

279. STRAIN BASED FATIGUE LIFE ANALYSIS IN GAS TURBINE ROTOR BLADE

K. Nehru, Dr. R. Asokan
Aeronautical Engineering Department
Hindustan University
Chennai, India

nehru1991@gmail.com, rtifac@hindustanuniv.ac.in

The major failure problem in the gas turbine blade is fatigue due to the gas bending load because of high pressure, thermal load, and centrifugal load due to the engine rotational velocity. These variation due to the cyclic load acting in the blade at every time of starting and shutdown of the gas turbine engine. The cyclic load leads to high cycle fatigue and low cycle fatigue. High cyclic fatigue occurs when the yield strength is less than the von mises stress and the low cycle fatigue occur when the von mises stress is more than the yield strength. In this paper the low cycle fatigue which is the strain based life are calculated. The gas turbine blade was designed by using CATIA and fatigue life analysis is carried out in the ANSYS. The stress results and the plastic strain values are used to calculate the fatigue life of the blade.

Key words: High cycle fatigue, Low cycle fatigue, Turbine blade, Von mises stress.

Journal of Science and Innovative Engineering & Technology