

## Corporate Report

a report by

**Subsea Solutions**

Subsea Solutions was founded in 1990 and since has been providing subsea engineering support services to operators and drilling contractors, both domestically and internationally, in the upstream and downstream markets. Whether the drilling is 3,000ft off the coast of Africa or 7,500ft in the Gulf of Mexico, Subsea Solutions can provide peace of mind that the rig equipment is ready for the challenge.

Subsea Solutions' experts will survey the drilling and well control equipment before operations commence to assure there are minimal problems. The result is reduced downtime and operational cost savings. In addition to well control equipment surveys, the company also offer full rig inspections and their main services include:

- auditing/rig acceptance/between well inspection and testing;
- blowout preventer (BOP) equipment overhauls/upgrades/troubleshooting and repair;
- rig commissioning and total rig audits;
- conventional and multiplexing (MUX) BOP control systems/troubleshooting/modifications/upgrades;
- subsea trees;
- project management;
- representation at manufacturers facilities/construction/repair/testing/commissioning/supervision and quality control (QC);
- preventative maintenance; and
- hands-on assistance.

Subsea Solutions has been involved in new construction, auditing, deepwater upgrades and inspection and testing of both BOP and drilling equipment on mobile offshore drilling units (MODUs) and land rigs worldwide.

### Industry Standards

The company's personnel provide hands-on subsea, technical and rig inspection experience in accordance with industry standards, including:

- American Petroleum Institute (API);
- Minerals Management Service (MMS) Code of

- Federal Regulations;
- International Association of Drilling Contractors (IADC) Deepwater Guidelines;
- Norwegian Petroleum Directorate (NPD) Acts, Regulations and Provisions;
- UK Guidance Notes;
- American National Standards Institute (ANSI);
- Australian Petroleum Submerged Lands Act (PSLA);
- Australian Petroleum Land Act;
- Canada Nova Scotia Offshore Petroleum Board (CNOSPB) Regulations;
- Health and Safety Executive (HSE);
- International Maritime Organization (IMO) Code;
- Instrument Society of America (ISA);
- Safety on Land and Sea (SOLAS);
- US Coast Guard (USCG); and
- Manufacturers Technical Data.

With the continuing deepwater upgrade boom, personnel with experience in subsea shipyard upgrades and project management are at a premium and, subsequently, there is a lack of depth to many projects.

Subsea Solutions can provide the necessary experience. With new-builds, upgrades, stack rebuilds, hydraulic and MUX systems under their belt, assistance in planning and overseeing rig subsea refit projects and upgrades are the company's speciality. It is able to offer client support for the development of commissioning and acceptance procedures following rig upgrades and refurbishment activities. The company's specialist engineers (mechanical, electrical, instrumentation, marine and planning) assist clients to prepare and implement procedures, to ensure that the rig will comply with operator requirements, with an acceptable level of reliability, and will operate to conform to all necessary certification and statutory requirements.

Following the development of such procedures, Subsea Solutions can further support its clients by providing assistance with acceptance, the implementation of commissioning procedures, and to ensure the work is carried out in a timely manner. It will also provide a support service for integrating the

skills of construction yard personnel, vendor representatives and certification authorities.

Subsea Solutions specialists are able to develop and implement planned inspection and maintenance programmes for both onshore and offshore rigs. It has been demonstrated that the cost of this service is paid for by the increased reliability of the rigs that have implemented such a planned system. There are additional benefits that arise from improved safety levels for personnel to better environmental protection.

In the current economic climate, it is important that up-to-date rig and equipment valuations are available to assist in financial planning and to ensure insurance costs accurately reflect current values. Subsea Solutions can provide a valuation service for existing rigs and an assessment of upgrade improvements with associated costs. To complement this service it can help clients by providing and implementing a cost-control and scheduling programme. This will survey automatic fault extraction (AFE) values, monitor expenditure, predict trends and demonstrate to clients the financial efficiency of a particular project.

Key issues on any project at present are safety of personnel, protection of environment and the security of asset investment. In-depth expertise within Subsea's organisation enables them to undertake risk assessments, prepare safety cases, conduct hazard and operability tests (HAZOPs) and review both project plans and operational procedures from a safety viewpoint.

### Well Control Equipment

Subsea Solutions personnel are trained to provide a full QC service for annulars, ball and flex joints, ram BOPs, choke and kill systems, control systems/drilling and production, connector, diverter systems, motion compensation equipment, riser systems, wellhead and christmas tree equipment and valves.

Subsea Solutions' Well Control Equipment Inspection and Testing audit process is conducted using criteria derived from operational demands, classification societies, regulatory compliance requirements, standard practices, manufacturers' technical documents, bulletins, and operation and maintenance (O&M) manuals. Subsea Solutions surveys are conducted with the final goal of no downtime.

### Clients

Subsea Solutions has provided technical expertise to many high-profile drilling prospects including: Boreas,

### Sources Include:

API Specification 6A: Wellhead and Christmas Tree Equipment  
 API Specification 16A: Drill Through Equipment  
 API Specification 16C: Choke and Kill Systems  
 API Specification 16R: Marine Riser Couplings  
 API RP-16E: Design of Control Systems for Well Control Drilling Equipment  
 API RP-16Q: Design, Selection, Operation and Maintenance of Riser Systems  
 API RP-53: Blowout Prevention Equipment Systems for Drilling Wells  
 API RP-64: Diverter Systems Equipment and Operations  
 API 510: Pressure Vessel Inspection Code/ Maintenance, Inspection, Rating, Repair  
 API Specification 576: Inspection of Pressure Relieving Devices  
 ANSI: American National Standards Institute  
 Australian Petroleum Submerged Lands Act  
 Australian Petroleum Land Act  
 Canada Nova Scotia Offshore Petroleum Board (CNOSPB) Regulations  
 MMS Code of Federal Regulations/Title 30/ Subchapter B – Offshore/Chapter 11  
 IADC Deepwater Well Control Guidelines  
 Manufacturers Technical Documents  
 Manufacturers Bulletins and O&M Manuals  
 NACE MR0175: Sulfide Stress Cracking Resistant Metallic Materials  
 Norwegian Petroleum Directorate Guidelines

Coulomb, Cheyenne, Diana, Four-O-Six, Front Runner, Glider, Hadrian, Goose, Great White, Hawkes, Kia, Kizomba, Lloyd Ridge, Mad Dog, Marshall/Madison, Medusa, Mica, Princess, 17-Hands South, Shiner, Yorktown and Zia.

### Subsea Solutions' Service

The company provides an honest evaluation of the equipment and whether it is fit for purpose. Subsea's inspectors apply the 'fine-toothed comb' approach and incorporate proven techniques developed through years of experience.

With an emphasis on quality and technical excellence, Subsea Solutions personnel are the 'eyes and ears' for the operator during rig acceptance and equipment inspections. While working as a team, the company maintain a good working relationship with both the operator and drilling contractor.

The field service technicians are on call 24 hours a day, seven days a week to handle all on-site service needs. These individuals are highly skilled in providing installation assistance, making field repairs and performing routine, scheduled maintenance on the equipment. They also provide the following technical support, along with the services.

- Installation – the personnel are present during equipment installation and provide training for the operations staff as specified.
- Field Repair – the technicians perform trouble-shooting diagnostics and make repairs on-site, without removing the equipment from service.
- Maintenance – preventative maintenance services help to minimise wear and damage and to extend the life of the equipment.
- Technical support – experts in quality assurance, QC, product engineering, field installation and preventable maintenance procedures can be provided on a project or contract basis.

#### **Subsea Solutions – Mission Statement**

To set the industry standard for third-party well control equipment services.

Subsea Solutions personnel each have a minimum of 20 of years hands-on and technical inspection experience, and have been involved in construction and commissioning of many of the rigs currently operating worldwide. ■

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