عنوان مقاله:

Calculation and Analysis of Reliability with Consideration of Common Cause Failures (CCF) (Case Study: The Input of (the Dynamic Positioning System of a Submarine

محل انتشار:

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خلاصه مقاله:

The reliability and safety of any system is the most important qualitative characteristic of a system. This qualitative characteristic is of particular importance in systems whose functions are under various stresses such as high temperature, high speed, high pressure, etc. A considerable point, which is rarely taken into account when calculating the reliability and safety of systems, is the presence of dependency among subsystems, and this dependency causes various failures in a system, one of the most important of which is the common cause failure (CCF). Failing to consider common cause failures in the calculation of system reliabilities leads to optimistic estimations of system reliability rates, which results in too much trust in the system. In this paper, first, we deal with identifying the reliability of the input of a dynamic positioning system consisting of different environmental sensors and various positioning systems with the aid of PBS and FFBD techniques. Then, we will calculate and allocate the above-mentioned reliability with the aid of a RBD. The common cause failures of different subsystems are considered in calculating the reliability of the previously mentioned system with the aid of IEC 61508 standard, and then the degree of effectiveness of common cause failures in reliability of the studied system is obtained. Finally, by considering different assumptions for the system under study, it is proved that the less the amount of the reliability of dependent components is, the .higher the effectiveness of common cause failures in the system reliability will be

کلمات کلیدی:

Reliability,Dependent Failure, Common Cause Failure, Reliability Block Diagram, ynamic Positioning System