Fatigue Analysis of Yoke Arm External Turret Mooring System at FPSO (Floating Production Storage and Offloading)

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ABSTRACT

FPSO (Floating Production Storage and Offloading) is one type of offshore building that tend to fatigue due to environments load dominated by a cyclical wave. In this final project structure that studied is the yoke arm external turret mooring system at FPSO structure. Modeling was held to help determine the coordinates of each section to obtained the response of motion and tension on the mooring lines as the global modeling FPSO. It was found that each movement of the FPSO response has a value different characteristic in accordance with the direction of wave loading, but in the direction of loading analysis only used 180°. Because the floating structure that use an external turret mooring system has the ability to weathervane. While the local model are reviewed, namely yoke arm, held to locate the hot spot and its large stress. Using the method of Palmgren-Miner, by reviewing the ratio of cumulative damage (D) due to the load received by the structure, then the fatigue life of the yoke arm external mooring system FPSO is 141 years. So with the FPSO service life for 30 years, yoke arm of external turret mooring system at FPSO meets the required safety factor DnV is 3 (three).

Key Words: FPSO, external turret mooring system, yoke arm, fatigue.