

## ISC Case Study



Photo © ISC

### Challenge

Specialized in providing multidisciplinary engineering consultancy services, Danish consulting and engineering firm ISC is a leader in the green energy sector. One of its many offerings within engineering services is to design and develop offshore wind farm substations. As the company's project portfolio continues to grow, it needed an industry-leading platform to centralize its data, create design templates, and support it to use the latest design and engineering approaches.

### Solution

The company uses the **3DEXPERIENCE** platform on cloud to manage its global engineering projects for offshore wind and offshore oil and gas. With the *Engineering Excellence* industry solution, ISC has enhanced its design capabilities and

established a unified environment where it can collaborate seamlessly with all stakeholders. This allows it to handle design challenges with agility and deliver support at every stage, from concept design to assistance during fabrication and installation, site supervision and follow-up.

### Benefits

With all data now centrally stored on the **3DEXPERIENCE** platform, ISC can refer to previous designs to speed up the development of new projects. Access to sophisticated 3D parametric design capabilities allows the company to solve complex challenges in new ways. And by opting for a cloud implementation, the company can access the very latest functionality and focus on innovation rather than maintaining its IT environment.



**“Thanks to the 3DEXPERIENCE platform, we can take any design from off the shelf and incorporate it into a new one.”**

– Anders Thomsen, President and CEO, ISC

## SETTING THE STANDARD FOR OFFSHORE WIND FARMS

Located in the North Sea, approximately 89 kilometers off the UK’s Yorkshire coast, Hornsea Two will be the world’s largest wind farm when it goes live in 2022. Set to generate 1.4 gigawatts of power, the farm will have enough capacity to supply more than 1.3 million homes in the UK with clean electricity, spurring the country’s ongoing transition to renewable energy.

At the center of the farm, installation is underway on the offshore substation (OSS), a 7,500-ton topside installed on a six-legged jacket foundation. The largest built to date, it will collect and convert energy from 165 wind turbines into high voltage electricity, which will travel along long subsea cables and transfer to the National Grid via a reactive compensation station (RCS). Both the OSS and RCS were designed by Danish consulting and engineering firm ISC Consulting Engineers, developer of the first ever offshore substation in 2003 and a leading expert in the sector.

For ISC, Hornsea Two is a clear display of the company’s ability to deliver the entire range of tasks associated with substation design – all honed from its extensive knowledge of offshore oil and gas facilities.

“In the 2000s, we began to see signs of the offshore wind business taking off and were ideally positioned to establish ourselves in this sector,” said Anders Thomsen, president and CEO of ISC. “We have now designed more than 50% of offshore wind substations globally and our original design for the first substation forms the basis for almost all offshore wind farm substations built today.”

As ISC’s business has grown, so too have its customers’ requirements and its own IT needs. A long-term CATIA user, the company needed a platform to centrally store its extensive project portfolio and design catalog and deliver increasingly sophisticated design functionality.

“Today’s substations may share the same core design, but they are much bigger, and we’re now focused on making them as light and as easy as possible to install,” Anders Thomsen said. “History has shown us that every time a customer wants to standardize the substation design, each one ends up being unique. There is always something different. It means that our back catalog of designs is extensive, and thanks to the 3DEXPERIENCE® platform, we can take any one from off the shelf and incorporate it into a new design. We don’t have to reinvent the wheel every time we start a new project.”

## OUTSOURCING TO AN IT INDUSTRY LEADER

ISC’s shift to the 3DEXPERIENCE platform was driven by its desire to centralize all its data and future-proof its business with modern technology. By opting for a cloud implementation, it was an ideal opportunity for the company to outsource some of its IT.

“The cloud was slowly coming to our industry, and we needed an environment we could rely on,” said Christian Barlach, R&D manager at ISC. “It made perfect sense to us that we shouldn’t spend time on setup and maintenance. Dassault Systèmes has taken a lot of hassle away from us.”

Now, ISC’s team members can access new functionality and the data they need themselves using ENOVIA on the 3DEXPERIENCE platform.

“Our users don’t have to go to IT to write and check things or access data,” Barlach said. “Everything is now much more open and natural, allowing us to focus on our key tasks.”

ISC worked with long-term technology partner IPES to make the 3DEXPERIENCE platform work for its business.

“We have a long relationship with IPES going back many years,” Barlach said. “They have been instrumental in our migration and have helped us get to grips with the platform’s rich functionality. They are on the same page as us and have recently come up with a more user-friendly way of reporting issues and queries using the Dassault Systèmes community platform. It gives us full transparency.”

## MASTERING LEGACY DATA

Today, ISC can retrieve over 30 years’ worth of design work via the 3DEXPERIENCE platform.



**“If you can master your data, you can master your design.”**

– Christian Barlach, R&D manager, ISC

“Now, we have all the data in one place, and it is much easier to find exactly what we need and share it in an appropriate way,” Barlach said. “Moving away from a file-based structure, we can adopt a creative thinking approach. If you can master your data, you can master your design.”

With all projects organized on the platform, ISC’s engineers can quickly pull together the information they need.

“In a very safe way, you can pick and choose individual assemblies and put them together very rapidly without disturbing the former project,” Barlach said.

ISC uses ENOVIA POWER’BY to connect some of its legacy CAD data to the 3DEXPERIENCE platform, meaning it didn’t have to migrate all of its data to keep seamlessly accessing and using it.

“We have a lot of knowledge data in former catalogs and for us it was going to be more efficient to keep some of that within CATIA V5,” Barlach said.

Using the POWER'BY capability, ISC also has the flexibility to work with other third-party design files and programs used by its partners across the value chain.

"If we have a partner that has a preferred design tool, we can integrate the files ourselves or they can do it with POWER'BY," Barlach said. "We don't have to impose solutions on them, and it means we can collaborate with ease."

### SOLVING A MULTIDISCIPLINARY PUZZLE IN 3D

Thomsen describes the development of a substation as a very complex puzzle.

"Getting the right layout so we achieve the lowest volume and weight for the substation platform while optimizing the cabling and structural bearing system – there are a lot of things to



**"Our approach is now far more collaborative. We can bring all stakeholders into the same digital environment."**

– Erekle Tsakadze, **3DEXPERIENCE** platform and CATIA administrator, ISC

consider," he said. "Putting together all these elements is one big puzzle. We must factor everything into the design, including transportation and installation. For example, the structure is welded to the transportation vessel and must be designed to withstand movement in the sea crossing. That's where our experience and back catalog of projects on the **3DEXPERIENCE** platform comes into play."

Being able to visualize these design challenges in 3D helps ISC to come up with new solutions.

"The cable pulling arrangement is very complex but using the **3DEXPERIENCE** platform we can see what's possible and solve problems in different ways," said Erekle Tsakadze, **3DEXPERIENCE** platform and CATIA administrator at ISC. "The cables can be eight inches in diameter, so they're more like a rigid pipe, and you have to place different shackles and find the proper geometric solution for the placement of the cable to optimize the pulling arrangement. We combine all the 3D data and use the parametric approach to find the ideal solution. It wouldn't be possible to solve this in a 2D environment."

### DESIGNING IN CONTEXT

With all data managed centrally in ENOVIA, ISC can bring together multiple disciplines and stakeholders in one place to solve design challenges faster.

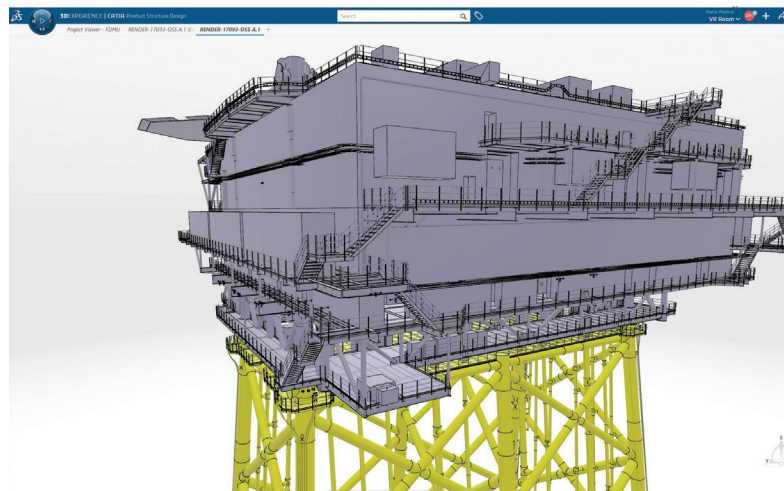
"Concurrent access was a challenge before, but we're always designing in context of everybody and we needed a platform that could support all disciplines," Tsakadze said. "Our approach is now far more collaborative. With the **3DEXPERIENCE** platform on cloud, it is possible to bring all stakeholders into the same digital environment during the design reviews. We can also fully track all changes."

### About the solution

*Engineering Excellence* on the **3DEXPERIENCE** platform provides engineering, procurement and construction companies and owner/operators with a unified environment to efficiently achieve 'zero-defect' engineering. With full project visibility within an integrated digital experience, they are empowered to design and construct innovative new facilities, improving results and reducing risks on large-scale projects.

### Benefits

- Increase output quality
- Minimize risk of complex projects and cost overruns
- Avoid engineering design rework
- Provide virtual twin for seamless handover



**Top image:** The Hornsea Two OSS is the world's largest offshore substation with a planned capacity of over 1.3GW to provide power to more than 1.3 million homes.

**Bottom image:** 3D product model of Hornsea Two offshore substation design in CATIA, managed on the **3DEXPERIENCE** platform

## Focus on ISC

ISC offers independent professional consultancy services within all areas of wind energy, oil and gas, process engineering, construction, and infrastructure in Denmark and internationally. Headquartered in Copenhagen, the company's main goal is to generate technical and environmentally acceptable solutions that meet the client's demands and keep up with the evolution and goals of society.

For more information: [www.isc.dk](http://www.isc.dk)

## Focus on IPES

IPES sells and implements PLM and 3D software solutions that support and optimize the entire process from idea to implementation, supported by Dassault Systèmes, software partner since 2006. The company strives to help its customers optimize and automate their development processes and working methods using 3D engineering, paving the way for enhanced innovation and greater profitability.

For more information: [www.ipes.dk](http://www.ipes.dk)



This has been key when the company's main office works remotely on large-scale projects with its office branches.

"We are all connected through the **3DEXPERIENCE** environment, which makes it possible to work on the same job," Barlach said. "For example, on a recent substation project, we were able to work together like we were all sat in the same office. Our remote colleagues can view all the data they need and access it from the web."

## SET UP FOR THE NEXT GENERATION

While the **3DEXPERIENCE** platform has changed some of the ways ISC approaches its work, the company sees it only as a benefit.

"We have a lot of experienced people used to IT in a certain way and sometimes we have to rethink that and adapt to new ways of working," Barlach said. "They had to become comfortable

not seeing their files on a Windows server, for example. But the things they found different, they could see the value in. We're learning as we go and building our own best practices."

The company is now able to bring new, inexperienced users onto the platform and get them working productively faster.

## VIRTUAL TWIN VISION

As ISC looks ahead, it is exploring the potential of using virtual twin experiences to ensure the seamless transition between all phases of an infrastructure project, including running, maintenance, and end of life of the asset.

"Creating a virtual twin is something we've always been hoping for," Barlach said. "We'll need everyone in the supply chain to understand that it makes good sense to spend more time and money on the design upfront so it's complete and leaves no decisions to be made during fabrication. As the industry moves towards a turnkey construction contracts (EPC) approach, I can see the need for this more precise digital representation to carry out operations more efficiently. We want to evolve the industry using the platform."

ISC has no doubt that Dassault Systèmes and IPES are the best partners in the industry to work with and bring this vision to life.

"When we first began using CATIA in the early days, it fulfilled everything we were looking for," Barlach said. "Our competition was always typically using something else, but we didn't find a compelling reason for change. In the end, it turns out we selected the best vendor that has the strongest position today. I feel certain that we're in the right position to fulfill our vision with the **3DEXPERIENCE** platform."

## Our **3DEXPERIENCE**® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE** Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our **3DEXPERIENCE** platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 290,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



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