



FUGRO JACK-UP MEASUREMENTS

The measurement and analysis of structural movements can reduce downtime, improve safety and extend the life span of a jack-up platform.

Jack-up platforms have traditionally been used in shallow water environments, but as costs and marginal field development have become significant, the use of a reusable structure has become increasingly attractive. As a result, jack-up platforms are now being used in deeper waters and harsher environments. Structural measurements can provide a significant benefit for this type of operation.

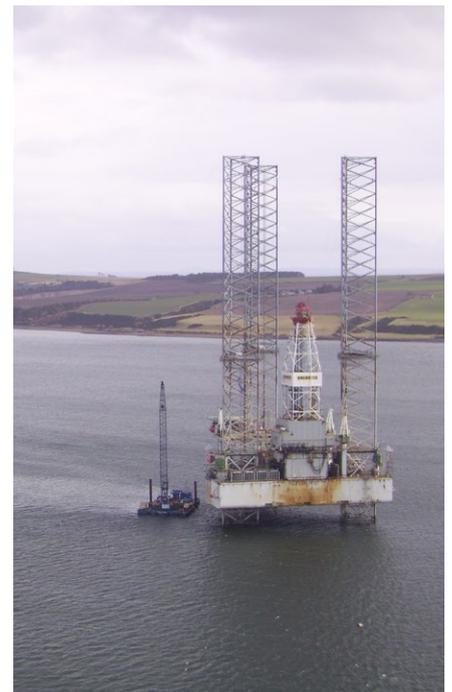
FUGRO SOLUTION

The instrumentation package for jack-ups is primarily used to aid operations such as jack-up moves and for monitoring relative motion when drilling. The same motion measurements are also used to validate

prior analysis of jack-up sway, helping to improve the model assumptions of critical soil parameters and understand fatigue. The inclusion of wave and wind sensors to the instrumentation package greatly enhances the value of the measurements.

BENEFITS

- Longer operating windows
- Extended life span
- Long-term asset value
- Enhanced safety



Measuring motions can aid decisions when moving jack-ups on location.



DECISION TO MOVE

The decision to move a jack-up on or off location can be complex and include safety, environmental and commercial implications. The decision to jack up or jack down is aided if the actual motions of the jack-up are understood. Fugro supplies autonomous monitoring systems for this purpose, which require no user intervention. Metocean conditions are also crucial to these decisions, and a wave radar can give information on significant wave height and wave period.

IMPROVING JACK-UP MODELS

Some of the highest risks of failure for jack-ups are related to soil conditions, which are often inaccurately estimated. By recording the motions of the jack-up and the sea state, the model can be refined to enable more accurate predictions of jack-up movement in severe weather conditions.

RELATIVE MOTION OF CONDUCTORS

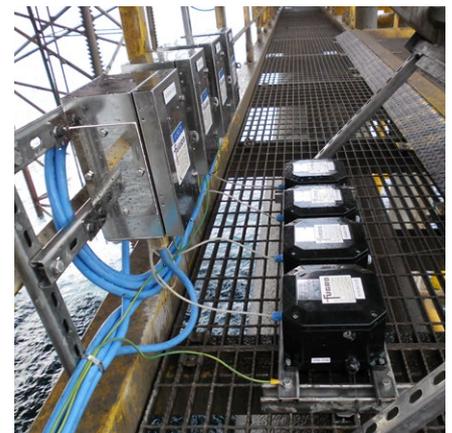
Cantilevered drilling configurations can have issues related to riser stress, due to the relative motion between the jack-up platform and the wellhead structure. A relative motion alarm system can be employed to continuously monitor the motion of the two structures, providing clear information for disconnect and reconnect decisions to be made with confidence. Downtime is therefore minimised without compromising safety.



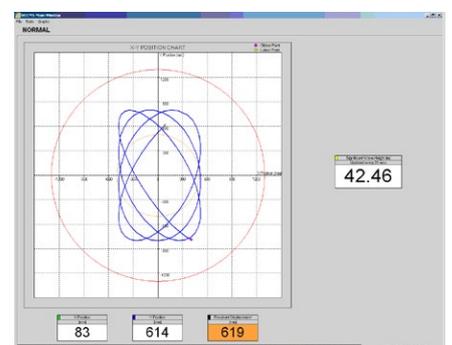
Improving safety with relative motion monitoring between a jack-up and wellhead platform

INSTRUMENTATION AND ANALYSIS

Instrumentation generally consists of a package of sensors such as accelerometers, draw wires or strain gauges connected to a data acquisition computer. The data are collected from the instruments and processed, but can also be displayed in real time, if required. Wave height, current and wind speed are often included to quantify the environmental loadings on the structure. Reports can be prepared and the data can be stored and presented on an onshore Fugro web portal.



Installation of motion sensors on a jack-up.



Plot showing relative motion between structures.