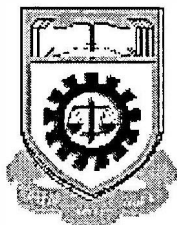


# **INTERLOCKING SYSTEM FOR HIGH VOLTAGE PULSED POWER LABORATORY**

This thesis is presented in partial fulfilment for the award of the Bachelor in Electrical  
Engineering (Hons.) of Institut Teknologi MARA.



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## ***ABSTRACT***

*The Pulsed Power Laboratory of Faculty of Electrical Engineering, ITM Shah Alam is operating without interlocking system. The tests done in this laboratory are not safe due to the voltage that can be produced by the equipment is up to 200kV and impulse current can be up to 15kA. As protection against electrical accidents, interlocking system is needed to cut off the high voltage power supply.*

*Interlocking system comprising of sensor, controller and relay. Sensor is used to sense the opened door and is installed on the second entrance of Pulsed Power Laboratory and the relay served as a switch.*

*The main objective of this project is to design the controller for the interlocking system, which is based on electronic circuit (replacing power circuit suggested by Kind [1]) to ensure the power supply of the high voltage system is still in off condition when someone opens second entrance of the laboratory. A DC power supply is designed and employed in the interlocking system. In this project two types of controllers, Delay Timer and Latch-up Switch are designed. However one controller is used at a time.*

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# INTERLOCKING SYSTEM FOR HIGH VOLTAGE PULSED POWER LABORATORY

<u>CONTENTS</u>	<u>PAGE NUMBER</u>
<b>Abstract</b>	
<b>Acknowledgement</b>	<b>ii</b>
<b>Contents</b>	<b>iii</b>
<b>Terminologies Employed</b>	<b>vii</b>
 <b>CHAPTER 1</b>	
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>1.1 Literature Works</b>	<b>4</b>
<b>1.1.1 Power Supply</b>	<b>5</b>
<b>1.1.2 Control Circuit</b>	<b>6</b>
<b>1.2 Design Criteria of Interlocking System</b>	<b>8</b>
<b>1.3 Scope of Works</b>	<b>9</b>
 <b>CHAPTER 2</b>	
<b>2.0 * PRINCIPLE OF OPERATION</b>	<b>10</b>
<b>2.1 Logic Control</b>	<b>11</b>
<b>2.2 Interlocking System Circuit</b>	<b>12</b>
<b>2.2.1 Sensors</b>	<b>14</b>
<b>2.2.2 Controllers</b>	<b>14</b>
<b>2.2.3 Relay</b>	<b>14</b>

# CHAPTER 1

## 1.0 INTRODUCTION

In the Pulsed Power Laboratory of Faculty of Electrical Engineering, ITM Shah Alam, impulse voltages are required in high voltage tests to simulate the stresses due to external and internal over voltages and also for fundamental investigations of the breakdown mechanisms. Impulse voltages are generated by discharging high voltage capacitors through switching gaps onto a network of resistors and capacitors, and in a few cases, voltage multiplier circuits are used.

Figure 1.1 shows the high voltage and high current equipment, which placed in the testing area of Pulsed Power Laboratory. The tests are very dangerous because of the voltage that can be produced by the equipment is up to 200kV and impulse current can be up to 15kA. This called for a safety device and proper practice. In this project, interlocking system is used as a safety device for the laboratory.

As protection against electrical accidents, the safety circuit (interlocking system) effects switch-off the testing transformer for interruption of any series connected safety circuit switches. Interlocking system is needed to cut off high voltage power supply when a person enters the testing area, while testing is in progress or high voltage is energised.