

# 附录：其他技术服务：海上风电服务项目案例

## 1) 电气安装技术服务-北海丹麦项目最佳分包团队

# WIND FARM IN DENMARK ORDER FOR OFFSHORE



An EQIN team recently traveled to Esbjerg in Denmark to deliver and install equipment on board the Brave Tern and the Blue Tern (formerly Seafox 5). Both ships are used for the offshore installation of wind turbines for the new Hohe See wind farm in the North Sea. The supply of EQIN equipment in Esbjerg is now also in full swing.

The team was on board the Brave Tern for two weeks to install cables, cable ducts and distribution boxes. The power supply was already on board. On board the Blue Tern, the power supply has been installed with three remote readable 150 kVA generators in load sharing, distribution boxes, transformers and 270 meters of cable ducting.

Initially, it was the intention that most of the work would take place when the two ships were alternately docked in Eemshaven. But the EQIN-team and all equipment were hastily transported to Esbjerg, due to changes in the planning of the client, Fred. Olsen Windcarrier.



To reach its verdict, the client listed the performance of all the contractors involved in the Turnaround and selected the best ones.

A delegation from the team was present to receive the award.

The EQIN team, which has previously already won 8 silver and 3 gold awards for its safety performance during the Turnaround, received an A-award from the client.

## NICE COMPLIMENT FROM AN ENTHUSIASTIC CLIENT

A client in Rotterdam Botlek has given the EQIN team a wonderful compliment for its performance during a major Turnaround. Together with eight other contractors, EQIN was voted best contractor in the field of safety, quality, efficiency and cooperation.

## 其他技术服务：海上风电服务项目案例

### 2) 临时电力供应租赁服务 – 荷兰Merkur项目



EQIN'S PROMISING  
NEW MARKET ENTRY



What started at the end of 2017 with the request to supply 12 30 KVA aggregates for offshore usage, developed into a large award in one of EQIN's, Stork's equipment rental division, new target markets: the renewable energy sector.



80 kilometers (about 50 miles) north of the coast of the dutch town of Eemshaven, a new wind park called Merkur is being constructed. this wind park consists of 66 haliade 6 Megawatt wind turbines, which produce 396 Megawatts of electricity. Enough to supply 500,000 households.

prior to construction, the various wind turbine parts were shipped to the Eemshaven harbor for onshore pre-assembly. during this process, EQIN, **Stork's rental and sales division**, **supplied power and storage facilities**, as well as personal protection equipment. on a weekly basis, EQIN's supervisor evaluates the supply and demand of the required equipment and the potential need for additional materials. EQIN's site-based service engineer provides a weekly check-up of the installed power aggregates.



In March 2018, the transportation vessel Seafox 5 shipped the first wind turbine parts from the Eemshaven harbor to the new north Sea wind park. EQIN supplies the temporary onboard power needs, using innovative aggregates with load-sharing modes, for remote system readouts. this allows EQIN to manage peaks in electricity production, as well as to secure backup when the power drops or is cut off completely.



其他技术服务：

### 3) 壳牌北海BRENT BRAVO海上原油平台拆解工作，节省项目费用40%

## GENERATING MAJOR COST SAVINGS

## FOR SHELL'S BRENT BRAVO TOGETHER

As part of a pilot project from the UK's Engineering Construction Industry training Board (ECitB), Stork, Wood Group and Shell are working closely together on the decommissioning of Brent Bravo, an oil platform in the north Sea, reducing project costs by 40%.



### BUNDLING STRENGTHS

In the UK, members of the ECitB have pooled their experience in the oil and gas industry. on the basis of this expertise, they have laid out a framework that facilitates effective and broader collaboration between various parties. this helps to achieve a more effective and consistent project implementation. the project framework consists of four phases:

1. Generating a collaborative environment.
2. defining a collaborative project.
3. Implementing the collaborative project.
4. Conclusions and lessons learned.

### STREAMLINING FOR SYNERGY

the ECitB pilot is being implemented on the decommissioning phase of Shell's Brent Bravo asset, specifically the removal of the topside. the project team is a unique joint effort between the three companies. their aim is to not only work alongside each other, but to truly collaborate to implement the project. for example, instead of each company providing its own project manager or health, safety, environmental, quality (hSEQ) manager, there is now only one person responsible for each project discipline, selected on the basis of his/her knowledge and expertise. that could be someone from Stork, Shell or Wood Group.

### MULTIPLE COMPONENTS, ONE END GOAL

project teams are comprised of employees from all three companies. Each team's composition and size can be adjusted as and when required, which helps to prevent unnecessary waste of time or personnel.

Moreover, all pilot participants are working together as one team, one organization, from one location. project reports, working methods and procedures are all identical.

### TANGIBLE SUCCESS

the pilot project has been running for more than a year, and has proven to be very successful. When compared to similar decommissioning work in the past, the project has realized a more than 40% cost savings on specific work and a 20% reduction in project team size.

this collaborative method provides significant advantages not only for the contractors involved, but also (especially) for Shell. the client has one point of contact and benefits from enhanced structure, avoiding inefficiencies surrounding personnel, and benefitting from a quick decision-making process. In short: outcomes that achieve significant savings in cost, time and efficiency.



# 4) Stork-挪威石油：北海Mariner服务项目

## GETTING STATOIL'S MARINER PROJECT

**签订五年海上服务合同，包括：涂料、被动防火、保温隔热、传动装备、起重技术援助、铝制脚手架和绳索访问服务、采暖通风和空调(HVAC)，以及法兰管理 (智能iBolt) 合同。**

Through an effective combination of products and services, Stork supports a safe and reliable start to the Mariner A Platform in the North Sea, whilst also contributing to the hook-up and commissioning phase through Aker Solutions.

Statoil conducts a wide range of activities in the United Kingdom (UK), including offshore wind, upstream operations, natural gas trading and crude oil sales. Statoil is increasing their investment on the UK continental shelf (UKCS) through the development of the Mariner field. It is an ambitious 30-year project that represents one of the largest capital expenditure commitments on the UKCS in more than a decade; with a gross investment of more than USD 5.8 billion. Discovered in 1981 on the East Shetland Platform, approximately 150 kilometers (93 miles) east of the Shetland Islands, the Mariner field is a sizeable prospect for oil and gas producers. In December 2012, Statoil and its partners decided to invest in the Mariner project.

挪威国家石油公司在英国开展广泛的业务包括海上风能、上游业务、天然气贸易和原油销售。通过开发Mariner油田，挪威国家石油公司增加了对英国大陆架(UKCS)的投资。这是一个雄心勃勃的30年项目，是10多年来英国最大的资本支出承诺之一；总投资超过58亿美元。

Mariner油田于1981年在设得兰群岛以东约150公里(93英里)的东设得兰平台上被发现，对于油气生产商来说，这是一个相当大的前景。2012年12月，挪威国家石油公司及其合作伙伴决定投资Mariner项目。

With initial production expected in 2018, the development of the Mariner field will contribute more than 250 million barrel reserves, with average plateau production of around 55,000 barrels per day. It will also support a significant number of jobs in the UK supply chain.

Mariner油田预计将于2018年投产，其开发储量将超过2.5亿桶，平均日均产量约为5.5万桶。它还将为英国供应链提供大量的工作岗位。



### STATOIL IN PARTNERSHIP WITH STORK

Statoil awarded Stork the offshore services contract in the summer of 2014. A five-year deal, with two-plus-two-year extension options, which will see Stork's multi-skilled technicians provide a wide range of integrated fabric maintenance and access solutions. These include: coatings, passive fire protection, insulation, rigging, lifting technical assistance and scaffolding and rope access services. This is coupled with additional specialist services, such as heating, ventilation and air conditioning (HVAC), and the most recent contract award win, flange management, which is now to be included in the overall offshore services contract.

### 挪威国家石油公司与施托克公司合作:

2014年夏天，挪威国家石油公司授予Stork海上服务合同。一份为期五年的合同，外加两年多的延长选项，这将使Stork的多技能技术人员提供广泛的综合维护和访问解决方案。这些包括：该合同现在将被包括在整个海上服务合同中涂料、被动防火、隔热、传动装备、起重技术援助、脚手架和绳索访问服务。此外，还提供了额外的专业服务，如采暖、通风和空调(HVAC)，以及最近赢得的法兰管理合同。

### MANAGING PROCESS CONTAINMENT 管理过程控制

Stork's onsite machining and bolting product line secured the flange management works in May 2017. The works include the utilization of Stork's advanced electronic flange management software package, iBolt. This pioneering software incorporates radio-frequency identification (RFID) and barcode reading functionality. Along with anomaly reporting and photograph storage capabilities, this provides an audit trail which exceeds current UK Health and Safety Executive (HSE) guidelines. Using RFID technology to identify flanged and small-bore tubing (SBT) joints, this technology mitigates the risk of misidentification on safety-critical, hydrocarbon joints.

2017年5月，Stork的现场加工和螺栓生产线确保了法兰管理工作。主要工作包括使用Stork公司先进的电子法兰管理软件包iBolt。这款开创性的软件结合了射频识别(RFID)和条形码读取功能。连同异常报告和照片存储能力，这提供了审计跟踪，符合目前英国健康和执行局(HSE)的指导方针。利用RFID技术识别法兰和小口径油管(SBT)接头，iBolt降低了安全关键的碳氢化合物接头被错误识别的风险。



This advanced software, along with Stork's highly competent technicians and our proven Behavioral Changes in Flange Inspection and Assembly Techniques training course, all help achieve a leak-free start. This reiterates Stork's core belief that prevention, and not the repair of leaks, is fundamental in adding value to clients as part of their hydrocarbon leak-prevention plans. The system is soon to be implemented throughout the Mariner field development. Stork is currently providing Statoil personnel with training in how to use it.

这一先进的软件，加上Stork高度称职的技术人员和我们在法兰检测和装配技术培训课程中经过验证的行为改变，所有这些都助于实现无泄漏的启动。这重申了Stork的核心理念，即预防而不是修复泄漏，是为客户增加价值的基础，是其油气泄漏预防计划的一部分。该系统很快将在整个Mariner油田开发中得到实施。Stork目前正在为挪威国家石油公司的人员提供如何使用该设备的培训。

### AKER SOLUTIONS COLLABORATES WITH STORK

Also in 2014, Statoil awarded Aker Solutions, global provider of products, systems and services to the oil and gas industry, the Mariner maintenance and modification services contract. The five-year framework agreement will see Aker Solutions deliver the maintenance planning system in the pre-operations phase of the development, as well as support services during the hook-up and commissioning phase (HUC). Aker Solutions was additionally awarded the overall HUC support agreement by the main South-Korean-based contractor, who built the Mariner modules locally and is responsible for delivery of the offshore HUC scope up to mechanical completion. Its strong track record in HUC services made Stork the ideal partner of choice. As such, Aker Solutions awarded Stork the scaffold and fabric maintenance services contract for the HUC phase of the Mariner A platform.

### AKER SOLUTIONS与STORK合作

同样在2014年，挪威国家石油公司将Mariner油田维护和修改服务合同授予了Aker Solutions公司，该公司是油气行业产品、系统和服务的全球供应商。根据这份为期五年的框架协议，Aker Solutions将在开发的前期运营阶段提供维护规划系统，以及在连接和调试阶段(HUC)提供支持服务。Aker Solutions公司还获得了韩国主要承包商的连接调试整体支持协议，后者在当地建造了Mariner模块，并负责海上连接和调试范围的交付，直到机械工程完成。据Stork在连接和调试服务方面的良好记录使Stork成为Aker Solutions的理想合作伙伴。因此，Aker Solutions公司授予Stork Mariner A平台连接和调试阶段的脚手架和织物维护服务合同。

### FOCUS ON LIGHTWEIGHT SCAFFOLDING

During the contract, Stork will place a significant importance on the use of lightweight, aluminum system scaffolding, which will help increase productivity and generate overall cost savings for the project. Stork's onshore teams have already commenced work in Aberdeen, UK, mobilizing circa 40 metric tons of the system scaffolding to South Korea, where the component modules were under construction. Stork will continue to mobilize further shipments as the HUC work progresses. Stork will deliver rigging support, coatings, insulation, passive fire protection and rope access solutions to Aker Solutions during the HUC scope.

### 注重轻量级脚手架

在合同期间，Stork非常重视轻型铝系统脚手架的使用，这将有助于提高生产力并为项目节省总体成本。Stork的陆上团队已经开始了在英国阿伯丁的工作，调集了大约40吨的系统脚手架到韩国，那里的组件模块正在建设中。随着连接和调试工作的进展，Stork将继续筹措下批发货。Stork将在连接和调试范围内向Aker提供转动装置、涂料、隔热、被动防火和绳索访问解决方案。

