

Review Report Of
**COUPLED THERMAL-STRUCTURAL ANALYSIS OF GAS
TURBINE BLADE**

A thesis submitted in the partial fulfillment of the requirement for the award for the degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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CERTIFICATE

This is to certify that project report is entitled “**COUPLED THERMAL-STRUCTURAL ANALYSIS OF GAS TURBINE BLADE**” was carried out by **P.UMA MANIKANTA (17811A0349), G.SURESH (17811A0316), R.SRINU (17811A0351), B.SWAMY (17811A0308)** in partial fulfilment of requirements for the award of the degree of bachelor of technology in “**MECHANICAL ENGINEERING**” by Jawaharlal Nehru Technological university , Kakinada During the years 2017-2021.

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EXTERNAL EXAMINER

ABSTRACT

The analysis of stress values that are produced while the turbine is running is the key area of study while designing the next generation steam or jet turbines. Hot section blades typically fail because of high pressurized gas which is imposed on these blades. These blades need replacement at regular overhauling's inspite of their condition after completion of specified running duration. The temperature gradients that can be established are usually higher. The gas turbine consists of blades and vanes, which are subjected to very high thermal and mechanical stresses (combined effects of centrifugal force and thermal gradient) in aggressive environment. The research on gas turbine blade cooling systems is coupled with the flow and heat transfer associated with rotating turbine. This work is primarily focused on study of thermal stresses induced in the turbine blades. The design and coupled thermal-structural analysis of the turbine blade will be carried out using CATIA and ANSYS Workbench where the thermal stresses induced in the rotor blades will be studied for different heat resistant alloy materials. The best material to be employed is suggested based on the results obtained.

Keywords: Gas turbine Blade Analysis, Coupled thermal-structural analysis.