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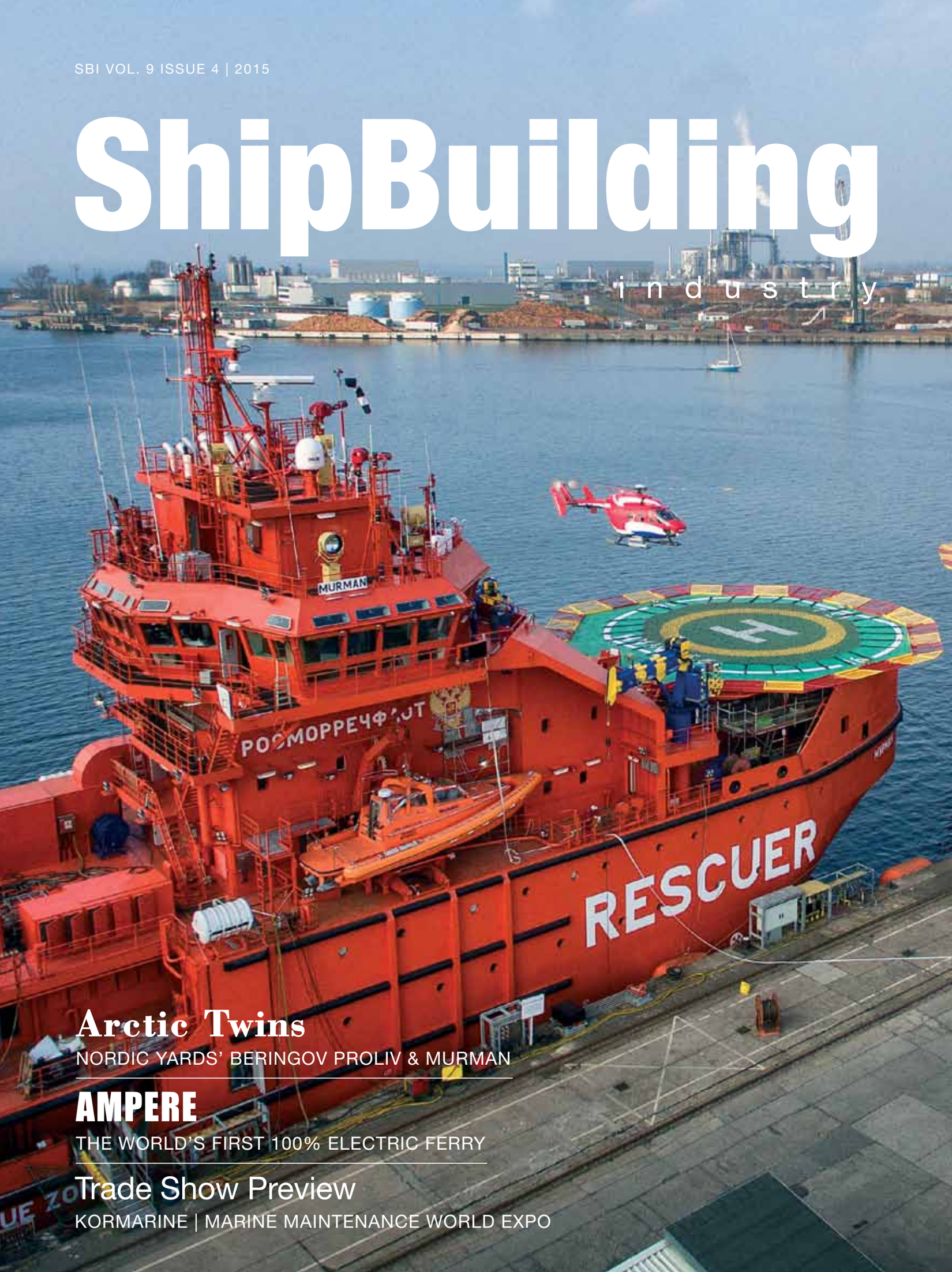
ShipBuilding industry.



Arctic Twins
NORDIC YARDS' BERINGOV PROLIV & MURMAN

AMPERE
THE WORLD'S FIRST 100% ELECTRIC FERRY

Trade Show Preview
KORMARINE | MARINE MAINTENANCE WORLD EXPO

Ampere

THE WORLD'S FIRST ELECTRIC FERRY

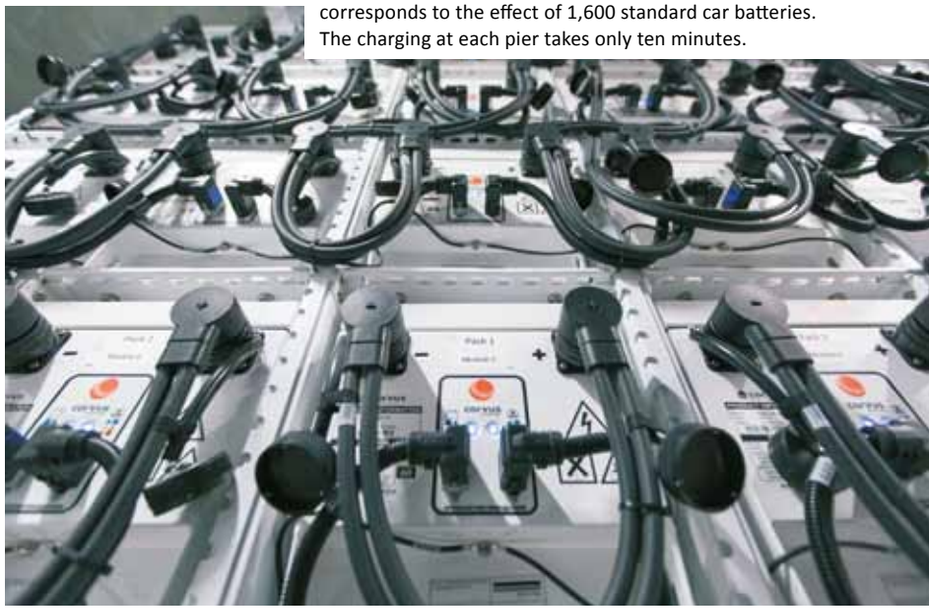
HOW A GOVERNMENT CONTEST YIELDED THE WORLD'S FIRST ELECTRIC CAR AND PASSENGER FERRY IN THE WORLD. FIVE YEARS AGO, THE NORWEGIAN MINISTRY OF TRANSPORT AND COMMUNICATIONS AND THE PUBLIC ROADS ADMINISTRATION launched a competition to develop the most environmentally friendly ferry. Emission-free, quiet ships that are in keeping with the idyllic surroundings. The winner was awarded a 10-year concession for the ferry link between the villages of Lavik and Oppedal along the Sognefjord. Norwegian shipbuilder Fjellstrand's knowledge of energy-efficient shipbuilding together with Siemens' electric propulsion expertise resulted in a win: the 'Norled-owned' Ampere.»

OPTIMAL ENERGY

The energy management system (EMS) is preprogrammed with curves giving engine fuel consumption under different load conditions. The EMS interfaces with sub-controllers for gensets, thrusters and remote controls to monitor and set optimal engine speed.

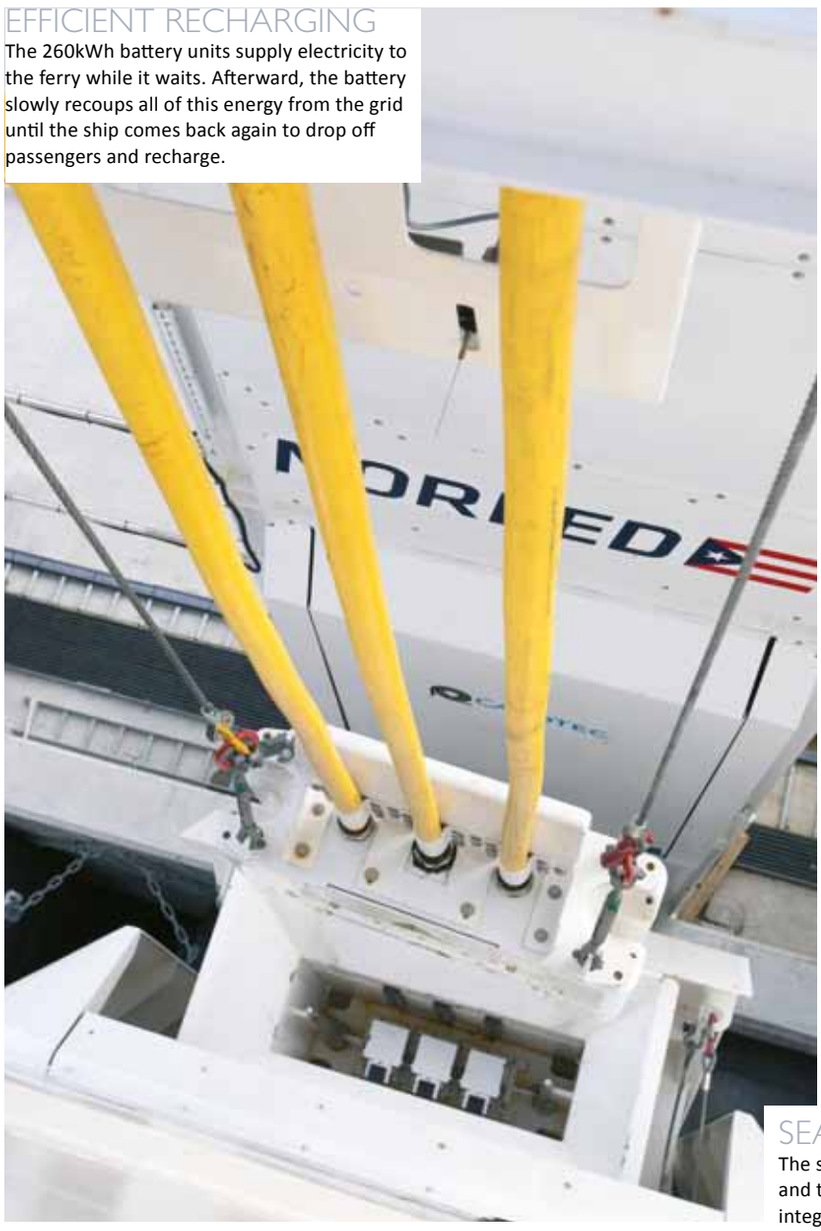
RAPID CHARGING

The battery pack on board, like the ones on each pier, corresponds to the effect of 1,600 standard car batteries. The charging at each pier takes only ten minutes.



EFFICIENT RECHARGING

The 260kWh battery units supply electricity to the ferry while it waits. Afterward, the battery slowly recoups all of this energy from the grid until the ship comes back again to drop off passengers and recharge.



The Ampere was developed from the ground up as an electrically powered vessel, made exclusively of aluminum. With three battery packs, one on board and one at each pier, the ferry only uses 150kWh per route, which corresponds to three days use of electricity in a standard Norwegian household. Siemens developed the ferry's drive system and put up charging stations with lithium-ion batteries, which are charged from renewable energy, namely hydro power.

The ferry represents a milestone on the road to operating completely emission-free ferries along Norway's long coastline, with at least fifty other routes currently able to sustain battery-operated vessels.

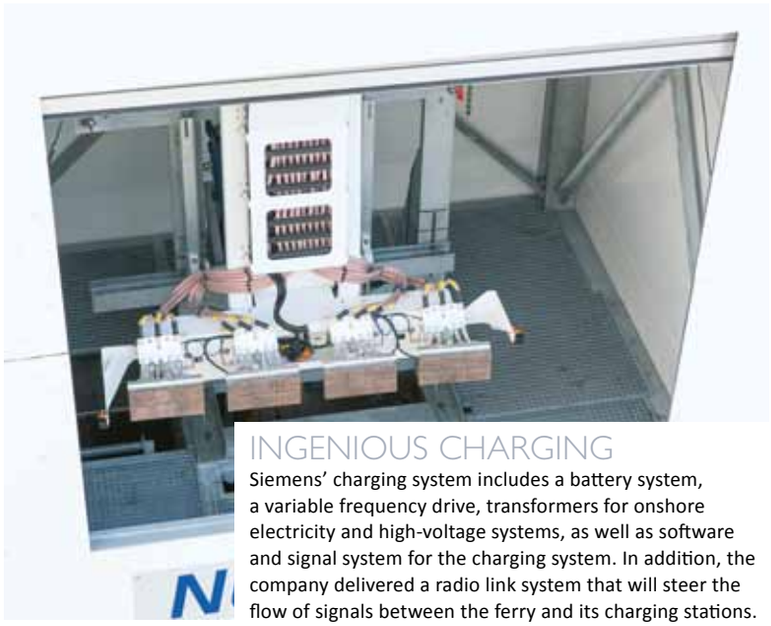
Photo Courtesy of www.siemens.com/press

SEAMLESS OPERATION

The ship's genset, switchboard, propulsion and thruster control systems are fully integrated to ensure seamless ship operation.

34 TIMES A DAY

The fully electric ferry operates across the 6km long route E39, between Lavik and Oppedal, north of Bergen in Norway. It travels the impressive Sognefjord 34 times a day, with each trip taking around 20 minutes.



INGENIOUS CHARGING

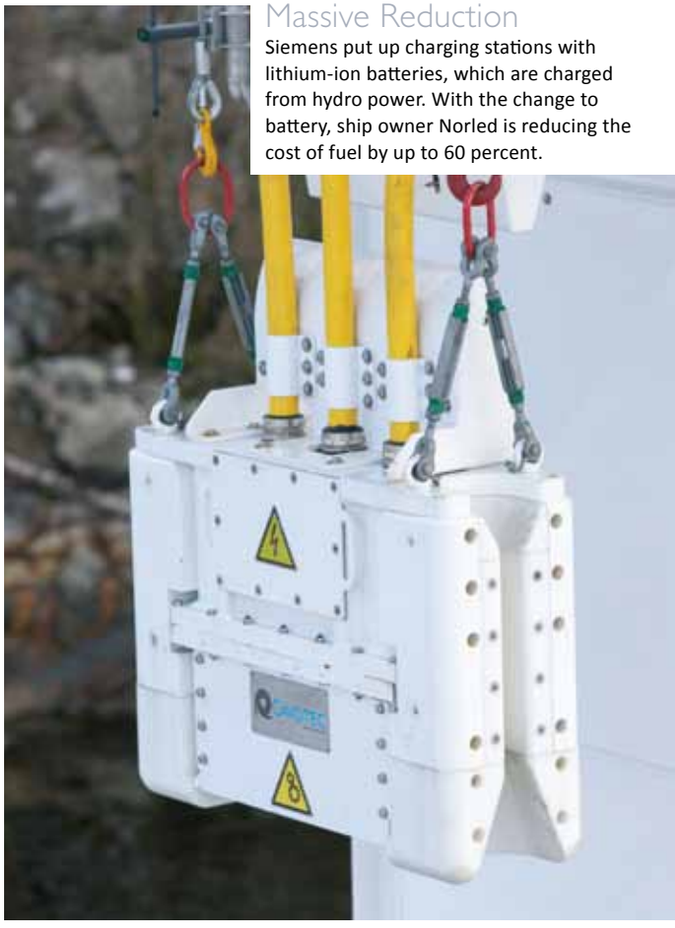
Siemens' charging system includes a battery system, a variable frequency drive, transformers for onshore electricity and high-voltage systems, as well as software and signal system for the charging system. In addition, the company delivered a radio link system that will steer the flow of signals between the ferry and its charging stations.

RECHARGING IN THE HARBOUR

Charging stations are housed in small buildings about the size of newsstands.

Massive Reduction

Siemens put up charging stations with lithium-ion batteries, which are charged from hydro power. With the change to battery, ship owner Norled is reducing the cost of fuel by up to 60 percent.



SIEMENS SOLUTION

Because the power grid in Oppedal and Lavik is not dimensioned for this kind of charging system, Siemens came up with the solutions of installing three battery packs: one on board the ferry, and one on each shore side. The battery packs on shore are charged continuously and transferred to the ferry when at pier.

Half as Heavy

With its 80m length and 20m width, the Ampere transports up to 120 cars and 360 passengers. It is made exclusively of light aluminum making it only half as heavy as a conventional ferry.

i. www.norled.no
i. www.siemens.com
i. www.fjellstrand.no