

Condition-Based Maintenance Programs



341A1-FV250

UPPER GUIDEARM EXT. RETR.

341A1-FV250

GUIDEHEAD ADJUST

341A1-XV256

XV256

GUIDEHEAD PIPEPUSHER

341A1-XV253

341A1-JB
24VDC

Dette udstyr inneholder
egensikre kretser
This equipment contains
intrinsically safe circuitry



Contents

Equipment certification documentation	04
Initial condition assessment	05
Data analytics/Rigsentry	07
Dedicated technical and program support	08
Periodic maintenance scope	08
Third-party certification	09
Repair	10
Value statements	11

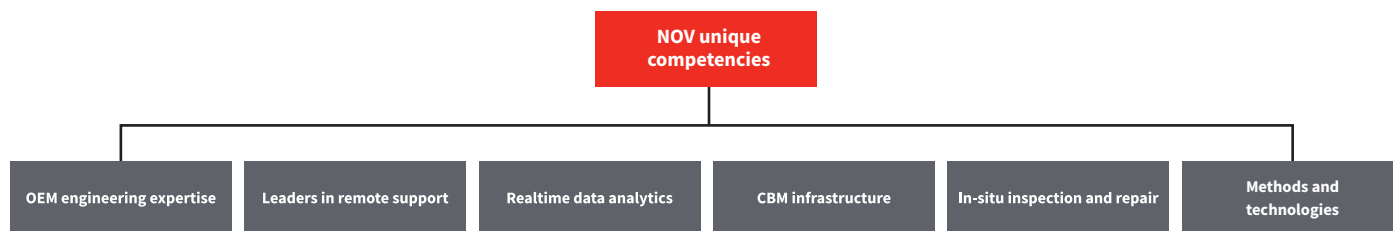


At NOV, “service” isn’t just something we offer—it’s a driving mentality behind how we conduct business. The desire to truly make a difference for our customers has been the foundation of how we approach our aftermarket services, treating you as a partner, not just a client. Our condition-based maintenance (CBM) programs follow the philosophy that we work best by bringing together our unique competencies—allowing us to optimize maintenance, maximize equipment availability, and reduce the total cost of ownership of NOV assets.

Equipment certification documentation

Our CBM programs offer a continuous certification of your NOV assets, which means you can keep operating while condition dictates, minimizing costly out of service time.

As part of the continuous certification program, we offer a Certificate of Service – Continuous. This certificate states that the equipment has been inspected, serviced, and certified per OEM recommendations as part of the CBM program, which ensures adherence to our rigorous quality management system. Components that require a major overhaul during the program will receive a Certificate of Conformance, and during periods when your rig is off contract, equipment will be preserved according to our standards and certification will be “frozen”.





What We Have To Offer

Initial condition assessment/baseline

The below components of our CBM program are part of an integrated package tailored specifically to your needs. As your partner, we want to help reduce your spend without sacrificing equipment integrity and performance.

Equipment is inducted into the continuous certification program by establishing a baseline, via a review of records and equipment condition. This service is performed as part of a prequalification for all equipment that will be part of the CBM program. The assessment will include a review of the following:

- Time since last full inspection
- Equipment usage
- Preservation measures
- Maintenance records
- NDE reports
- Test reports
- Repair and usage history
- Equipment design

Once the initial baseline data review and physical inspection is completed, we will supply a full baseline report on all equipment and systems in the CBM program and will issue the initial equipment certification document.



CLOSE



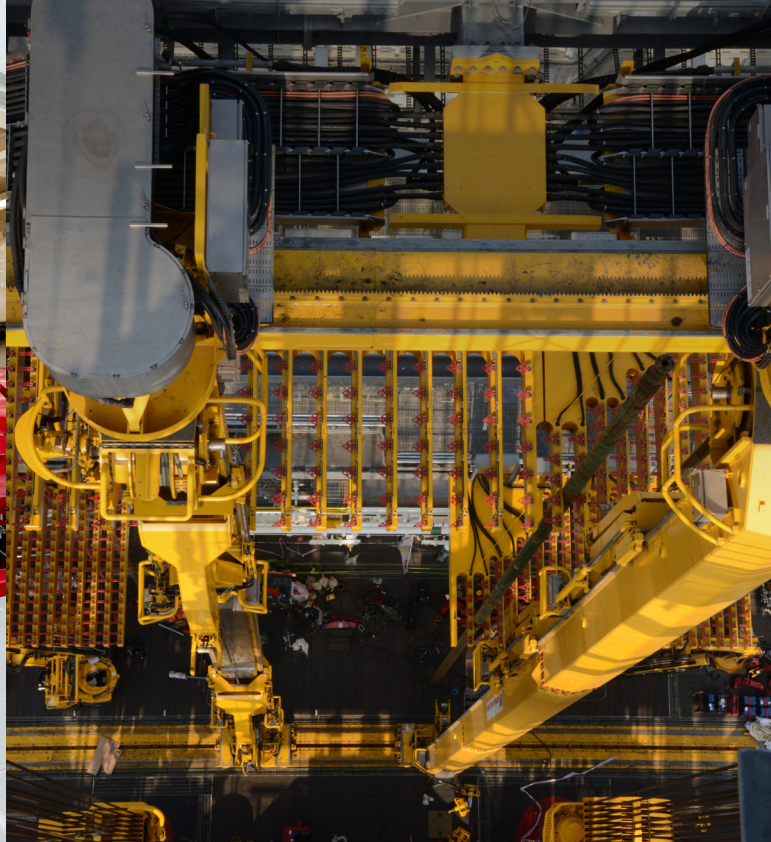
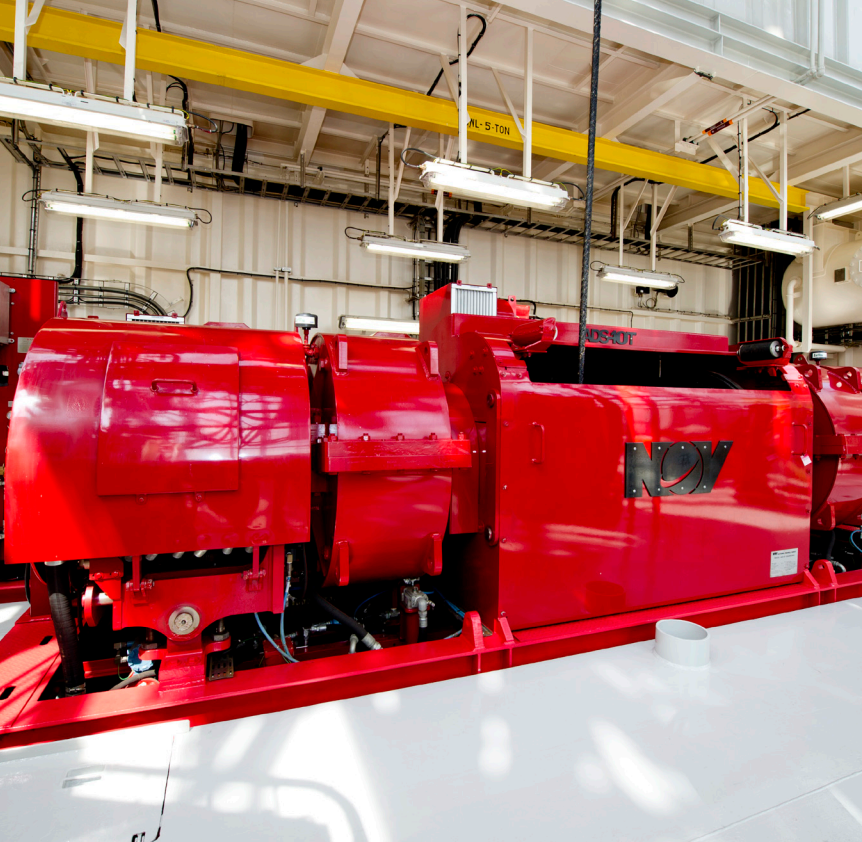
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Data analytics/Rigsentry

Our Rigsentry™ technology is the first and only OEM product to be certified by both ABS and DNV-GL for condition-monitoring services for drilling and subsea equipment. We provide all equipment and software installation necessary for meaningful analysis and application of the data findings to your operation, such as guidance on maintenance, procedure, inspection intervals, and continuous certification requirements.

Beyond native sensor data, we will install additional sensors for vibration detection and moisture and particle monitoring, aiming to prevent major cliff events through early detection. We will run usage-based, prognostic, and reliability centered analytics on equipment, aggregating rig fleet data and core domain product knowledge to help inform decision making. What this means for you: Our goals are to increase equipment availability, ease your effort to achieve/maintain class notation, and increase the marketability of the rig. Rigsentry will put you ahead of the pack.

CLOSE



Dedicated technical and program support

We provide dedicated logistical and technical support for review of equipment data and notifications, maintenance records, and inspection findings. In addition, we supply tailored inspection documentation, perform data analysis, and prescribe upcoming recommended maintenance tasks. We provide this support with multifunctional teams, including maintenance and reliability engineering, data science, product engineering, and aftermarket field service.

Periodic maintenance scope

As part of the program, we provide between-well maintenance guidance, highlighting work for you to perform based on data and inspection findings. Event-driven maintenance will be dictated and justified by equipment condition, reliability models, or real-time monitoring. We also assist your rig crew with periodic maintenance supervision and support.



Third-party certification

NOV is certified by both ABS and DNV-GL as an approved supplier of condition-monitoring services for drilling and subsea equipment. We will send experienced, certified personnel to the rig to collect the data, which will be analyzed by our team of certified vibration analysts.

NOV analysts:

- Are certified ISO Category II and Category III vibration analysts
- Create, execute, and continuously improve procedures controlling the entire process, from data collection to analysis to reporting
- Have knowledge of the equipment’s internal design, as well as access to drawings and parts lists, which is invaluable when defining the required data collection parameters and set-ups
- Ensure the collected data is valid and sufficient prior to leaving the rig
- Have full access to all NOV resources, including engineering teams
- Peer review reports prior to release

We also have an ongoing joint-development project with ABS on the development of a new digital certification, which resulted in new ABS class guidance released in December of 2018.



NOV is certified as an Approved Service Supplier for Condition Monitoring for classic CM methods.

“DNV-GL’s close cooperation with NOV and their focus on a digital transformation have been very useful during the development of our new approval program for suppliers offering CBM services to ship and rig owners.

The program, which is based on international standards, represents a common framework for a shared maintenance management between an OEM and the equipment owner, focusing on data management, condition monitoring, diagnostics, and prognostics.

DNV-GL looks forward to continuing this good cooperation and approves NOV and the RigSentry system according to the new program issued in January this year.

—Are Torstensen, Director of Technology and Service Development, DNV-GL Offshore Classification



As part of the development of ABS’ goal-based framework for smart functionality incorporation, ABS and NOV worked together to review and recognize the enabling technology developed for RigSentry and how it can support a deeper understanding of a machine’s health state. ABS anticipates that the data made available by RigSentry will further contribute to the ABS goal of having data provider support for a more condition-based and continuous execution of class surveys.”

—Matthew Tremblay, ABS Executive Vice President for Global Offshore



Repair

We are a global company with repair facilities all over the world. This minimizes your downtime and ensures drilling consistent activities.

This will be based on fleet spare exchanges and/or equipment condition to maximize efficiency. We work with you to determine the ideal location of the repair, which will be decided based on rig location, logistics, timing, and other related factors. Our goal is to make workshop repairs and planning as efficient as possible and minimize impact to your operation. Our goal is to make any repairs as simple as possible.



Value statement

Maersk Drilling

“Advanced maintenance and continuous support is a very important part of ensuring better and more cost efficient services to Maersk Drilling’s customers. Our partnership with NOV on condition based maintenance enables more databased decision-making. This approach holds great potential, and we are very pleased to work with NOV in this area.”

-Frederik Smidth, Chief Technical Officer, Maersk Drilling



MAERSK
DRILLING

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