A Project Report On

# "Aerodynamic Performance and Heat Transfer for Cooling of a Turbine Blade Cascade"

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# ABSTRACT

Modern gas turbine blade cooling is an area of great research for scientist for several years. It requires higher turbine-entry gas temperature to improve their thermal efficiency and thereby their performance.the thermal stresses and loading is reduced by applying thermal barier coating and cooling on the surface of blade.

In present work experiments were performed to know the pressure distribution around a stationary tubine cascade for different velocities. In numerical study Cooling passages were created at various points along the aerofoil and they were analyzed for amount of heat removed by them and pressure drop they brought about also numerical simulation was carried out for flow past a square cylinder to see the wake behavior and heat transfer through a finite volume solution of the coupled differential equations for conservation of mass, momentum (navier stroke) and energy. A two dimensional unsteady flow past a circular and square cylinder has been investigated numerically for the Reynolds number (Re, 40 & 100) so that flow is laminar. The main objectives of this study were to capture the features of flows past a circular  A high resolution grid has been used to avoid spurious oscillations and to keep the errors within limits. The lift & drag coefficient and velocity component in the wake region,heat transfer around the surface,pressure distribution were monitored for calculation of Strouhal number and Nussult number. The interesting results are presented and are compared to corresponding measurement data as and when available,pressure distribution over turbine cascade is to be calculated