

# Gulf Offshore Oil Platforms on Safe Foundations



**O**ffshore oil platforms are typically supported by very deep steel pipe piles. These piles must be carefully installed, and should be tested to verify that they can support the load for which they were designed.

**GRL Engineers, Inc.**, a provider of foundation quality assurance services, successfully tested the foundations of almost 20 new offshore oil platforms in the Persian Gulf between 2004 and 2005. Most of the piles GRL recently tested approximately 62 of them in the waters off Qatar and Saudi Arabia - were 1 to 1.7 meters in diameter and were driven with a hydraulic hammer. GRL monitored their installation and ensured that the hammer energy was sufficient to drive the piles as efficiently as possible but without incurring stresses that would damage them.

The monitoring involved installing accelerometers and strain transducers on the piles and analyzing the data collected by these sensors with a Pile Driving Analyzer®. The data collected also allowed GRL to evaluate pile capacity at the end of driving. For a sample of the piles the ultimate capacity was verified by delivering a few more hammer blows to an already driven pile after a waiting period of about 24 hours, collecting data from those blows and analyzing the data with a sophisticated capacity prediction software called Capwap®.

GRL Engineers, Inc. is headquartered in Cleveland, OH, USA, and has been providing foundation testing services both offshore and on land projects for more than 30 years. The equipment utilized in these tests is manufactured and distributed by USA based **Pile Dynamics**. Pile Dynamics equipment is sold throughout the world. ■

أتمت شركة GRL Engineers, Inc. فحص الأساسات الخاصة بعشرين منصة بترول في الخليج بين عامي ٢٠٠٤ و ٢٠٠٥. وقد استخدمت الشرق محلل شركة Pile Dynamics لقراءة المعطيات التي جمعتها أجهزة الإشعار.