OIL & GAS

NOBLE DENTON MARINE SERVICES

Jack-up and geotechnical engineering
SMART SOLUTIONS TO COMPLEX OFFSHORE CHALLENGES

From the drawing board to decommissioning, DNV GL supports customers in solving complex technical issues. Our work is enhanced by a broad service portfolio and a worldwide network of experts who are dedicated to helping achieve a safe and sustainable energy future.

Our Noble Denton marine services have been setting the standard in marine industry for over 50 years. Much of the sector follows our guidelines, standards and rules, and we have contributed significantly to developing global best practice in marine operations.

Mobile jack-up units present complex engineering challenges that require fast and reliable analysis. Working in partnership with oil companies, contractors, shipyards, consultants, designers and utility companies, DNV GL offers structural, geotechnical and mechanical analysis for marine and offshore projects in all phases of operation.

Supporting customers with fast, reliable and innovative solutions to complex engineering problems, our team of technical experts has extensive experience in working with jack-ups for drilling, accommodation, platform maintenance and wind farm installation.

DNV GL enables safety, reliability and performance at every stage of the asset lifecycle. From the inception of a project, we support customers in performing initial feasibility studies for tender qualification or rig screening, including review of foundation suitability and potential hazards during installation and operation, through to detailed site-specific assessments at the most challenging of locations for marine warranty approval.

SUPPORTED BY TAILOR-MADE SOFTWARE

DNV GL’s JUSTAS software enables the site-specific assessment of jack-up units in robust and consistent approach, helping users to evaluate individual jack-up performance in a time-efficient and cost-effective manner. Developed by leading experts in jack-up technology, our in-house software incorporates jack-up dynamics and non-linear soil-structure interactions modules in one suite together with a comprehensive range of analysis options and assessment criteria including the Society of Naval Architects and Marine Engineers (SNAME) T&RB 5-5A ‘Recommended practice for site assessment of mobile jack-up units’, DNV GL, ABS and ISO 19905-1.

The comprehensive analysis results provide not only loads and reactions at the seabed and leg to hull interface from the global assessment but also assessment checks (UC’s) for key parameters, including: overturning stability, windward leg sliding, preload requirements, leg and holding system strength, leg length and air gap. The versatility of JUSTAS software also enables easy optimization of jack-up performance, screening of suitable locations, and is used in the development of jack-up capability maps.
Our services in detail

DNV GL’s jack-up and geotechnical team offers an integrated engineering service to ensure safe installation and operation of jack-ups. The multi-disciplined and highly experienced team is capable of covering all aspects in assessing jack-up performance, taking into account its unique non-linear soil-structure-hydrodynamic interactions*. Our services include:

- Review, advice, and real-time support on geotechnical site investigations
- Leg Penetration Analysis including geotechnical hazards identifications
- Geotechnical stability assessments of offshore structures
- Jackup site-specific assessments according to SNAME 5-5A and ISO 19905-1 including compliance with Norwegian requirements
- Windfarm installation vessel assessment to Renewable UK guidelines
- Screenings of suitable units or locations and provision of capability maps for jack-ups
- Punch-through / Sudden Drop Unit Capability
- Rack Phase Difference (RPD) limit analysis
- Motion response and leg strength for towage
- Advanced jack-up structural analyses, e.g. leg touch-down, vessel impact, earthquake response, fatigue analysis, blast response, etc.

Our expertise also encompasses the provision of practical and cost-effective solutions for identification and mitigation of jack-up geotechnical hazards such as:

- Punch through: determining a safe preloading strategy suited for site-specific geotechnical challenges
- Spudcan-footprint interaction: determining a safe installation strategy e.g. by means of a carefully planned stomping sequence
- Leg extraction: providing safe limits and procedures for leg pulling attempts
- Spudcan scour: analysis and scour protection.

SUPPORTING SAFE AND EFFICIENT RIG MOVES
We support customers throughout the entire rig-moving process from pre-move rig checks and preparations, and tow safety and requirements, to positioning, installation and securing the elevated platform.

Our site-specific analyses enable companies to review and optimise load conditions in advance for suitability, including lightship, variable, centre of gravity, wind, wave and current, and conductor loads.

* please contact us at Jack-upGroup-London@dnvgl.com
Setting the standard

We have contributed significantly to developing guidelines, standards rules and global best practice in marine operations. But, with the oil and gas sector working on more complex projects in increasingly challenging environments, we believe that the benchmark can always be higher.

Every year, we invest 5% of our revenue back into research and development to keep us at the forefront of our customers’ challenges. That results in more robust standards and, when you combine those with the deep technical expertise we bring to the complete asset lifecycle, you get true risk reduction.

About DNV GL

DNV GL is the technical advisor to the oil and gas industry. From project initiation to decommissioning, we enhance safety, increase reliability and manage risks in projects and operations.

Our 4,000 oil and gas experts offer local access to global best practice in every hydrocarbon-producing country. Driven by a curiosity for technical progress, we provide a neutral ground for collaboration; creating competence, sharing knowledge and setting industry standards.

Our independent advice enables companies to make the right choices. Together with our customers, we drive the industry forward towards a safe and sustainable future.