

# Built for purpose rigs translate into efficient drilling

## ONSHORE MOBILE PLATFORM

**MANY EXPLORATION AND** field development portfolios include prospects in remote and environmentally sensitive areas. The need to access such areas with minimal environmental impact and to be able to carry on operations outside of the "limited timetable" allowed for conventional exploration and production operations led to the development of a new Modular Platform (patent pending), sometimes referred to as the "Arctic Platform".

In response to these needs, the concept of a light weight, land, sea or air transportable, aluminum construction modular platform was developed.

A test was designed to prove the concept. This was accomplished in four months with the design, construction, and yard assembly of two 12 ½ ft by 50 ft modules.

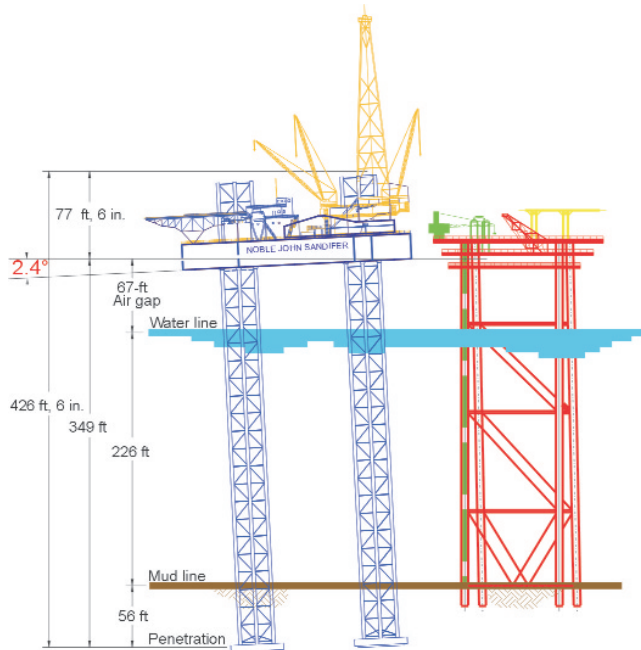
The authors will describe how the Arctic Platform was constructed, its mobilization from Houston and the field assembly and installation on the North Slope of Alaska within nine months of concept approval. Concurrent with the design and construction, actual platform legs were being tested for stability and load carrying capacity on a test site in Deadhorse, Alaska, with the participation of the University of Alaska.

With the onset of the spring breakup, the drilling and coring operations were suspended but the Arctic platform and the topsides were left in place while being monitored during the summer months. After re-commencements of operations in the fourth quarter 2003, and the completion of wellbore activities, the platform will be removed and the location remedied.

*Onshore Mobile Platform - A Modular Platform for Drilling and Production Operations in Remote and Environmentally Sensitive Areas* (IADC/SPE 87140) A G Kadaster, K K Millheim, Anadarko Petroleum Corporation.

## CLASS IV HURRICANE

On October 3, 2002, the Noble John Sandifer, a Levingston 111 cantilever conversion, was located approximately 60 nautical miles off the Louisiana coast in the Eugene Island area. Hurricane Lili, a Category IV storm, passed just west of the rig's location generating sustained winds of 128 mph and seas of 38 ft.



**A Category IV hurricane passed just west of the Noble John Sandifer resulting in only minor damage but providing the opportunity to compare analytical to actual results of storm conditions. IADC/SPE 87141**

While damage was minor, the event provided an opportunity to compare analytical to actual results.

The calculated wind speed value exceeded the rig's design value by 28%. As a result of the forces encountered, the forward and starboard legs settled. This resulted in a hull inclination of 2.8 degrees down by the bow and 0.8 degrees to starboard.

An engineering study of the storm's effect on the rig was performed and its calculated effects were determined. The study considered the storm's parameters and compared the analytical results to the detailed survey of damage. These comparisons focused on the spud can settlements, the areas of damage, and

the storm related stresses that were induced on the unit's structure. The study also examined the ability of a Levingston 111-C class jackup to withstand an extreme storm.

The authors will describe details of the shipyard repair, show the extent of the damage and the time frame in which the repairs were accomplished.

*Case Study of a 300 ft Water Depth Jackup in a Class IV Hurricane* (IADC/SPE 87141) H Duhaney, H Keys, P Daigle, Noble Drilling Services.

## TARZAN CLASS JACKUP

Over the past few years the rig construction industry has committed itself to building larger harsh environment drilling units as the wave of the future.

With the resurgence of deep gas drilling in the Gulf of Mexico, specifically on the shelf in 250 ft of water or less, the focus has turned to deeper wells in the 20,000-30,000 ft range.

The technology and equipment needed to drill wells at these depths, along with the higher temperatures and pressures, necessitates the need for a new jackup unit.

These criteria were the primary focus in our design of the Tarzan Class Jack-Ups.

The author will discuss the motivating factors in pursuing such a drilling environment; how it will be more cost effective to build a new drilling rig instead of modifying an existing unit; the technical design advancements of the rig and equipment that will enable it to perform with the highest efficiency; and how the customer will benefit from this increased efficiency and capability.

*Tarzan Class Jackup Units - A New Innovation for the Next Frontier in the Gulf of Mexico: Deep Drilling for Gas on the Shelf* (IADC/SPE 87142) J E Robertson, Rowan Companies, Inc. ■