

Chapter I

INTRODUCTION



At present high voltage testing technique requires four kinds of high voltage supply

(a) Power - frequency alternating voltages up to 1000 - 2000 kilovolts usually 50 to 150 cps.

(b) Constant direct voltages

(c) High - frequency alternating voltages up to about 1000 kilovolts at about 100 - 200 kilocycles

(d) Surge or impulse voltages up to about 1000 kilovolts or more and duration a few micro - or milli - seconds.

Type (a) is most common and is in the scope of this thesis, being applied to routine tests of materials, machines and apparatus and also for use in connection with Schering bridge measurement. The high voltage switching impulses of type (d) may be generated from cascaded testing transformers by suddenly energizing the transformers for a short period of time.

The design and construction of high voltage testing transformers used in a power frequency testing plants depend on the service conditions, which will usually be such as to involve intermittent use, with high voltage discharges on the output side amounting to a partial short circuit. A typical arrangement of a power frequency testing plant is shown in Fig 1.

Basic Diagram of a Power Frequency Test System

- | | | | |
|---|--|---|---|
| 1 | Regulating transformer, motor generator set resp. | 5 | Test object |
| 2 | Compensating reactor | 6 | Peak voltage meter (reading also r.m.s. values) |
| 3 | Test transformer with cascade winding (ground unit of the cascade) | 7 | Sphere-gap with damping resistor and overcurrent relay in the ground lead |
| 4 | Test transformer on insulating base (line unit of the cascade) | 8 | Control desk |

