

## **An Investigation of Multiaxial Loading and Plastic Deformations due to Fatigue of Different Materials**

**Dr. Pravin S. Nerkar<sup>1</sup>, Mr. Sanket J. Tawale<sup>2</sup>, Mr. Prachit P. Shrikhande<sup>3</sup>,  
Mr. Prajwal P. Pophale<sup>4</sup>**

<sup>1,2,3,4</sup> Mechanical Engineering Department,

St Vincent Pallotti College of Engineering and Technology, Nagpur-441108, Maharashtra, India

*\*Corresponding author Email: psnerkar@yahoo.co.in*

### **ABSTRACT**

Due to the lack of fatigue life prediction techniques which can effectively handle multiaxial loading, a reliable approach is to be consider for prediction of fatigue in stressed conditions. Fatigue life prediction under multiaxis random loading is an extremely complex and intractable phenomenon. A multiaxial fatigue failure criterion is need to be study. Predominant materials play an important role in estimating the remaining life of critical components. Fatigue is most common phenomenon of damaging metallic materials. Fatigue damage causes due to repetitive cyclic loading. Fatigue may results in cracks and crack grows in size at each load cycle and finally leads to fracture. Cracking is the first step in material defects. The multiplication of cracking phase and fatigue life are related to the density of strain energy. Fatigue damage is caused by the simultaneous effect of cyclic stress, tensile stress and plastic stress. Fatigue failure occurs due to multiaxial loading and plastic deformation were discuss. The review of different experiment carried by researchers on multiaxial loading and plastic deformation were studied, analysed and presented in this paper. This paper provide brief information on damage mechanism occurs in different materials. The purpose is to identify the effect causes due to multiaxial loading and plastic deformation on fatigue and develop an idea to increase a material resistance in various fatigue conditions.

*Keywords: Fatigue; multiaxial loading; strain energy; Plastic deformation*

International Conference on Advances in Minerals, Metals, Materials, Manufacturing and Modelling