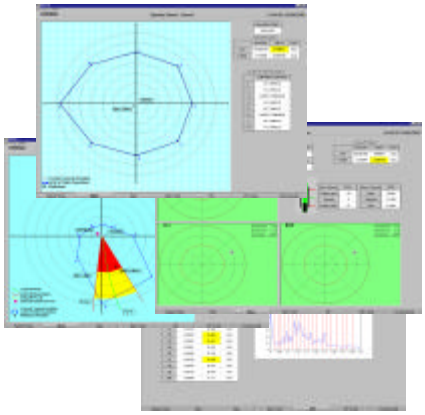
IRIS 3-D

Deepwater Riser Monitoring Package With Analysis And Predictive Capability

Offshore oil exploration is moving into deeper water, with drilling and exploration activities in up to 3000 metres of water. In this environment, exploration is normally undertaken from a floating vessel which is dynamically positioned, with the connection to the sea bed made using a riser of perhaps 26 of 30 inches diameter.

This drilling riser is clearly a highly critical component. While a 26 inch pipe three kilometres long is very flexible, the implications of over stressing the riser are severe.



Historically in critical applications, instrumentation has been used to monitor the condition of a structure. The vessel operator is then required to assimilate information from a range of sources, predict the outcome of a number of potential scenarios, and to make decisions on the operation of the vessel.

It can be seen that in the critical application described above, the vessel operator requires all possible assistance in obtaining accurate, relevant information, in as efficient a manner as possible. It can also be seen that there will be a huge advantage in having scenarios evaluated in a systematic manner.

IRIS-3D is a new instrumentation and software package designed to provide deep-water vessel operators with accurate information and a powerful and intuitive predictive capability.

A the heart of **IRIS-3D** is a powerful on-line riser analysis simulator based on the well-established 3D frequency domain program **Freecom-3D**, and time domain program **Flexcom-3D**, which were developed by MCS International and which are industry standard tools for riser analysis. The main simulator predicts and displays an Envelope of Safe Operation for the vessel. Additional simulators ensure riser integrity in hang-off and drift-off scenarios. In addition, a riser database manager is included to track and quantify the usage of riser joints.

IRIS-3D takes structural monitoring into a new dimension by presenting complex information to the vessel operator in a consistent format in a single package, and by automatically calculating allowable vessel limits and event scenarios using proven, powerful analysis tools on line.

The **Key features** of **IRIS-3D** are:

An Integration Tool for collation, interpretation & consistent presentation of measured data.

On-line Riser Analysis for calculation and display of limits of safe operation.

IRIS-3D Sensor Inputs consist of the sensors typically found in the modern generation of deepwater vessels:

- Riser top and bottom angles
- Riser tension
- Riser Stroke
- Vessel Position (from GPS or transponders)

Any additional sensors which may be available or specifically installed will enhance the riser modelling:

- Current (ADCP)
- VIV
- Static angle at mid riser

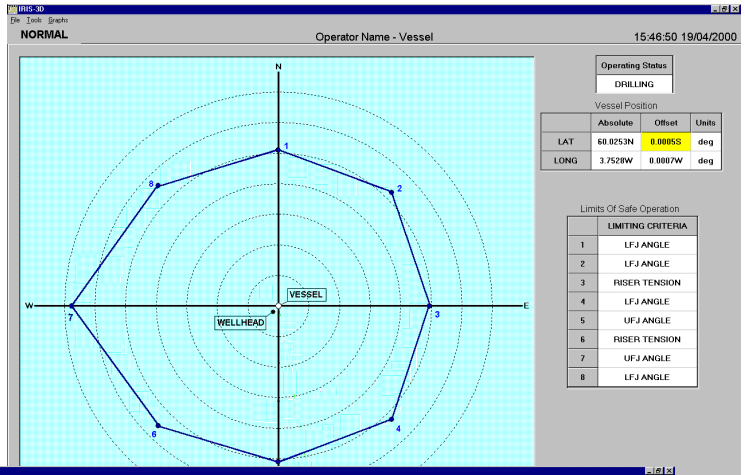
Benefits of **IRIS-3D**

- Maximised operating window
- Increased safety with enhanced riser integrity
- Reduction in fatigue and wear on critical elements

Main Display

Wellhead and Vessel Position

Limits of Safe Operation



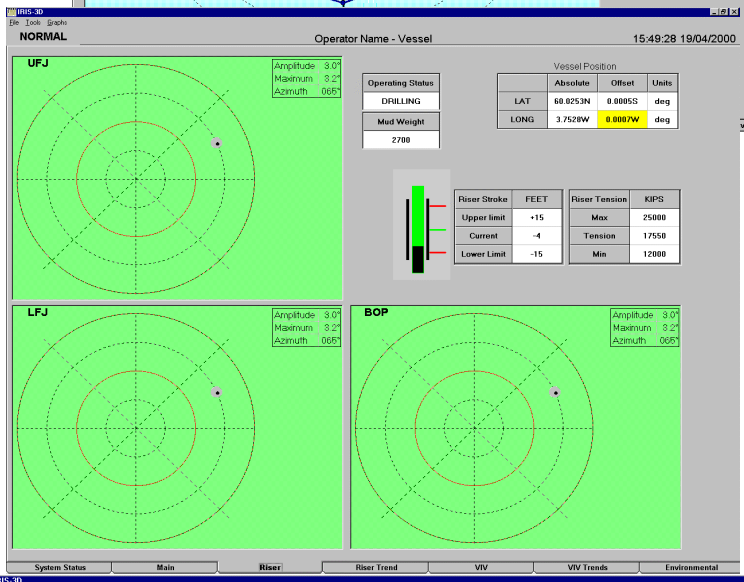
Riser Window

UFJ/LFJ angles,

stroke,

tensions,

vessel position



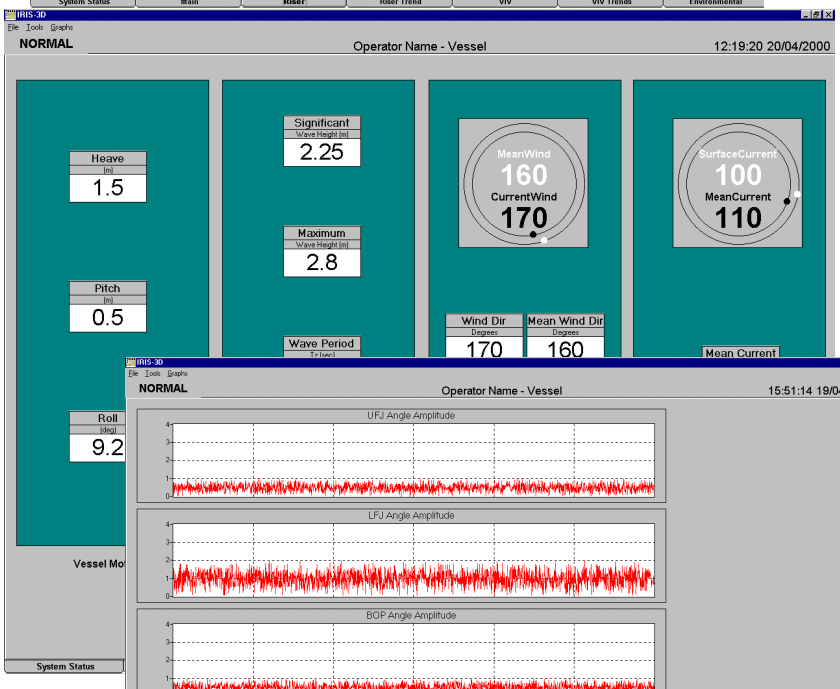
Environment Window

Waves

wind

current

vessel motion



Trend Windows

Trends over user selectable periods (All parameters)

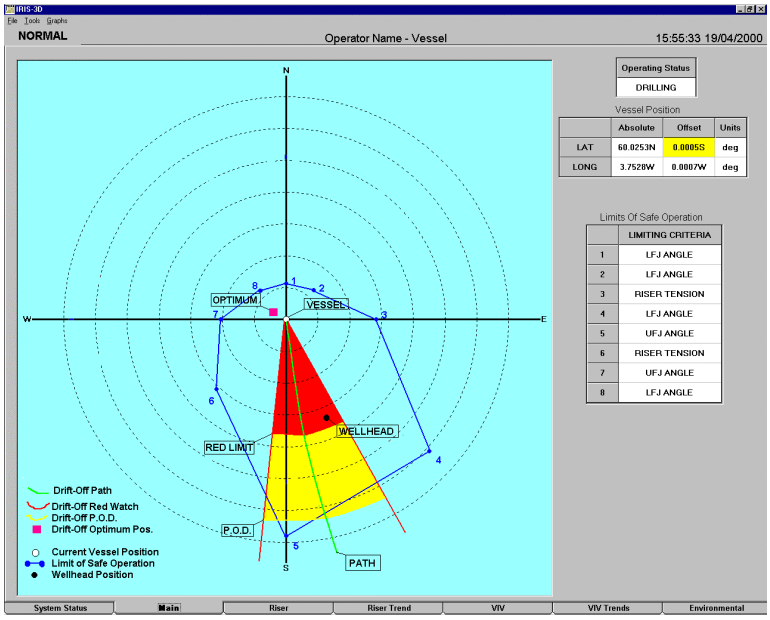
e.g. 8hrs, 24hrs etc.

•Riser Drift-Off Simulator

Uses expected drift off curve (specified or predicted) to determine riser behaviour in the event of drift-off.

Generates red watch and POD circles for EDS in drift off simulation.

Uses Flexcom-3D time domain analysis software from MCS



IRIS-3D is offered through the combined experience of Fugro Structural Monitoring in offshore instrumentation and data collection, and MCS International in riser analysis.

MCS INTERNATIONAL

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