the switchgears. Theinfluence of humidity under bias voltagers is studied and suitable humidity correction factors have been recommended in this thesis.

Further, the influence of AC corona, time shift between two peaks, time-to-crest of the impulse wave and influence of rain under bias voltages is also discussed in this thesis.