



# STRESS ENGINEERING SERVICES, INC.

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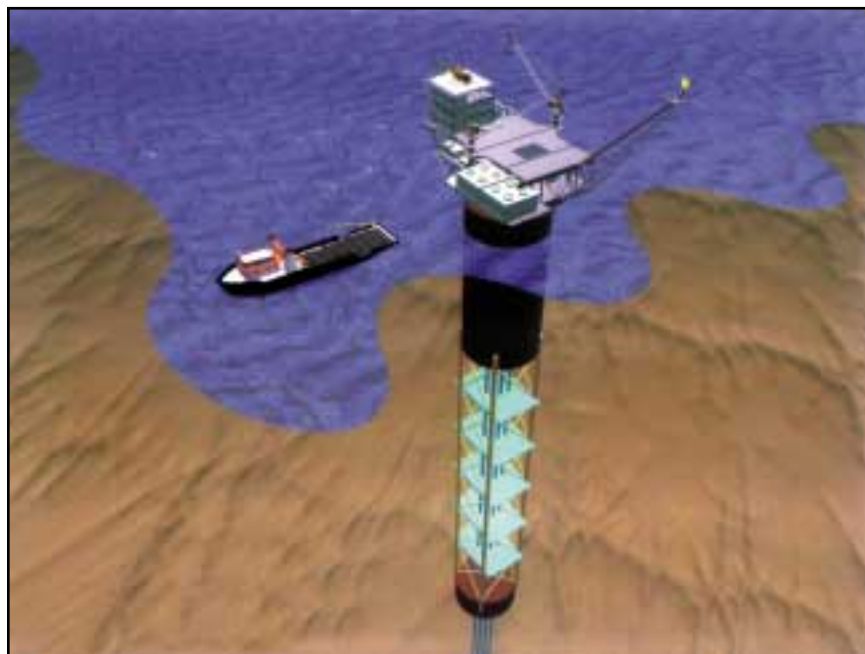
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## Deep Water Risers...Experience and Technology Are the Keys

### SES Has the Experience

SES has been continuously involved in riser analysis for more than two decades. This experience includes drilling and completion risers, as well as production and export systems for TLP's and Spars. Current work includes riser systems for both Floating Production Systems (FPS) and Offloading Production Systems (FPSO). As oil and gas production moves rapidly into deeper water, we are involved in the design and analysis of both top tensioned and steel catenary riser (SCR) systems.

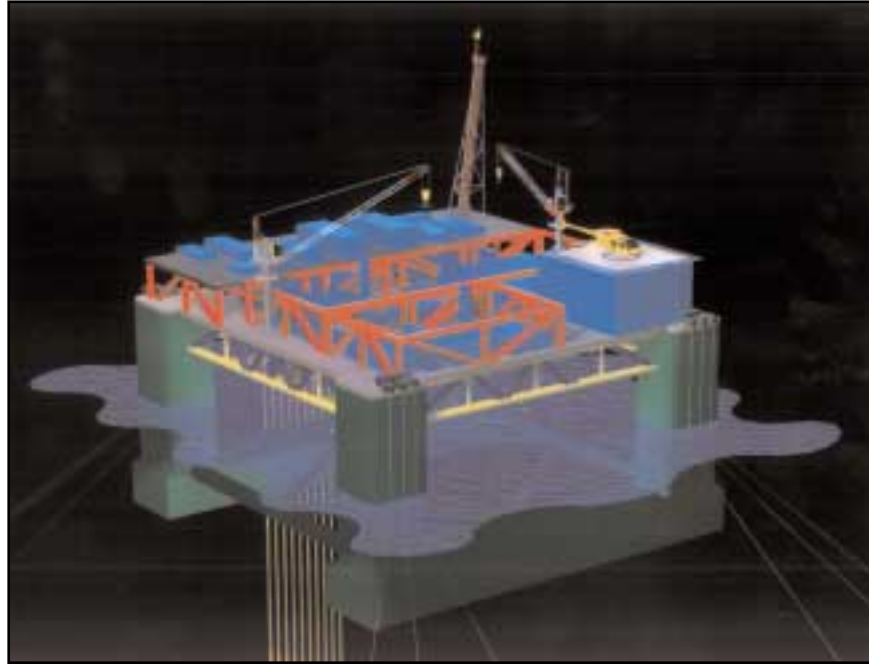
With over 100 man/years of experience in riser design and analysis, SES engineers have been involved with numerous deep water floating and subsea projects. This includes global riser response, initial sizing of components, defining component design loads and detailed design analysis and testing of components.



Gulf of Mexico Spar (Courtesy of Aker Marine)

## SES Has the Technology

SES addresses the complex mechanical problems associated with riser design and analysis with the latest computer-based analytical tools. These include DERP, TUBANL, Shear 7, ABAQUS and TIARA. TIARA incorporates dynamic riser analyses, VIV analyses, riser interference analyses and concentric tube analyses into one package, and is particularly useful in work on SCR's.



Conceptual design of Floating Production System  
(Courtesy of Aker Marine)

## SES Has the Testing Capabilities

SES offers full scale testing of riser components, including static testing for strength evaluation and dynamic testing for fatigue. Static testing can incorporate combinations of tension, bending and pressure. SES can perform tension only tests up to 10,000 kips. Cyclic testing capabilities include 4,000 kips tension at 1.33 seconds per cycle, rotary fatigue up to 80,000 ft.-lbs., and bending at 250 RPM.

**Stress Engineering Services has the riser  
experience you've been looking for.  
Call our Houston office today at 281-955-2900.**

**...Or visit our web site at <http://stress.com>**

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