Abstract

A fractured in-service ship-propeller shaft (50.8 mm, i.e. 2-inches nominal diameter) was examined to determine the causes of failure and to recommend preventive measures to minimize the risk of recurrence. The findings of the failure analysis investigation suggest strongly that the shaft failed due to rotating bending fatigue initiated from the surface and close to the keyway area. The origin is located on a surface flaw (recess or dent) of approximately 100 μm depth, which could have probably being caused either during installation, operation or maintenance. In addition, scoring lines formed due to friction related processes and found on the journal surface, were considered as stress raisers acting as potential sites for fatigue crack initiation. Careful review of the shaft service conditions as well as the implementation of suitable inspection procedures adapted to the vessel planned maintenance are recommended as necessary corrective actions for failure prevention.