

Chris Harper, Principal Engineer
Beta Machinery Analysis
300, 1615 10 Avenue SW,
Calgary, AB T3C 0J7
Canada
Phone: 1+403-245-5666
Email: charper@betamachinery.com

Title: Dynamic Analysis of Reciprocating Compressors on FPSO Topside Modules

There is a growing number of reciprocating compressors used on Floating Production Storage and Offloading vessels (FPSO) for many applications. These compressors are a significant source of vibratory force and can cause high vibrations of the compressors and FPSO module. These high vibrations can result in costly and premature machine failures as well as safety concerns to operators in work areas. To mitigate these issues, owners and engineering companies often require a dynamic analysis of the production structure when high horsepower reciprocating compressors are employed.

This paper discusses a large FPSO project where 3 compressor packages were mounted to the topside module. The example includes new analysis techniques to calculate the amplitude and location of high vibrations on the module deck and to optimize the topside module design. The example also reviews an integrated design approach, combining the topside module structural model with the mechanical model of the compressor packages. A summary of the design changes is also discussed as are recommended specifications for performing dynamic analysis studies.

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by Jackie Walters
jwalters@betamachinery.com
www.BetaMachinery.com