# **Hull Management Software Improves Aim**

■ New software can manage, optimize and extend the working life of offshore assets.

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Even small reductions in uptime can cause significant losses in revenue. Particularly in today's volatile market, in which oil prices are about half of what they were last year at this time, operators and drilling contractors are feeling the effects of downtime, so preventing nonproductive time is critical.

Safety and quality are paramount concerns for the oil and gas industry, particularly in complex operations in deepwater and harsh environments. Operators and drilling contractors are constantly challenged to maximize asset efficiency and manage costs while protecting the safety of their people and the environment. The fact is, however, that achieving safety objectives is not possible without paying strict attention to asset integrity.

#### Managing downtime

According to a study by ARC Advisory Group, as much as 80% of losses attributed to unscheduled downtime are preventable. So the obvious question that arises is, "How is it possible to prevent unscheduled downtime?" A big piece of the puzzle is making sure maintenance is being done effectively, and that means determining what maintenance is truly necessary and scheduling the work so that the impact on production is as low as possible.

The trick to doing this effectively is to be able to determine the integrity of offshore assets conclusively enough



This 3-D structural model of a jackup illustrates the high level of detail that can be seen using the Nautical Systems software to visualize assets. (Images courtesy of ABS)



The Hull Manager 3D software allows an internal space walkthrough so the user can visualize the condition of an individual compartment.

to know when maintenance is needed. That requires a significant amount of accurate data. Recognizing this need, ABS has developed a set of software tools that provides both a risk- and condition-based approach to reducing downtime and extending the service life of offshore assets. Available through the ABS Nautical Systems Fleet Management Solutions, Hull Manager and Hull Manager 3D offer a scalable approach to managing the condition of the hull structure at whatever level an operator chooses. Both provide asset-specific database tools that manage inspections, track condition, plan repairs and interface with structural analysis tools for anomaly treatment and life-extension planning.

#### Enabling a finer view

The Hull Manager software combines web-based data management tools with an optional 3-D model that makes it possible to see virtual condition details. This allows condition data and hull steel thickness measurements to be viewed, making it easier to visualize and evaluate the integrity of the hull. The software converts CAD model information into a relational database that captures the condition of structures in a virtual 3-D environment.

Data from the module can be linked to finite element (FE) software for more extensive structural analysis. The FE interface allows users to select structural elements to form a collection of parts and provide structural properties and condition of the structure. The collection can be previewed and parameters set for "idealization" (defeaturing) based on the desired analysis. Next, the required geometry is sent to the defeaturing and meshing tool. The structure

can be reassessed in its current gauged condition in the analysis suite of the operator's choice.

By providing a way to see imperfections more clearly and to better manage how problems are addressed, this software offers a way to pragmatically and systematically manage, optimize and extend the working life of offshore assets.

### Data drives decision-making

Data-integration, visualization and analytics allow owners and operators an easier and more intuitive way to track and trend the condition of the asset for its planned or extended life. This approach supports the complete life-cycle

management process using auditable reporting and tracking mechanisms for offshore stakeholders to demonstrate due diligence and compliance, with the ultimate goal of safeguarding life, property and the natural environment.

ABS Nautical Systems software is designed for flexibility so it can be used not only to manage the core aspects of hull integrity, such as inspection scheduling, planning and the managing of anomalies, but also to create and visualize completed hull gauging plans, plan and estimate repairs, and perform remaining life calculations, thus helping assets meet regulatory requirements.

Integrating structural information from initial surveys through late-life maturity enables real-time condition intelligence-gathering, making inspection and condition data immediately available so maintenance planning can be proactive and costly downtime can be minimized. The software allows all locations on the hull to be divided into inspection zones that are evaluated in terms of coating condition, general corrosion, pitting/grooving, deformation, fractures and cleanliness. Then each inspection criterion is defined and scored.

Having these data in hand allows problems to be identified in the early stages of discovery so they can be addressed before they become more severe and more costly, with greater potential for associated downtime. The end result is the ability to use these data to help make a working asset safe, with a firm understanding of the integrity, so its working life can be extended. Further, one can identify fleetwide trends, which serve the added benefit of keeping the hull integrity program evergreen.