deepview 3d™

Industry Challenges
Following catastrophic failures in the North Sea and Gulf of Mexico, operators, industry organizations, and regulators have strived to make the drilling and offshore industry safer. Some of the challenges the industry faces include:

- Ageing equipment that requires accurate condition assessments
- Detailed inspection and maintenance data needed to meet industry regulations
- Subsea maintenance as a critical path for well operations
- Increasing regulatory requirements
- Equipment complexity that has grown exponentially
- Time and cost of meeting original equipment manufacturer (OEM) requirements

What is DeepView®?
DeepView® is a new inspection methodology that combines 3D laser scanning and precise metrology data with advanced non-destructive testing (NDT) results that are then joined in a 3D space to give an accurate representation of current equipment condition and mechanical integrity of critical assets.

Using innovative and cutting-edge technologies, Intertek sets a new standard for digital mechanical integrity data and condition assessment of your critical drilling and offshore operational assets.

In the complex world of offshore oil and gas production, operators are continually striving to ensure economic production levels, reliability and safety, as well as drive down operating costs. Intertek’s professionals can help you meet these challenges with in-depth expertise involving offshore operations, safety management, knowledge of offshore governmental regulations, environmental considerations, and a comprehensive level of engineering skills.
The DeepView\textsuperscript{3D} Process

Critical assets are identified using risk assessment methodologies. For drilling operations, this could include Blow Out Preventers (BOPs), drawworks, top drive, crown block and other key operational equipment items or sub components. Once critical assets have been identified they are scanned in-situ or on deck using a 3D scanner to provide a digital image of the equipment and its environment. The equipment is then scanned using 3D metrology that provides precise digital measurements of the component apertures, surfaces, contours and perturbances. Key areas for inspection could include the:

- Cavity and wellbore of the ram BOP for damage; key seating and excessive wear
- Seal seat and wear plate for damage, wear and scratches
- Surface of the piston rod for pits, dings, or gouges
- Seal ring carrier assemblies
- Bonnet to body and body to bonnet faces

This data can then be compared with baseline digital data, drawings and design tolerances to deliver a quick and complete comparison to evaluate the effects of wear, corrosion or mechanical damage. Based on this data, a decision can be made as to the on-going mechanical integrity of the component.

In conjunction with the 3D metrology digital dimensional data, the equipment item and its sub components, such as bolts, pins and critical surfaces, are scanned using specialized phased array ultrasonic testing (UT) technology in order to identify any defects or operational damage within the equipment. For risers, BOP bores and choke and kill lines, Intertek and Laserstream utilize the Bemis laser scanner and the Riser Active Data Acquisition Recorder (RADAR) which are robotic inspection tools that internally scan the walls and welds of risers for flaws and transmit the data in real time for analysis. Defects that are found can be measured and compared or calculated against critical flaw diagrams to determine the on-going integrity of the equipment item.

Finally all this data is combined into a digital report that shows 3D images of the equipment with precise 3D dimensional data (0.004 mm) and identified areas of phased array scan data. This report can then be used to confirm integrity of equipment item for Certificate of Conformance (CoC) as well as provide baseline data for future integrity comparisons as the equipment ages.

Our clients view the DeepView\textsuperscript{3D} solution as part of a CBM (Condition Based Maintenance) program where, over time, they can move away from time-based maintenance and transition to a condition based maintenance program.

**Key Benefits**

The DeepView\textsuperscript{3D} process provides a range of benefits for OEMs, drilling contractors and operators alike. Some of these benefits include:

- In-situ and on deck condition and integrity assessments of critical equipment items
- A consistent methodology for inspection and dimensional control of equipment items
- A baseline of digital data related to the dimensions and integrity of equipment that can then be compared with future assessments
- Time and cost savings related to on-shore tear down and condition assessments
- Reverse engineered records for components that no longer have engineering drawings
- Additional engineering evaluations such as stress assessments, design reviews, wear and damage assessments, reliability evaluations and future material/equipment recommendations
- Enhanced equipment safety and reliability
- Adherence to regulatory requirements
- Opportunity for OEMs to work with latest technology thus saving clients’ time
- Auditable equipment condition digital records
- Condition tracking over time resulting in condition comparisons
- Support for fitness-for-service and remaining useful life decisions

**Complementary & Additional Services**

Due to the combination of structural complexity, specialized equipment and environmental challenges, safety and asset integrity management are of the greatest importance to offshore oil and gas production systems. Intertek is well positioned to provide this support. As an internationally recognized Total Quality Assurance company specializing in petroleum production equipment performance optimization, asset integrity, and condition assessments, our engineers and operation specialists provide a range of services.

In conjunction with the DeepView\textsuperscript{3D} service solution, Intertek also offers the following:

- Mechanical integrity evaluations of all drill equipment
- Design reviews
- Corrosion and materials evaluations
- Wear and damage assessments
- Stress analysis
- Risk and reliability assessments
- Integrity Data Management Software tools (AWARE)
- Big data analysis
- Regulatory support
- Well control training