CHANGING THE GAME AT SEA

64



SH GROUP

Corvus Energy Co-Develops FIRST-OF-ITS-KIND Marine Battery Container With SH Group Marine electrification is a key factor in reducing carbon emissions from shipping, and it ceased to be a pipe dream long ago. Marine-approved battery technology from market-leading companies such as Corvus Energy is available today, allowing designers, system integrators, and shipowners to work towards greener shipping through strategies such as peak shaving, spinning reserve, and load levelling.

However, the fact that battery technology is available does not necessarily make it easy to install and operate. How can shipowners go electric without taking vessels out of service for months of complicated and costly retrofit work? And is it possible to combine the need for electricity with the need for operational flexibility? With the BOB concept offered by Corvus Energy, the answer to both questions is yes.

BOB: plug 'n' play marine electrification

The BOB (Battery On Board) concept consists of a type-approved, A60 classified shipping container filled with Corvus Energy's tried and tested Orca energy storage systems. The solution can easily be installed on a ship, and systems such as cooling, fire-fighting, and battery management can be connected quickly, making the concept a truly plug 'n' play marine electrification solution.

The BOB container can easily be moved from ship to ship, and from port to port, making it an attractive proposition for shipowners looking for a quick way to refurbish vessels for short or long-term leases for operation in sensitive marine areas. For example, many offshore operators in the North Sea are required to have batteries on board. "It's a flexible solution that is easy to install and reduces the complexity and the risks involved in using batteries on ships," says Ove Løberg, Vice President Projects at Corvus Energy. "The fact that we provide a complete solution makes life easier for system integrators. They get a completely approved standalone container without having to do the engineering work themselves."

SH Group adds competences

While Corvus Energy is a world-leading battery manufacturer, they quickly decided that they needed to work with an external partner on the container and auxiliary systems.

"We decided to outsource the container part because we don't have those skills at Corvus," explains Ove Løberg. "Batteries are our core competence, but we needed to add competences, for example in steel engineering, to complete this project. We carried out an open tender which attracted several bidders.

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Ove Løberg, Vice President Projects, Corvus Energy



"If we were to develop the container ourselves, we'd have to set up an entire project organisation for that purpose. We would probably have spent a year or more developing those competences in-house," adds Gunnhild Hystad, Technical Sales Engineer at Corvus Energy.

The project kicked off in early 2021, and Corvus Energy were well prepared for the job, working closely with the classification society to define project requirements. The classification society even participated in the kick-off meeting with SH Group so that everyone knew from the start what was to be done.

Overcoming challenges together

Martin Jensen, Service Project Manager at SH Group, appreciated the fact that Corvus Energy had done their homework. "Knowing exactly what the customer needed was a great help to us," he says. Together with Project Engineer Rasmus Madsen from SH Group and in close cooperation with Corvus Energy, he designed a prototype 20' shipping container that would match Corvus Energy's requirements and DNV GL class requirements (DNVGL CP 0553 Containerized systems Edition June 2020).

"The main challenge was to squeeze as much battery capacity as possible into the container and still find space for things like cooling and fire-fighting," says Ove Løberg. "We have 1,492 kWh of power in our prototype 20' container. It's a very compact solution which includes everything needed in a battery room, and it is compliant with class society requirements, of course!"

"It was definitely a challenge," adds Martin Jensen with a smile. Container ventilation in particular was a tough nut to crack due to the very limited space above the batteries. Also, the complete container had to weigh in at 30 tonnes or less to comply with class requirements, and as the batteries themselves weigh around 16 tonnes, there is not much spare capacity.

Great and open cooperation

This and other technical difficulties were resolved through open and constructive teamwork and a willingness to come up with alternative solutions and new approaches.

"We start with an empty slate and start finding solutions," says Martin Jensen. "On this project, we really had to think outside our comfort zone to find solutions that worked, but that's what makes this kind of thing interesting. And we did find solutions that work!"

"I think our cooperation has been very good," says Ove Løberg. "We had weekly online meetings throughout the project period to discuss technical details. The dialogue has been very open throughout, and we've been able to focus on the plan and carry it out".

Gunnhild Hystad adds, "On earlier projects, I have sometimes had the sense that either the customer or the supplier kept their cards very close to their chests. The open collaboration in this project has helped us be very effective."

The SH Group project team carefully selected the best-suited component suppliers for systems such as fire-fighting, cooling, thermal runaway protection, and so on, developing the project along the way. "It's been an ongoing process, and a really exciting one," remarks Flemming Slumstrup, Head of Electrical Service at SH Group. "The prototype that we have developed today is quite different from the idea we started with."

A milestone towards greener shipping

In November 2021, the prototype 20' container passed a crucial milestone: A successful factory acceptance test (FAT) at SH Group's facilities confirmed that the solution works as it should, delivering the power and control required in a safe manner. The test is an important step in Corvus Energy's strategic efforts to contribute to greener shipping worldwide.

"It's Corvus Energy's mission to contribute to reducing carbon emissions, and we want to make it easier for our customers and system integrators," says Ove Løberg. "With our complete package, getting batteries on board ships can be done easier, quicker, and more cost-efficiently." For SH Group, the project has reconfirmed the company's ability to deliver andcoordinate a wide range of marine services, from project management over steel engineering to electrical works. "The most important thing for us is to be part of this partnership and help Corvus reach their goals," says Flemming Slumstrup. "Our purpose was to help deliver one of the building bricks required for hybrid and electrification projects, and we succeeded!"

With the BOB concept, the first of its kind in the marine market, Corvus Energy expects to be able to combine its green ambitions and business objectives in a true winwin solution. When asked about the most important outcome of the project, however, Gunnhild Hystad points to a third factor.

"The most important benefit for us has been gaining knowledge and competences. It helps us understand customer requirements and deliver solutions that the customer actually needs," she says.

Ready to go

Meanwhile, the 20' BOB concept container is fast becoming ready for the market as a result of the great cooperation between Corvus Energy and SH Group.

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Plug 'n' play

First class-type approved A60 certified shipping continer solution

"We have 1,492 kWh of power in our prototype 20' container. It's a very compact solution which includes everything needed in a battery room, and it is compliant with class society requirements"

Shipowners can now get a true plug 'n' play marine electrification solution. "This is the first class-type approved, A60 certified shipping container solution that is actually built and ready for use," concludes Martin Jensen.

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"You get a complete, ready for use product. You don't have to buy batteries, the container, and other systems separately and worry about the integration yourself. It's all ready to go, and this is the first of its kind with this capacity in the world". "With our complete package, getting batteries on board ships can be done easier, quicker, and more cost-efficiently." For SH Group, the project has reconfirmed the company's ability to deliver and coordinate a wide range of marine services, from project management over steel engineering to electrical works.



SH Group and Corvus Energy common picture

Key technical specifications	Costumised BOB prototype values
Container Size	20' Container
Classification	A60
Batteries	Corvus Energy Orca
Battery Power	1,492 kWh
Type Approval	DNV GL
Cooling	Connects to vessel water cooling circutis
Fire-Fightning System	Water mist
Thermal Runaway Protection	Exhaust ducts

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Martin Jensen, Service Project Manager, SH Group

Here's how we did it!

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Watch the video on youtube



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Watch how we did it **Scan the QR Code**

Full costumized battery container 20' installed with fire system

Corvus Energy

Many fossil-fuelled ships can be retrofitted to run wholly or partially on electricity, including the use of shore power in ports. SH Group offers customised turnkey solutions that take the hassle out of electrification

The project team poses in front of the BOB 20' prototype. Left to right: Rasmus Madsen (SH Group), Martin Jensen (SH Group), Ove Løberg (Corvus Energy), Gunnhild Hystad (Corvus Energy), and Erik Fremming Aurbakken (Corvus Energy)

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