

# **EXERGY ANALYSIS AND MATHEMATICAL MODELING FOR THE PERFORMANCE OF THERMAL POWER PLANT**

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by

**Niraj Himatbhai Kavad**

**150303210005**

Underthesupervisionof

**Asst.Prof.KrutenPatel**



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**DEPARTMENT OFMECHANICALENGINEERING**

**PARUL INSTITUTE OF ENGINEERING**

**&TECHNOLOGYFACULTYOFENGINEERING**

**&TECHNOLOGY**

**PARUL UNIVERSITY**

**P.O.Limda -391 760,GUJARAT,INDIA**

## Abstract

Exergy is more specific and accurate parameter by which the performance of any system can be evaluated. In this study, the exergy analysis of Wanakbori Thermal Power plant is presented. The primary objective of this study is to analyze the system components separately and to identify and quantify the sites having largest exergy losses for the full load as well as for the part load condition of the thermal power plant. The performance of the plant was estimated by a componentwise modeling and a detailed break-up of exergy losses for the considered plant. The boiler is the major source of irreversibility in the power plant amongst all other components but excluding the boiler, turbine is the highest exergy destruction component. So exergy destruction improvement techniques are also evaluated for the turbine in this study. Mathematical modeling of power plant performance is also carried out for this particular thermal power plant, which enables us to find out the significant parameters which affect the most to the performance of the turbine and also provide the information for the given particular operating condition of the power plant.