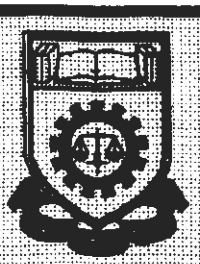
CONSTRUCTION, TESTING AND COMMISSIONING OF A 60 kV DOUBLE STAGE MARX GENERATOR

Thesis is presented in partial fulfilment for the award of the Advanced Diploma in Electrical Engineering of INSTITUT TEKNOLOGI MARA



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Abstract

The main objective of this project is to complete the construction work of a 60 kV Multistage Marx Generator with a waveshape of 4/400 μ sec, for the proposed High Voltage Engineering Laboratory in the Department of Electrical Engineering, ITM Shah Alam. The Marx Generator is basically applied a method where capacitors to be charged in parallel and discharged in series through a set of sparkgap. Normally with an input of a few kilovolts of dc voltage, this generator will generate an impulse voltage in the range of hundreds of kilovolts or higher. The generated impulse voltage waveform consists of two parts, the wavefront and the wavetail. The duration of waveshape are usually depend on the values the wavefront and wavetail resistor respectively. The construction work of this generator was carried out based on the existing design with some modification, especially in the values and the arrangement of the components.

1.0 INTRODUCTION

An impulse voltage generator is a high voltage engineering laboratory instrument which was developed to generate an impulse voltage. Normally, with an input of a few kilovolts of dc, this generator will generate an impulse voltage in the range of hundreds of kilovolts or higher. The impulse voltage being generated are mainly used in the product testing and research activities in the production and development of the high voltage engineering equipments. The needs of performing the product testing is to ensure the safety of the equipments and also to confirm whether it complies with the production specifications and standards especially in the testing of the strength of the insulation materials used. As in the research activities, the newly developed high voltage engineering equipments can be tested with the generated impulse voltage for the purpose of observing the behavior and the characteristic of the equipments as well as its insulation due to lightning surge or switching phenomena. The block diagram of the generator is as shown in Figure 1.

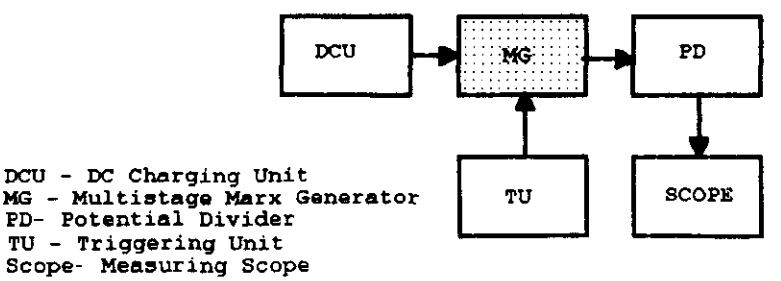

Figure 1. Block Diagram of the Multistage Marx Generator