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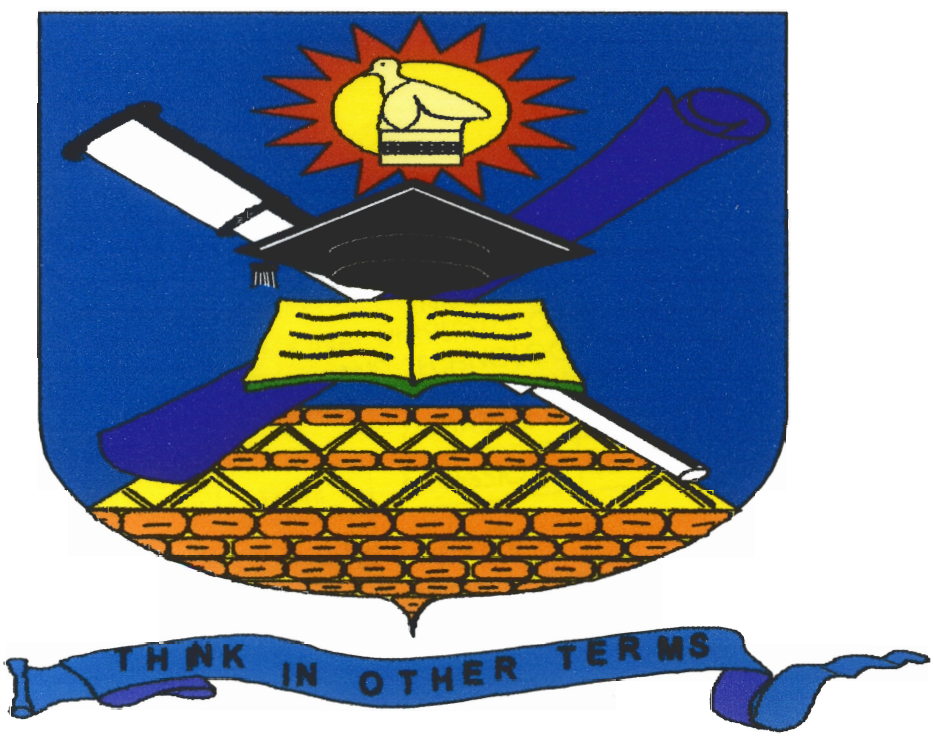

RESEARCH PROJECT PART V

TOPIC: COOLING WATER TREATMENT

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This research project is submitted in part fulfillment of the requirements of the Bachelor of Engineering (Honours) Degree in Chemical Engineering

CHAPTER 1

1.0. Introduction

Cooling water systems relying on cooling towers and heat exchangers are a critical component at chemical process industries (CPI) facilities. Cooling water is used indirectly to cool process fluids through heat exchangers and cooling towers. Generally, the demand for cooling water in industrial plants is high. As the availability of freshwater has started to shrink and plant sites have continued to grow, it has become more of a challenge to access a broad array of freshwater sources[1]. In order to reduce water requirements of cooling systems, there has been a change from once through to recirculating cooling systems and reduction of blowdown by increasing cycles of concentration.

Such effective utilization of cooling water concentrates dissolved solids thus resulting in frequent problems with corrosion, scale and biofouling in cooling water systems[2]. Various cooling water treatment technologies are used to prevent these problems. The development of these technologies has realized more effective utilization of cooling water.

A critical component of efficient cooling water system operation is water treatment, which significantly reduces water consumption. The main objectives of cooling water treatment are:

- To minimize scale.
- To minimize corrosion.
- To minimize biofouling.
- To maximize safety of personnel.
- To maximize efficiency of the process.

Cooling water systems require proper chemistry control and monitoring.