**سیویلیکا - ناشر تخصصی مقالات کنفرانس ها و ژورنال ها**
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## عنوان مقاله:

Time-variant Reliability Assessment of Hull Girder Ultimate Capacity of Corroding FPSO-A Case Study

## محل انتشار:

هفتمین همایش ملی صنایع دریایی ایران (سال: 1384)

تعداد صفحات اصل مقاله: 12

## نویسنده:

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## خلاصه مقاله:

The objective of this paper is to set up a reliability – based formulation for assessment of time-varying ultimate hull girder strength of corroding FPSO, the various sources of uncertainty influencing failure are described. Different SWLE (Still – Water Load Effects)'s models are described and the applicability of each model is presented in terms of annual failure probability , cumulative lifetime failure probability and annual hazard rate function. Load combination reduction factor method is applied to combine the two stochastic processes of SWLE and WILE (Wave – Induced Load Effect) . A semi – progressive collapse methods is applied to model a hull girder ultimate strength behavior subject to the vertical bending moment. Corrosion phenomena are accounted for in the formulation considering the decreased buckling capacity of the components induced by the corrosion wastage (Plate thinning). Furthermore, a response surface methodology id used to describe the ultimate capacity of the FPSO. It is showed that the Beta distribution is a better tool to model the short-term variation in peak SWBM especially when continuously changing loading conditions are present. It is argued that annual failure probabilities are a better measure for the reliability than the cumulative probability with respect to consequences such as fatalities . there is a larger effect in the updating when the structure has spent 15 years than it has been 10 years in exposure . the results showed that the most important parameter in the reliability analysis is model uncertainty in prediction of ultimate hull capacity. It is concluded that the model uncertainty should be considered in a more proper manner, in the sense that mean bias of hull girder capacity may play an important role in reliability analysis.

## کلمات کلیدی:

Time - variant reliability , hull girder ultimate capacity , corrosion, FPSO

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