VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELGAUM, KARNATAKA.

A Project Report

DESIGN AND FABRICATION OF SOLAR THERMAL PUMP (KSCST COPY)

Submitted in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF ENGINEERING

In

MECHANICAL ENGINEERING

By

SUBRAYA KRISHNA BHAT	**USN: 4SO10ME105**
SRINIDHI S	**USN: 4SO10ME103**
RITHESH H.S	**USN: 4SO10ME089**
RAGHUVEER RAO	**USN: 4SO10ME084**

Under the guidance of

Dr. RAJU K

Professor

MECHANICAL ENGINEERING DEPARTMENT

St. Joseph Engineering College

DEPARTMENT OF MECHANICAL ENGINEERING

(Accredited by NBA, New Delhi)

ST. JOSEPH ENGINEERING COLLEGE.

VAMANJOOR, MANGALORE (D.K.) – 575 028.

KARNATAKA

2013-2014

ABSTRACT

In the modern world the depletion of non-renewable sources of energy has led to the development in methods of harnessing non-conventional energy sources. There are various non-conventional sources of which solar energy is the most plentiful energy source for earth. According to research conducted by various experts, solar energy falls on the surface of the earth at a rate of 120×10^{15} watts. This means all the solar energy received from the sun in one day can satisfy the whole world's demand for more than 20 years! Thus harnessing this energy will be extremely helpful in improving the quality of life for many people around the world.

There are mainly two methods of harnessing solar energy. They are Photovoltaic method and Concentrated Solar Power. In this project Concentrated Solar Power technology is considered for utilizing solar energy. Here a parabolic dish type solar collector is used to collect solar energy and concentrate it at a single point (focal point). A thermally insulated solar receiver is fixed at this point which is filled with water. The receiver absorbs the concentrated solar energy and the heat developed is utilized to convert the water into steam. This steam is sent to the steam engine which produces rotary motion of the crank shaft. The steam engine is used to drive a simple reciprocating P.V.C. pump which inturn pumps the water.

By the end of this project we are able to concentrate solar energy at the focal point of the parabolic dish solar collector and achieve an average maximum temperature of 210°c at the focal point. Based on the tests conducted in the month of March and April, an average steam pressure of 4kg/$cm^2$was obtained in nearly 72mins in the time interval between 11.00am to 3.00pm. The steam pressure obtained is used to run a steam engine and inturn pump water. Hence this project eliminates the use of electricity for pumping of water.