

Case study

Onboard Ship Energy Storage System Norway

Project Summary

Project: Seasight Ferry

Location: Norway

Application: Onboard Ship Energy Storage System

Battery Energy Storage System

- Total energy: 500 kWh
- Maximum C rate: 3
- DC network voltage range: 600-825 V
- Earth connection diagram: IT (no pole grounded)

Nidec's Role

Nidec Industrial Solutions supplied a Battery Energy Storage System integrated on an award-winning 400-passenger ferry that enables it to operate on 100% electric power, when needed.

Scope of Supply

- Battery modules in a rack configuration
- Battery racks in aluminum
- Data-logging equipment
- Master battery management system
- Closed air cooling system
- Ship and battery system interface



The challenge:

To design and supply a battery energy storage system for a luxury, 42-foot catamaran

After the success of the 1st passenger ferry, the client decided to proceed with a second ship. Constructed of lightweight carbon fiber composite, this new ferry – a 42-foot-long catamaran – carries passengers on sightseeing trips through a fjord off the coast of Norway like its sister ship.

One of the main challenges and keys to our success is proper battery management and safety to avoid overheating which can also lead to premature degradation.

The solution:

Fully integrated, combined Power and Energy Management System with active cooling



Maintaining batteries at proper temperatures is critical to ensure the long life of the battery and to avoid premature degradation. Our cooling solution is a combined liquid / air cooling system. Cold water is used to cool the air in the battery room. Fans blow the air through each module, directly cooling the surfaces of the cells so as to ensure a uniformly cooled system.

The control system manages all the battery racks and offers a single interface to the ship Power Management System, as well as an HMI and operator panel showing full battery status. Remote monitoring can be enabled.

Each sub-system comes with bus bars and electronics and specific safety features including fuses, circuit breakers and emergency shut-down systems.

To prevent humid, salty air coming in contact with the batteries' modules, the BESS is housed in an unventilated, air-tight room. Nidec's design of a closed-loop dual heating and cooling system uses an air-to-water heat exchanger to maintain the battery's internal temperature within the prescribed range of 18°C to 28°C. This project was developed together with ZEM using LG Chem batteries.

This is not the first time the two companies have collaborated together to deliver world class energy storage systems in the maritime sector.

	ENERGY	COMBINED POWER & ENERGY
MODULE		
Energy	6.5 kWh	6.6 kWh
Voltage	42.0-58.8 51.8 V nominal	42.0-58.8 51.8 V nominal
Dimensions (mm)	445 x 110 x 590	445 x 110 x 590
Weight	44 kg	47 kg
Max C-rate	1 C	2 C

RACKS	14 module	17 module	14 module	17 module
Energy	91.3 kWh	110.9 kWh	92.3 kWh	112.1 kWh
Voltage	588-823 V 721 V nom	714-1000 V 881 V nom	588-823 V 721 V nom	714-1000 V 881 V nom
Weight	790 kg	930 kg	840 kg	990 kg
Dimensions (mm)	520 x 670 x 2000	520 x 670 x 2300	520 x 670 x 2000	520 x 670 x 2300



ZEM - Zero Emissions Maritime solutions