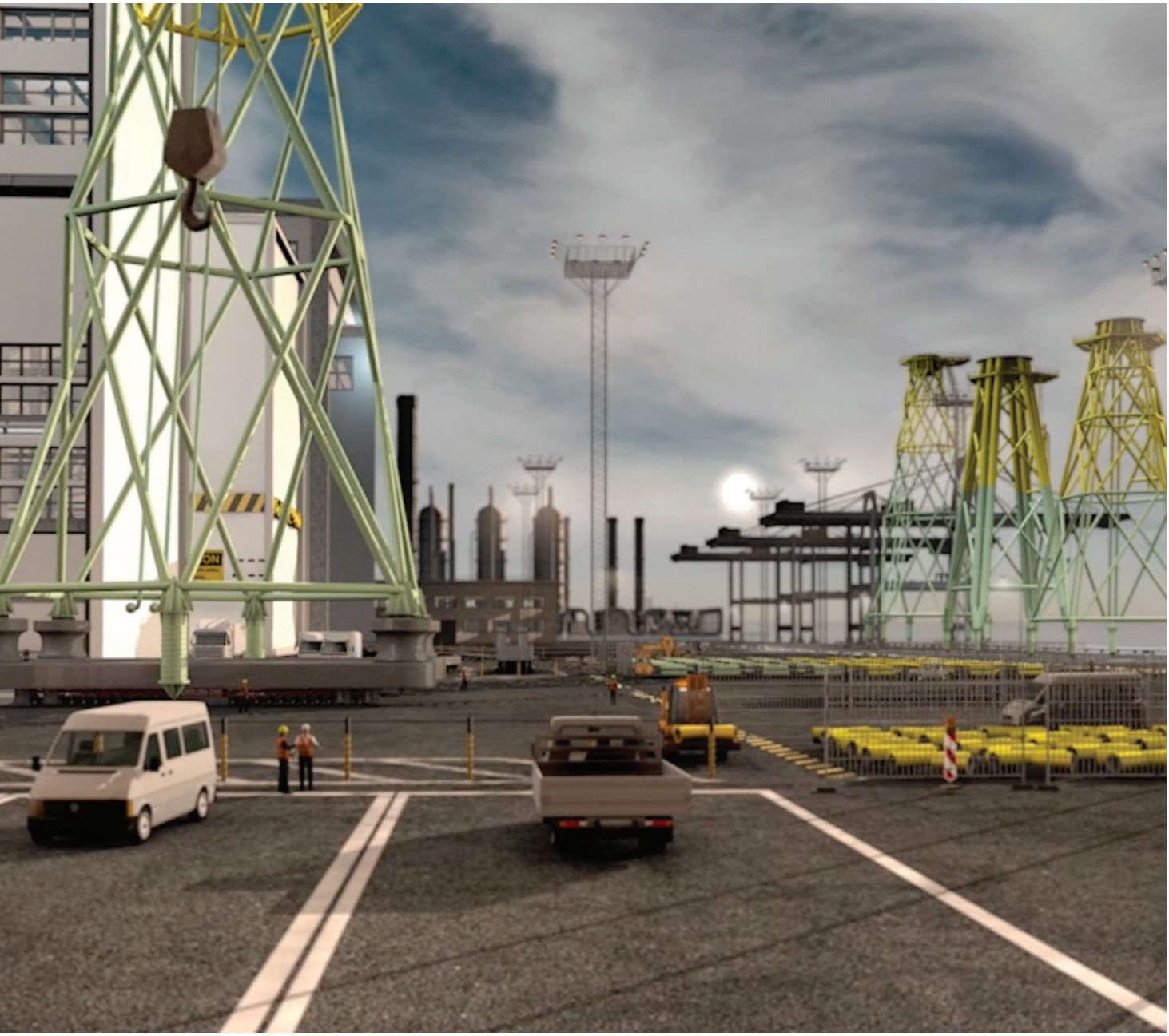
DASSAULT SYSTEMES

MARINE & OFFSHORE CASE STUDY

MARITIME OFFSHORE GROUP



MOG
MARITIME OFFSHORE GROUP

Challenge:
Specialists in offshore wind farm projects, Maritime Offshore Group needed to accelerate delivery of cost-effective wind turbine support structures for manufacturing.

Solution:
The company uses the **3D**EXPERIENCE platform on the cloud and its CATIA application for the design of the HEXABASE offshore foundation and its ENOVIA application for data management.

Benefits:
The **3D**EXPERIENCE design applications' on the cloud provide MOG with a secure and flexible environment, rapid project ramp-up and require little to no additional IT investment, resulting in a lower total cost of ownership.

POWER OF INNOVATION

The sharp rise of renewable energy sources including offshore wind farms requires construction capable of withstanding the unpredictable and often violent ocean conditions. The harsh weather exerted on maritime structures make for some of the most compelling challenges in the offshore industry. The Maritime Offshore Group (MOG) believes that thinking out of the box can lead to the right solutions. This is why the company has invested in pursuing innovative ideas and bringing them to fruition. In its short history – the company was founded in 2011 – MOG is responsible for more than 24 international patents that have improved the manufacturing efficiency, installation and longevity of its offshore structures including its invention, the HEXABASE.

"The HEXABASE is an offshore foundation structure developed for water depths between 30 and 60 meters that can support very heavy wind turbine generators," Emilio Reales, MOG founder and managing director said. "Our challenge is to design a structure that complies with legal and technical requirements and that is cost-effective to produce. What differentiates us from our competitors is that we are the first offshore foundation designers to apply the principle of design-to-cost in our developments. This has resulted in an offshore foundation that is fully standardized using few interchangeable components and standard raw materials, which allows us to rapidly customize a structure depending on water depth and wind turbine size and weight. Standardization also helps achieve economies of scale during manufacture as we take into consideration the production costs from the early concept stage, enabling us to better fulfill the end-to-end cost reduction requirements of a burgeoning renewable energy sector. This standardized approach as well as the HEXABASE's lightweight yet robust structure is most suited to the future of the offshore wind industry."

To come up with the final design, the founder of MOG modeled the HEXABASE after nature. "I conceived the HEXABASE after observing coral reefs and the way they are structured and behave," Reales said. "Corals are very light but very stable when subjected to oceanic forces such as waves and currents. The HEXABASE is modeled after these living organisms; it is light and stable yet can withstand a 50-meter-high wave while supporting a wind turbine weighing more than 500 tons with 100 meter long blades. Its light yet sturdy composition is a winning combination."

SIMPLIFYING COMPLEXITY

However, designing the HEXABASE is not an easy task. It is a lattice structure consisting of standard corner piles linked to bracings with a span less than one meter. "It is not a rectangular structure; the angles are approximately 62 degrees, which increases its complexity," Tobias Schmidt, design engineer at MOG said. "The trick is to ensure we take into consideration all the loads and external interferences exerted on the structure. Our mission is two-fold: design a structure as simple as possible that satisfies a diverse range of technical, financial and regulatory requirements and that is easy to manufacture," he said. "We needed an integrated and robust development environment that could manage the HEXABASE's many parts, and related geometric and non-geometric attributes, with superior performance and data security. This is why we chose the **3D**EXPERIENCE® platform," Alexander Sander, Head of Administration, IT & Projektmanagement at MOG said. "We also opted for the cloud because there was no need to install or invest in additional hardware or software."

Emilio Reales continued: "I didn't want to make any additional IT investments. Our core business is designing offshore structures, not burdening our IT with superfluous tasks. Dassault Systèmes has experts who do this very well and we are perfectly happy to let them manage our construction-related data and software updates for us. It is also important that we work with a reliable system so that production

"Our core business is designing offshore structures, not administering our IT. With the 3DEXPERIENCE platform on the cloud, we don't need to make any additional IT investments. Moreover, we can rapidly apply changes to our designs to assess their cost impact. This is very important."

— Emilio Reales
Founder and Managing Director, MOG

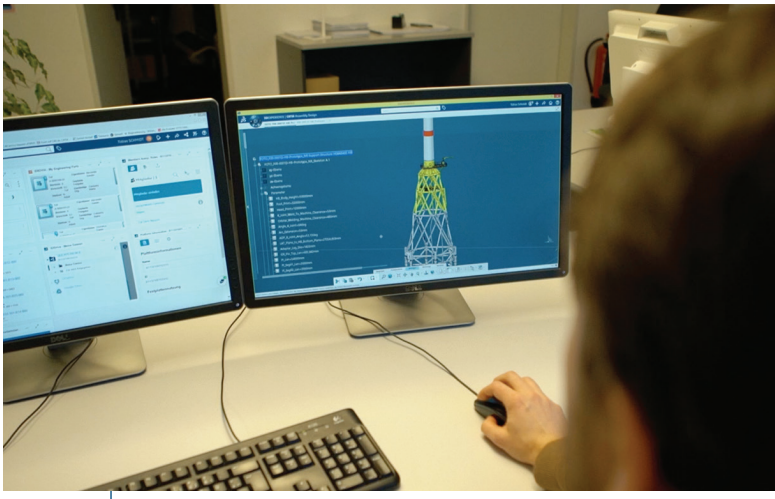
goes smoothly and errors are mitigated. The standardized approach of the HEXABASE is similar to the philosophy of the **3D**EXPERIENCE platform and its standard portfolio of applications."

SECURE AND FLEXIBLE WORKING ENVIRONMENT

When working on the cloud, data security is a valid concern. Intellectual property must be protected against data loss or unauthorized access. "It was important that our data is securely managed and stored," Sander said. "With Dassault Systèmes' ENOVIA® application, we have a high level of security, which was one of the reasons we chose **3D**EXPERIENCE on the cloud. Moreover, our engineers can access the platform at any time and any place to ensure they always work with the latest versions of the software. Once Dassault Systèmes delivers updates to the applications, we can connect to the cloud and with just one click automatically access these latest updates," Sander said.

Tobias Schmidt spoke about the on-demand philosophy of the cloud applications. "**3D**EXPERIENCE on the cloud delivers a new, more efficient way of working," he said. "Even though the platform proposes a variety of features, the user interface only displays the functions that we need. And if we need to go deeper into detail, we can," he said. "If you start with one app you just have the functionality for the part of the design you are working on. If you need a work on another part that is designed differently, then you can change the app and every function you need also changes. It's a more direct and "pure" way of working. Moreover, since all our data is on the cloud and not in individual folders and different computers, we can use the platform's powerful search capabilities to find information, for example, created in any given month or week. It saves us a lot of time," Schmidt explained. "We can also access the design history of a part to see who designed it and who made modifications since all this information is stored on the cloud. There is even a chat function that we can use to interact with other designers to get more information in real time."

Dassault Systèmes' business partner, TechniaTranscat, helped MOG get up and running with the **3D**EXPERIENCE platform and trained its users. "TechniaTranscat has a good reputation on the market," Sander said. "They have worked with many different customers in a variety of industries and are highly flexible and attentive to our needs. Thanks to their customized training, our engineers were able to rapidly learn to use the **3D**EXPERIENCE applications. Ramp-up time was short and we were proficient in more or less one day. Our relationship with TechniaTranscat is very good, as is the one with Dassault Systèmes. Through the 3DSwYm online support environment, we can submit requests for assistance and enhancements. It's a great support platform; we are very happy with it," he said.



Top image: Virtual view of HEXABASE in the **3D**EXPERIENCE platform

Bottom image: 3D Design and project management within the **3D**EXPERIENCE platform

Focus on Maritime Offshore Group
The Maritime Offshore Group is specialized in the design and development of innovative solutions for the offshore wind industry. The core competence lies in the sustainable optimization of industrial steel constructions following the "Design to Cost" (DTC) principle. Their products include amongst others HEXABASE as well as the TEXBASE offshore foundation.

Products: HEXABASE, TEXBASE

Employees: 15

Headquarters: Bremen, Germany

For more information
www.maritime-offshore-group.com

Focus on TechniaTranscat
TechniaTranscat is a leading global supplier of Product Lifecycle Management (PLM) solutions for creating and managing product information throughout the entire product lifecycle, from product planning, development and design to production, sales, training and support. With more than 500 employees including 160 ENOVIA experts and 200 CATIA, SIMULIA & DELMIA experts, TechniaTranscat possesses both the skills and knowledge needed to assist companies of all industries with their PLM initiatives.

For more information
www.techniatranscat.com

TECHNIA TRANSCAT
ADDNODE GROUP

FASTER TO CREATE AND MODIFY

The parametric capability of CATIA® is an asset that facilitates MOG's design effort. "Parametric design reduces our design costs because once we have parametrized our structure, we are easily and quickly able to make modifications and have these changes propagated throughout our design," Schmidt said. "CATIA enables us to release our designs for manufacture faster than if we had to implement each change manually."

"In terms of time savings, although it may take 10% more time to create the first fully parameterized model, we end up reducing the time needed to create models based on this first parametric model," Schmidt said. "In effect, we can create a new model approx. 10% faster than if we started from scratch every time," he said.

"We can also experiment with new ideas without "jeopardizing" the original design," Schmidt continued. "We often need to modify a design to see the downstream impact and evaluate if we shouldn't try another approach. Instead of modifying the original model, we can simply duplicate the entire structure and move or delete parts or assign different parameters and see how the copy behaves when modifications are made. We can then transfer the desired changes to the original model."

Engineers need to not only focus on the technical definition of their products but on the way they look as well. "We can be more innovative in our designs because CATIA provides high-quality rendering features with built-in lighting and shading effects, that more clearly and realistically display the way our products will look before they are built," Schmidt said.

MOG will continue to expand its use of the Dassault Systèmes applications. "In the future, we plan to combine our designs with sea data and transfer this information to the manufacturer to mitigate production errors and improve installations of our foundations. We would then like to use the finite element modeling and virtual simulation capabilities available on the platform to further develop our 24 patents related to the HEXABASE," Reales said.

Our 3DEXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3D**EXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 220,000 customers of all sizes in all industries in more than 140 countries. For more information, visit **www.3ds.com**.

3DEXPERIENCE®

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