ABSTRACT

On the ship propeller shaft, if there are design errors, manufacturing defects, fatigue cracks because it will cause which might causes cracks. Cracks on the shaft which has been known to be given stress intensity immediate attention and be checked to determine the length and depth of the crack in the propeller shaft. With the absence of consideration of the techniques that have been proven or credible standard operating procedure to determine the crack depth in the propeller shaft so is it necessary to studies the elongated crack depth interpretation on propeller shaft using ultrasonic.

Study for crack depth determination conducted through ultrasonic testing experiments on 3 variations of diameter (100, 200 and 300 mm), two variations of elongated crack depth (2.5 and 5 mm) and 3 variations of 4 MHz probe angle (45 °, 60 °, 70 °). Simple modification on the probe shoe, calculate and making models of beam spread, modeling to interpret the depth of the crack itself. Having obtained the experimental results that have been analyzed, the highest accuracy level obtained for the variation of 100 and 200 mm diameter probe angle are 45 ° while the 300 mm diameter probe are 60 °. Discussion of the analysis results, in addition influenced by the characteristics of the probe itself (angle, frequency, crystal size), the level of accuracy of the probe was also influenced by the characteristics of the material to be inspected (diameter and crack depth). Each of incident angle on probe has a different ability to detect maximum cracks depth for different materials diameter.

The results from this study are obtainment of Maximum detectable Crack Depth effect within it's equation and Standard Operating Procedure (SOP) for the elongated crack depth interpretation on propeller shaft.

Keywords: Ultrasonic, Shafts, Probe Angle, Maximum Detectable Crack Depth, Standard Operating Procedures.
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