

Time Dependent Reliability of FPSO Hull Structures

PAFA Consulting Engineers have recently produced a study for the UK Health and Safety Executive examining the time dependent reliability of FPSO hull structures. The study has attempted to determine the causes of the observed variation in the reliability indices calculated for tankers and FPS(O) vessels in studies published over the last 30 years. As part of this study, the methodologies of the example studies have been reviewed. particular attention was paid to the methods used for the calculation of the still water and wave induced bending moments and the vessel structural capacity.

The study applied a range of these methodologies to two example vessels. The results of these calculations suggested that the various methodologies of the past studies produced considerable variation in the calculated loads and structural

strength. Using the load and strength distributions in a standardised limit state equation resulted in reliability indices with a range greater than for the majority of the past studies.

It was concluded that much of the observed variation in the reliability indices in the reviewed studies arose from the differences in methods used to determine the loads acting on the vessels and structural capacities of the hulls considered. PAFA Consulting Engineers believe that further research is required to establish standardised methodologies for the reliability analysis of FPS(O) vessels. By eliminating the differences in methodology that have occurred in past studies, it is anticipated that more meaningful comparison of different vessels will be able to be carried out.

Summary

- Study commissioned by UK Health & Safety Executive to examine time dependent reliability of FPSO hull structures.
- Past studies indicate a reduction in reliability over last 30 years.
- Much of this variation is due differences in the methods used to determine loads and strength capacity.
- Standardised calculation methods are required for meaningful comparison of vessels.

Clients

- United Kingdom Health and Safety Executive

For More Information, Please Contact:

Edward Ballard
ejballard@pafa.co.uk

PAFA Consulting Engineers
Hofer House
185 Uxbridge Road
Hampton, TW12 1BN
United Kingdom

