



# STRESS ENGINEERING SERVICES, INC.

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## SES Expands Mooring Capabilities

**Design, testing, reliability and failure analysis for floating production mooring systems and risers are now available from a single source.**

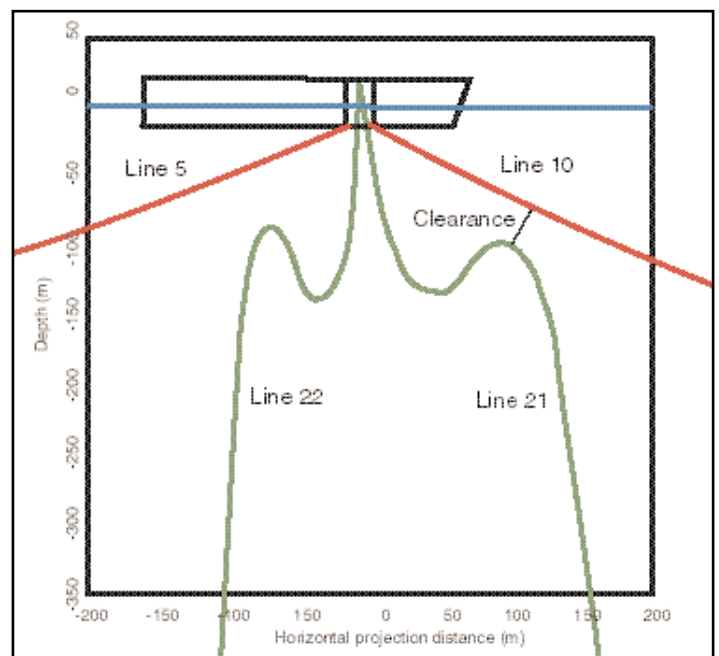
The catastrophic consequences of a mooring failure places an awesome level of responsibility on floating production system engineers. For this reason, experience is essential when it comes to designing and analyzing a mooring system and testing its critical components. Experience is the key factor for bridging the gap between what engineers want to accomplish and the design, analysis and testing work that needs to be done for a system to meet performance expectations. Experience reaches to the heart of what our expanded mooring capabilities are all about.

### **A Multi-Disciplinary Team at Technology's Leading Edge**

Stress Engineering Services offers clients a multi-disciplinary team with broad experience in floating production systems. Using the latest software for simulating environmental loads on the vessel, the vessel's resulting motions, and the responses of the mooring system, we can accurately and efficiently translate station-keeping requirements into mooring designs.



FPSO Zafiro Producer  
with 12 point conventional spread mooring



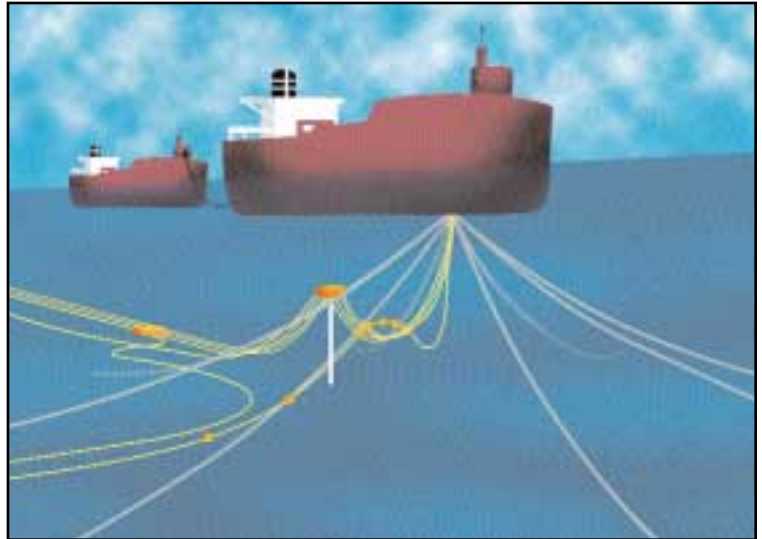
Computer simulation of a turret FPSO mooring lines and risers.

SES has also developed a new analytical capability called RAMS (Rational Approach to analysis of Marine Systems) for performing coupled vessel motion, mooring and riser analyses in both the time and frequency domain. RAMS gives SES a unique design capability for ultra deepwater moorings where the mooring lines and risers will impact the motion response of the floater.

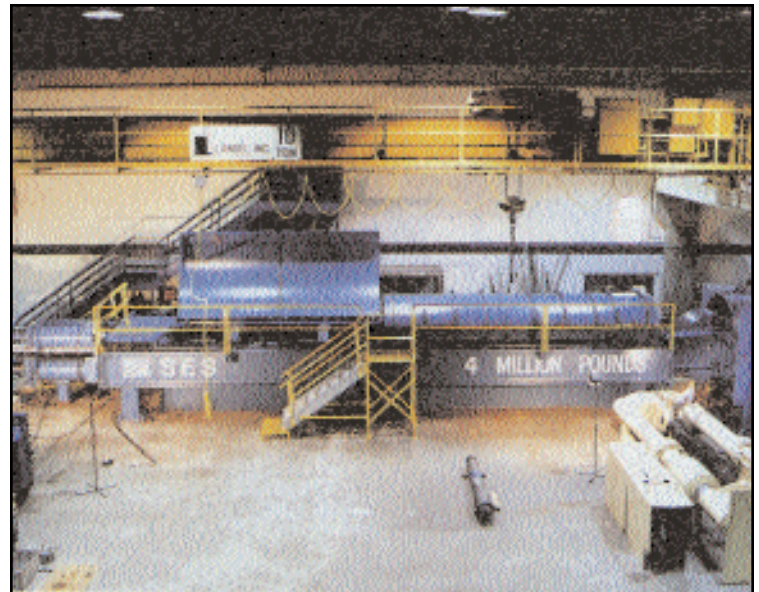
## SES Offers Experience & Expertise

SES has been involved with drilling, production and export riser systems for over 25 years. We have significant experience in dealing with synthetic mooring ropes including polyester ropes, and our materials group has conducted failure analyses of both wire and synthetic mooring ropes. Along with experience in performing mooring system reliability analysis, SES can also serve as a third party reviewer to satisfy the requirements of regulating bodies.

By combining RAMS with our recognized expertise in riser design and analysis, reliability analysis, load testing and material science, SES is now positioned to provide floating production system engineers with a full range of services. For clients, our ability to design both mooring and riser systems translates directly into schedule and cost advantages.



FPSO with turret mooring, flexible pipe production risers and steel catenary export risers.



SES operates two frames suitable for cyclic load testing of ropes (maximum load of 4,000 kips). Connecting hardware can be loaded up to 6,000 kips.

**For more information on our  
floating production mooring system and riser capabilities  
call SES today at 281-955-2900.**

**Email SES at [tml@hou.stress.com](mailto:tml@hou.stress.com)**

**...Or visit our website at <http://www.stress.com>**