

ESTIMATION OF FATIGUE LIFE OF EOT CRANE'S BRIDGE GIRDER

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Abstract

The fatigue life of bridge girder is an important parameter in deciding the life of an EOT crane. Bridge girder is the structural member, which have to sustain whole of the variety of lifting, and trolley travel. More relevant cause of damage to a crane is, failure due to cyclic usage beyond its service life, that is, fatigue failure of the bridge girders. Loadings on the bridge girder during operation are not constant, hence it is not possible to assume constant cyclic load for the crane to determine its life. In this paper, an attempt has been made to estimate the fatigue life of bridge girder using Palmgren & Miner's rule¹. The variable loadings coming on the bridge girder at the exact loading points of a working crane and stress spectrums by reservoir counting method are presented using a MS EXCEL program. A working crane of class of duty 4 as per BIS "M8" commissioned in 1983 is selected for this. The input parameters for this particular crane are entered in the program and are checked against BIS standards. The fatigue life considering probabilistic survival of 97.5% comes out to be 25.68 years.

Keywords: Fatigue, Palmgren & Miner's rule, Reservoir counting method, S-N curves.