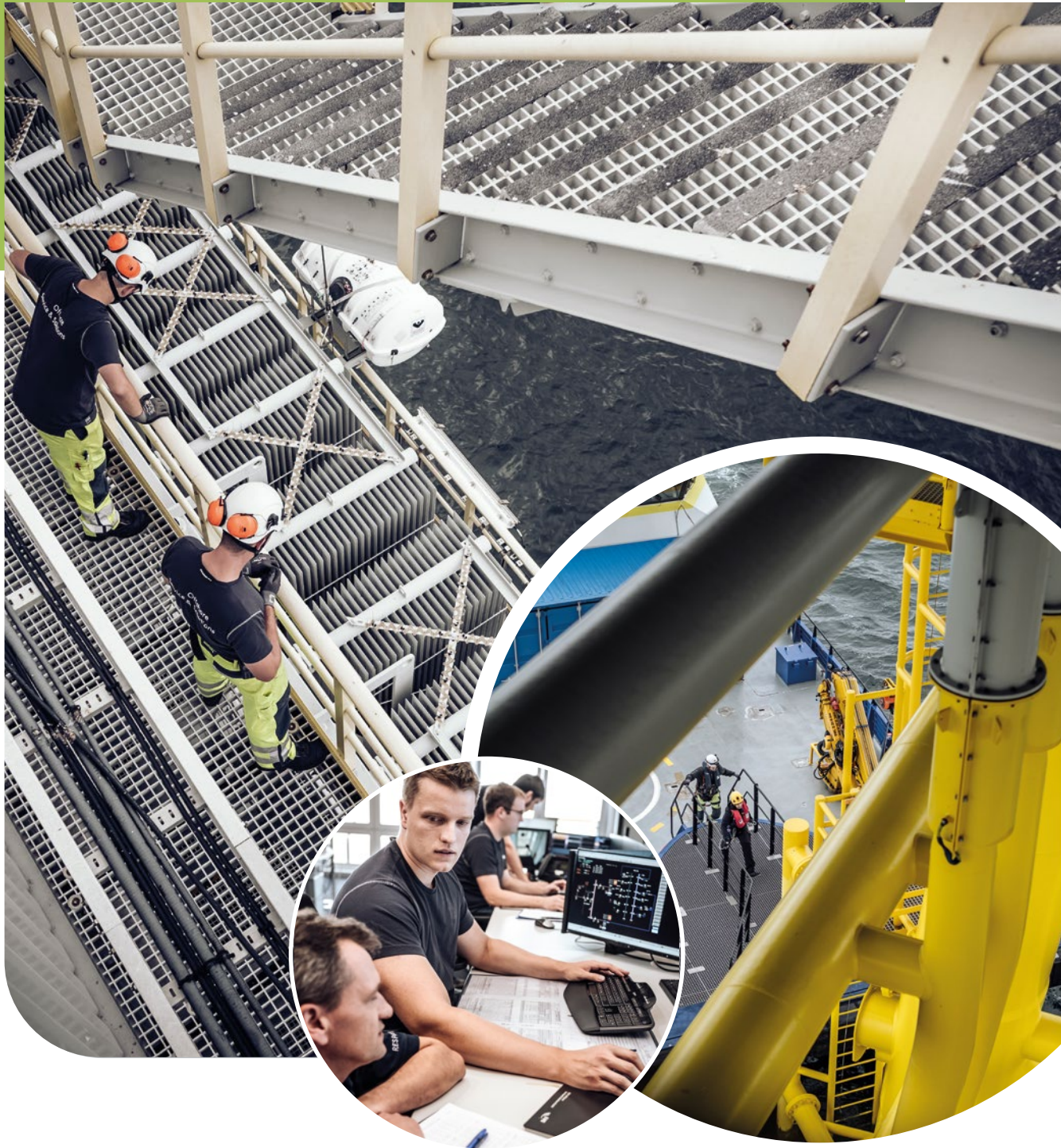


FASCINATION OFFSHORE

POWERHOUSE NORTH SEA: OMEXOM OFFSHORE RELIES ON GS-SERVICE FOR THE OPERATION AND MAINTENANCE SERVICE OF WIND FARM

USER STORY



FASCINATION OFFSHORE

Powerhouse North Sea: Omexom Offshore relies on GS-Service for the operation and maintenance service of wind farms

Since 2006, when Omexom Renewable Energies Offshore GmbH began planning Alpha Ventus, Germany's first offshore wind farm, the company has become accustomed to dealing with Superlatives: never before has an offshore wind farm been built at such a great distance from the mainland (64 kilometers) and none have stood in a greater water depth (32 meters). At five megawatts, there was no wind turbine with a higher net output. This lighthouse project became a milestone for an entire industry. During planning, construction and operation, the team of specialists based in Oldenburg defined new industry standards that are still valid today. Everything had to be entirely devised, developed and coordinated from inception. The digital backbone in almost all operational departments of the offshore service provider is the GS-Service Software Suite.

Electric Power for 7 million households

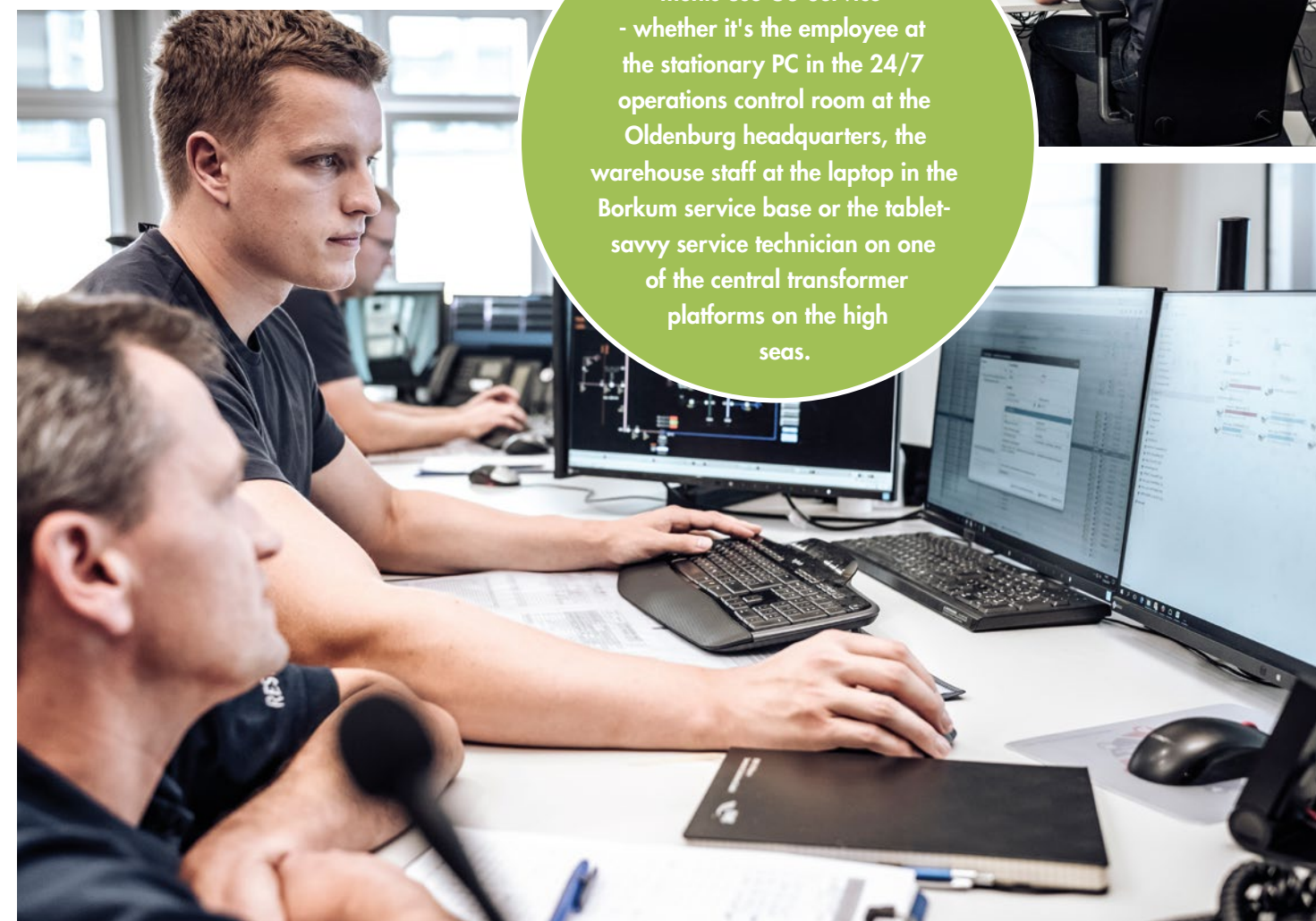
The software solution of GreenGate AG is not only the leading system for the technical management and fulfillment of maintenance orders, with the integration of different wind farms, diverse operators and various third-party service providers, GS-Service also represents the preferred digital platform for the 'Labour Market Offshore North Sea'. And it is gigantic. The wind power plants in the North Sea during 2020 delivered more electricity than ever before. In total, the amount produced increased by 12.4 percent compared to 2019 to 22.76 terawatt hours (TWh). Comparing the 4.13 TWh from the German Baltic Sea wind farms, it is evident why the North Sea is considered a powerhouse. Mathematically, seven million households can be supplied with the wind power generated offshore in Germany.

Omexom & Offshore

Whether it be as project developer, technical consultant or technical operations manager, Omexom Offshore and Offshore Services in the North Sea are often mentioned in the same sentence. After all, under the direction of the offshore experts, "Alpha Ventus", the world's first offshore wind farm under offshore conditions, went into operation in 2010 (total capacity 60 MW). And in 2013, "Riffgat" was the first commercial offshore wind farm to supply electricity from the German North Sea. With 30 wind turbines and a total installed capacity of 113.4 megawatts, Riffgat today supplies climate-friendly energy for 120,000 households. These were subsequently followed by the contracts for operation and maintenance of the substations at the Trianel Borkum West (total output 200 MW), as well as the GEMINI and Merkur wind farms in 2017/2018. Furthermore, the construction of Trianel Borkum West II was realized, Operation management is also in the hands of Omexom Offshore, in particular the transformer station and specifically the substation and the transition pieces,



Almost all departments use GS-Service - whether it's the employee at the stationary PC in the 24/7 operations control room at the Oldenburg headquarters, the warehouse staff at the laptop in the Borkum service base or the tablet-savvy service technician on one of the central transformer platforms on the high seas.



which are connecting the foundation and steel tower of each wind turbine. Since July 2020 the rotors of 32 wind turbines have been rotating at Trianel 2, supplying green electricity for around 200,000 households per year. Furthermore, the Omexom Offshore portfolio includes the maintenance service of the Nordergründe wind farm (client DWT), Luchterduinen & Prinses Amalia, Borssele III & IV, Blauwwind and Borssele V / Two Towers (client ENECO) and GODEWIND I and II (client Ørsted).

Objects, Assets, Resources

In order to manage the millions of objects, assets and operating resources, Omexom Offshore uses GS-Service. The Software for Operations Management, Maintenance and Services are what specialized service providers such as Omexom Offshore envisage: an IT cockpit with which all technical, legal tasks and conditions are initiated and documented, checked and administered.

Almost all departments use GS-Service - as well as the employees at the stationary PC in the 24/7 operations control room at the headquarters in Oldenburg, the warehouse staff on their laptops at the service base in Borkum or the tablet-savvy service technician on one of the central transformer platforms on the high seas. Via mobile applications, external service providers, who are usually responsible for the (maintenance, service, repair) of the wind turbines above the berthing (e.g. tower, nacelle, hub, rotor), can also make use of GS-Service. This is because everything, from personnel data, processes up to object data, all is stored in one central, consistent data source.

The Software Suite GS-Service

"In fact, the GS-Service System-World is the leading system and is used by all departments," explains Dustin Schuchholz, System administrator and Application supervisor from the Projects / IT department, who is responsible for GS-Service at Omexom Offshore. "The entire operational



process of operations management, is from the planning and work preparation, including resource management, execution and post-processing, right through to documentation and optimization, adds Kira Müller, Project Manager Organizational Strategies from the Operations Management department, realized in GS-Service." In detail, this is as comprehensive as it sounds; the IT-trendy term "Single Source of Truth" takes on a whole new meaning.

Omexom Offshore implements with GS-Service:

- **Marine Center**
- **Offshore Control Center**
- **Permit to Work-System**
- **Remote Switching Operations**
- **Grid Management**
- **24/7 Standby Teams**
- **Substation Maintenance Services**
- **Retrofitting**
- **Performance Management**
- **HSE Management (Health and Safety Environmental/ Occupational Health)**
- **Real Time Reporting/Monthly Reporting**
- **Monitoring of the Offshore Windfarm by the Control Room**
- **Coordination of all Service-, Repair- and Expert-Teams**
- **Planning, controlling and, if necessary, adaptation to the implementation**
- **Documentation**
- **Permanent performance optimization on all technical and operational levels**



22.76 TWh
OF ELECTRICITY

were supplied by German wind turbines in the North Sea in 2020.



7 million
HOUSEHOLDS

could be supplied with wind power generated offshore in Germany.



By 12.4 %

offshore wind power generated in the North Sea increased by 12.4 % in 2020.





We support the safety-critical activities with the labelling of potential hazards, the inclusion of occupational health and safety regulations or the monitoring of employee qualifications in the GS-Manager.

*Dustin Schuchholz,
System Administrator and
User Support from the
Projects / IT Department,
Omexom Offshore*



The Direct Line

What does the GS-Service system basically do? As a system subordinated to ERP (Enterprise Resource Planning), GS-Service integrates planning, documentation and monitoring functions as well as business applications into an information and management system. The object-oriented software - designed as a scalable client/server solution - is based on a standard technology and works under current

booking of hours. Omexom Offshore uses the GS-Web module to create "Improvement in the cooperation with contracted service providers, the coordination with customers and for reporting", explains Kira Müller. GS-Web is a browser-based application: In practice, the maintenance staff logs on to a website via tablet, smartphone, etc., and can view task lists, shift schedules, stock inventories, project progress and object-specific information such as electric circuit diagrams in the machine room. They can also view completed activities, working hours, etc. "Whereby we are not yet using time recording GS-wide at the moment", Dustin Schuchholz reports, "but we are planning to expand the cost controlling and the further development of resource planning.



With GS-Service, service operations can be planned much more quickly and reliably. Instead of planning up to three days in advance, the crew can now implement the morning before setting off.

Frank Lagemann, Executive Board GreenGate AG



Smart & Safe

Just as a wind farm operator does not engage in greenwashing, but in fact produces green electricity,

Microsoft operating systems. The advantage: GS-Service's open system architecture allows it to be linked to other systems. The operations in the GS at Omexom Offshore are accompanied by an accounting-based ERP system, JIRA & Confluence for knowledge and organizational management and also by a document management system. Via an interface, GS-Service is already linked to ROTORsoft (plant control and monitoring system). Occurring events in the monitoring system are automatically imported from ROTORsoft or are recorded manually as an event notification. The coupling of GS-Service to the ERP system at Omexom Offshore is possible as well as an interface to the envisaged reporting tool. A clear case for GreenGate, that is because the continuation of the GS-Service success story at the Omexom Offshore since its implementation in 2016 has also been based on the very intense cooperation with system provider GreenGate: Dustin Schuchholz: "We are talking about a cooperative, fair collaboration with great support. GreenGate brings a deep understanding of our processes and needs. This is necessary because offshore is challenging: very specific dynamics have to be mapped on the system side." Omexom Offshore always gives priority to the safety factor.





In practice, the maintenance technician logs onto a website via tablet, smartphone, etc. and can view task lists, shift schedules, stock inventories, project progress and object-specific information such as electrical circuit diagrams in the machine room and report back on completed tasks, working hours, etc.

protecting the health and safety of employees and service providers, that's not just a PR phrase. It must be guaranteed. After all days with no wind and a glassy sea are a dream for every service technician, but in the North Sea they are more the event of the century than the rule. In other words, Omexom Offshore's service technicians have to work from the moment they board the ship or helicopter to the moment they leave the ship, That means, from boarding the ship or helicopter, to the on-site operation, to the return on shore are closely accompanied with and by GS-Service. "We support the safety-critical activities", says Dustin Schuchholz, "with the identification of potential hazards, the recording of occupational safety regulations or the monitoring employee qualifications in GS-Manager." Therefore anyone who maintains and repairs offshore wind turbines as a service technician simply has to be qualified and have far more than altitude

and seaworthiness. Electronic, mechanical or hydraulic knowledge must be taken into account as well as a health certificate, first aid and climbing know-how, HUET (Helicopter Underwater Escape Training), Basic Safety Standards (First Aid, Manual Handling, Fire Awareness, Working at Heights, Sea Survival) etc. Relevant information on personnel is therefore also meticulously stored in the GS database by external service providers and constantly updated so that the web-based Permit to Work system integrated in the GS actually only allows qualified personnel onto the service vessel, the transformer facilities and the wind turbines. The system reduces the workload of the Omexom dispatcher, who can access the employee data once it has been stored for each assignment, regardless of the wind farm. After all, GS-Service automatically compares the upcoming service activity with the plant data and employee qualifications also stored in the sys-

tem. Even more, GS-Service forms the work approval process itself and documents it for traceability. Schuchholz: "In GS-Service, we have also realized the monitoring of equipment inspections, the mapping of the DGUV, the control and monitoring of personal protective equipment and rescue equipment as well as the monitoring of the logistics used by our service providers." Accordingly, the system itself contains information on the draught of a service vessel or the maximum permissible number of passengers. Most importantly, people tracking is carried out by the operations control center with the help of GS-Service. Nowhere else is safety such a potentially variable condition as on the high seas. Anything other than a software-supported tracking solution that encourages all employees, from the dispatcher in the control room to the service technician on site, to act in a

safety-compliant manner and to pay attention to each other, would be negligent in view of the environmental conditions.





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This is necessary because offshore is challenging: very specific dynamics have to be mapped on the system side.

Dustin Schuchholz, System Administrator and User Support Manager from the Projects / IT Department, Omexom Offshore

Plan better - Work faster



At Omexom Offshore, effectiveness in the protection of people and nature naturally goes hand in hand with efficiency. On the one hand, it is a question of the power yield of wind farm operation. After all, only a rotating wind turbine earns money and saves the climate. On the other hand, maintenance on the high seas is more cost-intensive by factors rather than percentages compared to traditional maintenance activities in offshore industrial operations. This is where the advantages of using GS-Service become apparent; board member Frank Lagemann explains

why: "With GS-Service, all service calls can be planned much more quickly and reliably. Instead of up to three days in advance, the operations management can now implement the final plans in the morning before setting off." This is already a benefit in that the service ship's arrivals and departures alone represent significant expenses in the balance sheet. In the past, it was not uncommon that ships had to call several times to supply the service technicians with the necessary replacement material. Lagemann continues: "In order to be able to consider the suitable time slots, weather services are of course also integrated into the software. Here, the wave height is also taken into account as a safety-critical condition especially when transferring from the boat to the outside platform." Ideally, calm seas and calm conditions can be combined with the shutdown of the wind turbine for maintenance and repair.

The Key User Concept works

The fact that the success of a piece of software - no matter how good it is - depends on the acceptance-based use of the software by colleagues in the company. Kira Müller and Dustin Schuchholz are well aware of this. Neither of them are IT

novices, but they very consciously rely on the participation of multipliers in all departments: "With the introduction of the key user concept, we were able to acquire employees from almost all departments. They play a decisive role in communication with the departments and act as an interface to the administrator.

"The key user concept is flanked by an internal training program and regular meetings for the exchange between system administrators and specialist departments. Dustin Schuchholz: "There is a continual exchange of wishes, ideas, improvements and further use of the systems. Everyone has access to the system, and the colleagues work creatively and actively search for use cases that we have not yet mapped. "And the Feedback after five years of use? "Positive throughout," reports Kira Müller, "More and more is happening here all the time via GS-Service. The colleagues are convinced that working in the system makes day-to-day business easier and that processes can be made more transparent. The software can do a lot and is incredibly flexible. We also receive positive feedback from our customers.

The People Tracking, which is carried out by the maintenance department with the help of GS-Service, is essential. Nowhere else is safety as potentially variable a condition as on the high seas.



APPLICATION PROFILE

Operator

Omexom Renewable Energies Offshore GmbH
(D/Oldenburg)

Sector

Offshore wind power

Supported processes

- Management and documentation of millions of objects, assets and operating resources.
- Personnel management: Certificate verification and management, access controls, verification (management of qualifications, expiry dates), people tracking.
- Coordination of all service, repair and expert teams.
- On-site maintenance with mobile devices - mobile feedback of information relevant to planning.
- Materials management.
- Initiation, documentation, verification and administration of technical/legal tasks and conditions.
- Monitoring/Controlling/Reporting.

Software utilized

GS-Service: GS-Manager, GS-Web, GS-Touch, GS-PeopleTracking, GS-Permit-Service.

Challenge

- Management and legally compliant documentation of plant infrastructure, equipment, maintenance and personnel with emphasis on certificate management.

- Automatic support of safety-critical activities, e.g. through GS-PeopleTracking and Permit-to-Work system.
- Creation of a Single Source of Truth for technical operational management.
- Integrative work in GS-Service involving employees from all departments.
- Timely and precise guidance, information and control of external service providers.

Procedure

Digital recording of plant infrastructure, equipment and personnel in GS-Service-Inventory and analysis of operating processes; development of a Permit-to-Work System; link with ROTORsoft (plant supervision and monitoring).

GreenGate-Solution

Intuitive, legally secure and dynamic data management/use/documentation in the GS-Service through Omexom Offshore and external stakeholders (Supervisory authorities, Third party service providers); System-side reconciliation of service activities, plant data and staff qualification; People tracking; Monitoring of equipment, DGUV, PSA, Rescue equipment service provider logistics.

GreenGate-Services

Integral support of process analysis, roadmap development and implementation of Operations Management System; support with initial data input; Integration of personnel management (documentation/controlling) and people tracking; Joint development of key user concept; customizing, training and support.

Conclusion

With GS-Service, Omexom Offshore manages the entire operational process of the technical management for offshore wind farms (planning, work preparation, resource management, execution and follow-up of work maintenance activities, documentation, optimization).



GreenGate AG, based in Germany (Windeck) and Switzerland (Seengen), has been developing highly adaptable and innovative software solutions for plant and infrastructure maintenance. The customers from the manufacturing industry as well as the energy, water and wind sectors use the GS-Service software in the area of technical plant and spare parts management, maintenance planning, and operations management tasks.

GreenGate AG • Alte Brücke 6 • 51570 Windeck | DE

Tel.: +49 2243 92307-0

E-Mail: info@greengate.de

Web: www.greengate.de

GreenGate GmbH • Rötlenweg 6 • 5707 Seengen | CH

Tel.: +41 62 777 1509

E-Mail: info@greengate.biz

Web: www.greengate.biz