

1-1 INTRODUCTION

All living things depend on energy for survival, and modern civilizations will continue to thrive only if existing sources of energy can be developed to meet the growing demands. Energy exists in many forms, from the energy locked in the atoms of matter itself to the intense radiant energy emitted by the sun. Many sources of energy exist, many are known, some perhaps unknown but when an energy source exists means must first is found to transform the energy into a form convenient to our purpose.

The chemical energy of combustion of fossil fuels(oil, coal, gas),and waste (agricultural, industrial, domestic), is used to produce heat which in turn is used to provide mechanical energy in turbines or reciprocating engines; uranium atoms are bombarded asunder and the nuclear energy released is used as heat; the potential energy of large masses of water is converted into electrical energy as it passes through water turbines on its way from the mountains to the sea; the kinetic energy of the wind is harnessed by windmills to produce electricity, the energy of the waves of the sea is converted into electrical power in floating turbines, the tides produced by rotation of the moon produce electrical energy by flowing through turbines in large river estuaries, hot rocks and trapped liquids in the depths of the earth are made to release their energy to be converted to electricity, the

immense radiant energy of the sun is trapped to heat water or by suitable device is converted directly into electricity.

Dr Shareif power station suffering power losses from boilers, turbines and their auxiliary. Radiation and convection some of these losses and must be minimized to improving the efficiency of boiler and station efficiency.

1-2 The Research

One area for efficiency improvement is heat loss through deteriorating boiler wall insulation the breakdown and failure of wall insulation is mostly due to age and weathering.

The losses can be significant depending on the location and size of the insulation breakdown as well as environmental factors such as wind and temperature.

1-3 Problems

Due to deterioration on boiler thermal insulation boiler efficiency decrease and fuel consumption will increase.

1-4 Research Objectives

Improve boiler efficiency by reduce heat losses due to radiation & convection.

1-5 Research Methodology

Collecting data from Khartoum North Power Station and Calculate boiler heat losses throw thermal insulation and calculate optimum insulation thickness.

Calculate pay back if we repair the boiler thermal insulation.