

## **CONTACT FATIGUE ESTIMATION AND MATERIAL OPTIMISATION FOR WEAR OF CAM SHAFT FOR HIGH PRESSURE DIESEL PUMPS**

**RAKESH R.<sup>1</sup>, S. N. SHELKE<sup>2</sup> AND B. NAGABHUSHGANA<sup>3</sup>**

<sup>1</sup> Student, Mech. Dept., S V I T, Chincholi /UOP, Pune, India.

<sup>2</sup> H.O.D. Mech. Dept., S V I T, Chincholi /UOP, Pune, India.

<sup>3</sup> Director, Tejvi Tech Solutions. Bangalore, India.

### **Abstract**

Stress and deformation plays very important role in structure/machine design. Proper stress design prevents failure of structures and increases the life of the system. Due to the advances in computer based Finite element techniques, problems can be easily analyzed and designs can be changed to the requirements within short time. In this present work a cam-shaft assembly components are analyzed for stress and deformation conditions. Cam shaft is modeled and hex meshed for better accuracy using Hyper mesh. The meshed objects are imported and analyzed for structural safety conditions. Initially plunger loads are calculated for the given design specifications. Then the reaction loads are calculated which will act on the bearings through the cam shaft. Cam shaft is analyzed for the fatigue life due to the follower (plunger) loads. Ansys fatigue module is used for life estimation of the cam shaft under contact conditions. SN curve data is supplied as input and loads are applied on the cam lobes in six load steps. Each load step file is saved and the results are captured for individual load steps. The cumulative usage factor shows very near value of fatigue life suggesting a better material requirement for longer life. Contact pressure estimations are also carried out. This results shows a higher stress development indicating the requirement for high yield and tensile strength material to prevent wear out of the cam.

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**Keywords :** Fatigue failure, wear mechanism, Cyclic Load, cam & follower system

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