SEAM

Smarter. Cleaner. Brighter.

We develop **Smarter** solutions, for a **Cleaner** and **Brighter** future.

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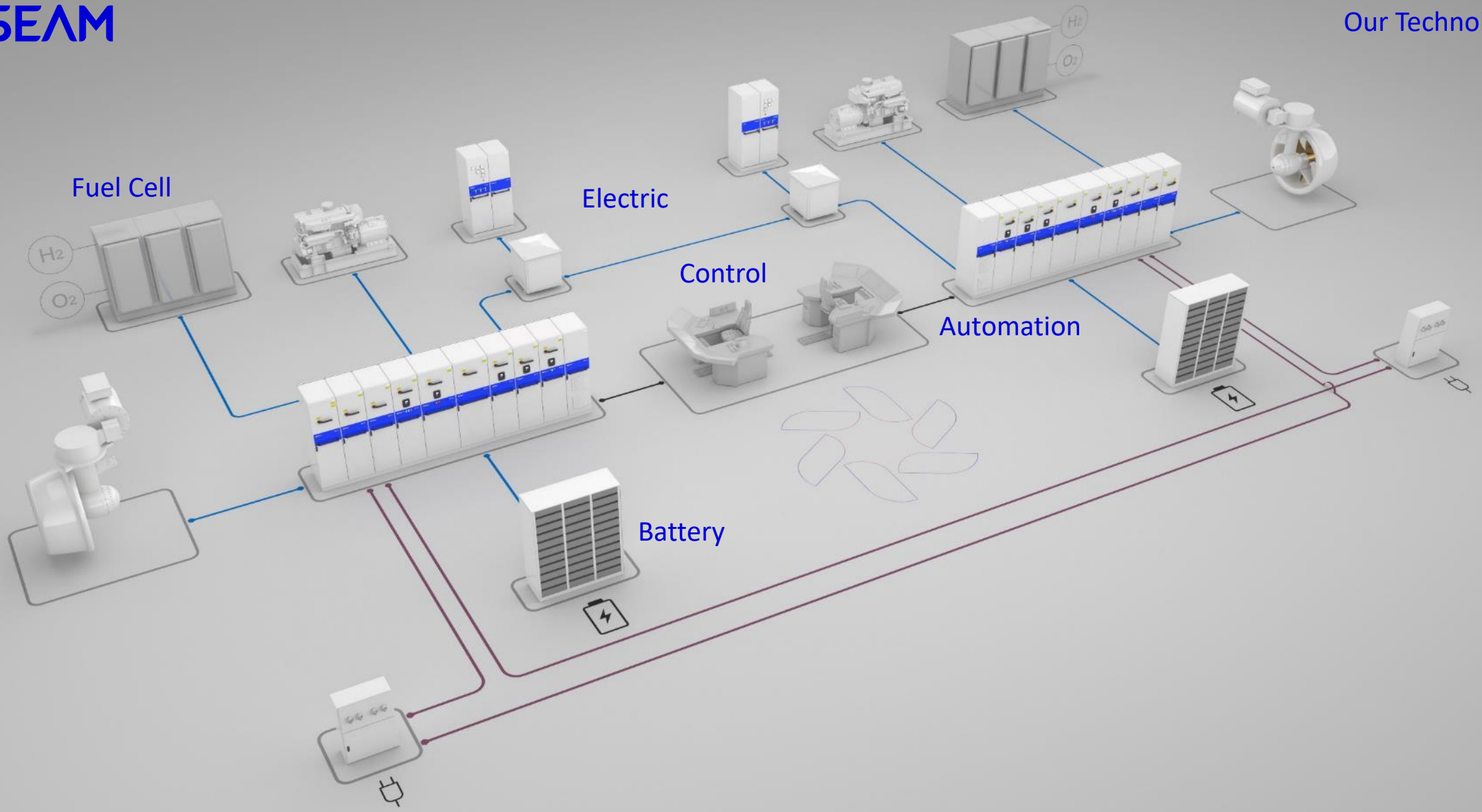


Seamless **integration** of Power, Automation and Control

Technology is here now

Battery, hydrogen and hybrid electric vessels

World's first:

PSV with battery power

2015

Fully electric high-speed passenger vessel

2023

long-distance hydrogen ferries

fully electric and emission-free catamaran

ferry operating on hydrogen

tug with ammonia cracking technology

How to decide what to choose?

biodiesel
hfo
lpg
hydrogen
biogas
lng
mdo
mgo
ammonia
methanol

ICE - Generator

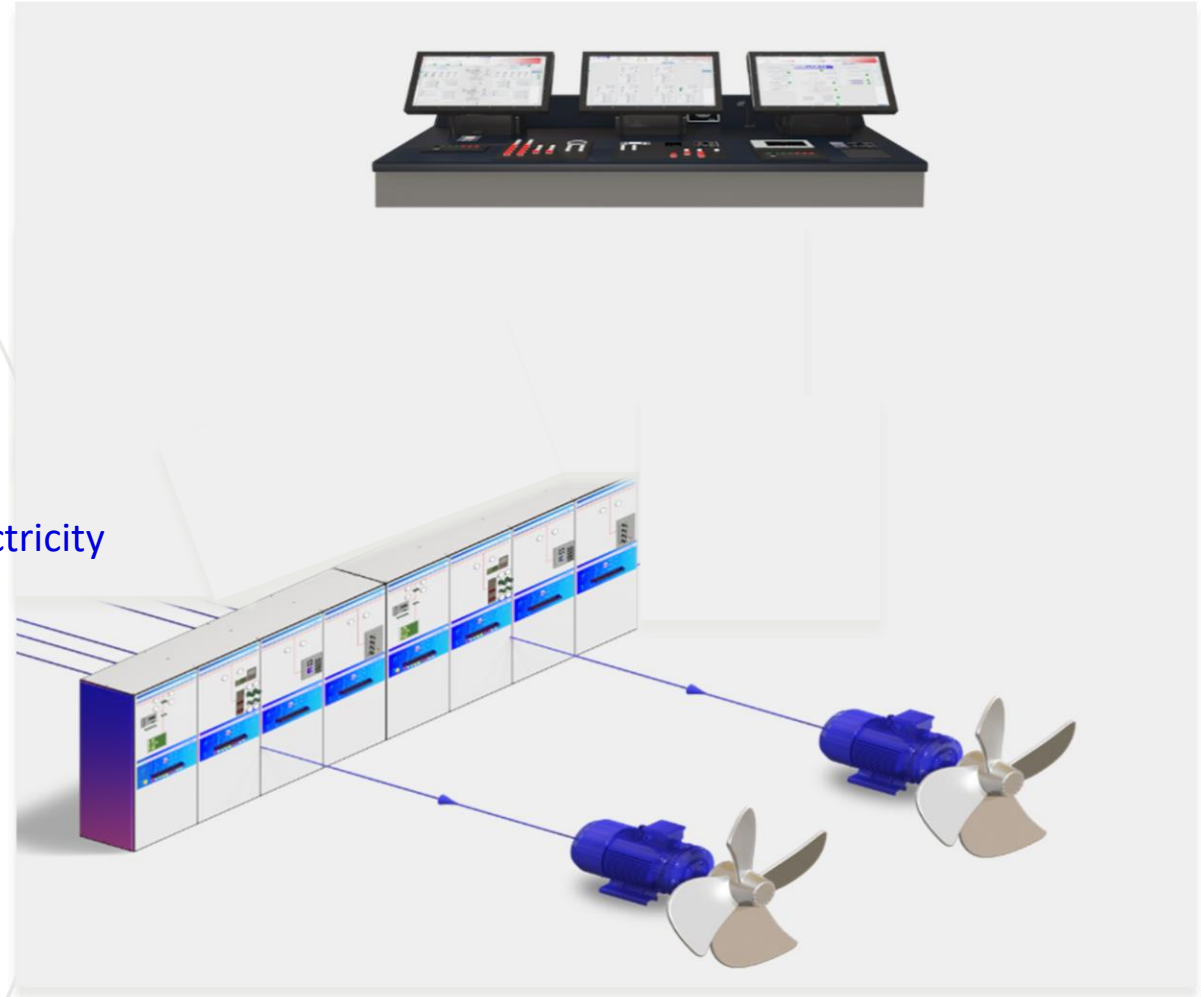
hydrogen

Fuel Cell

battery

Battery

Electricity



e-SEAMatic® Bunkering Process Control & Bunkering Shut Down – User and Operation Manual

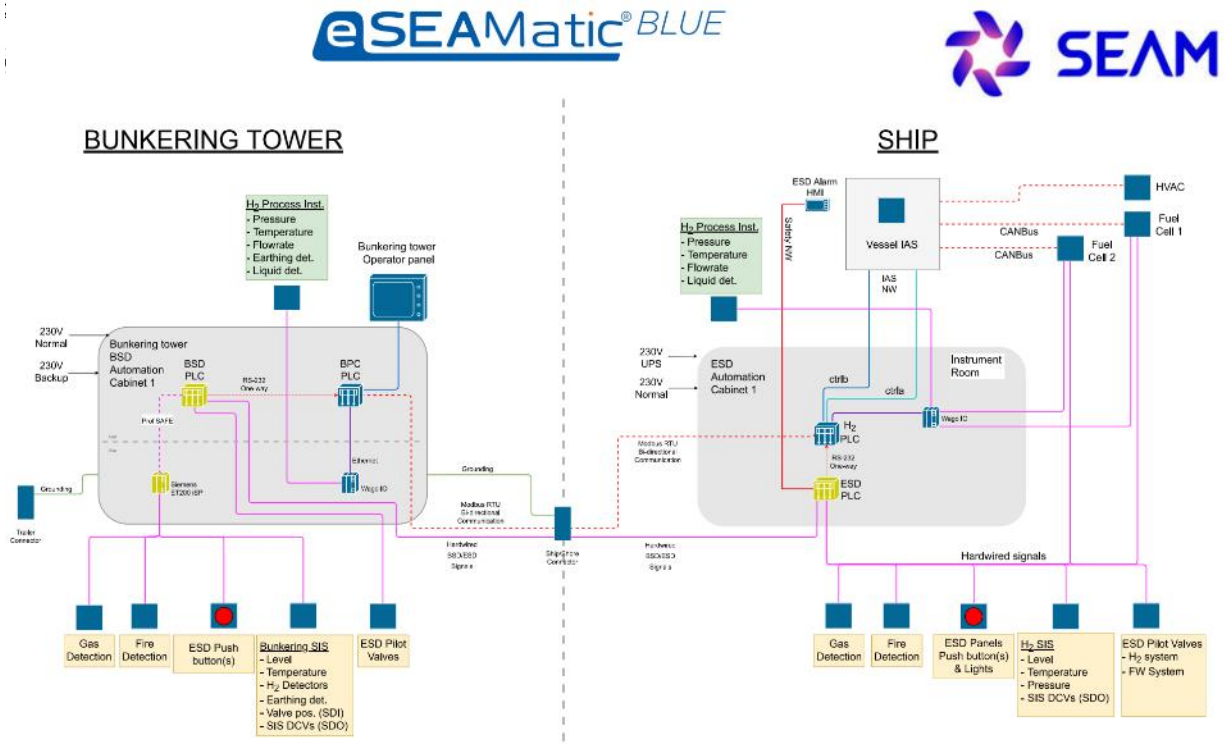
LMG-80-DEH2 Hydra
Yard No. 38
Norled

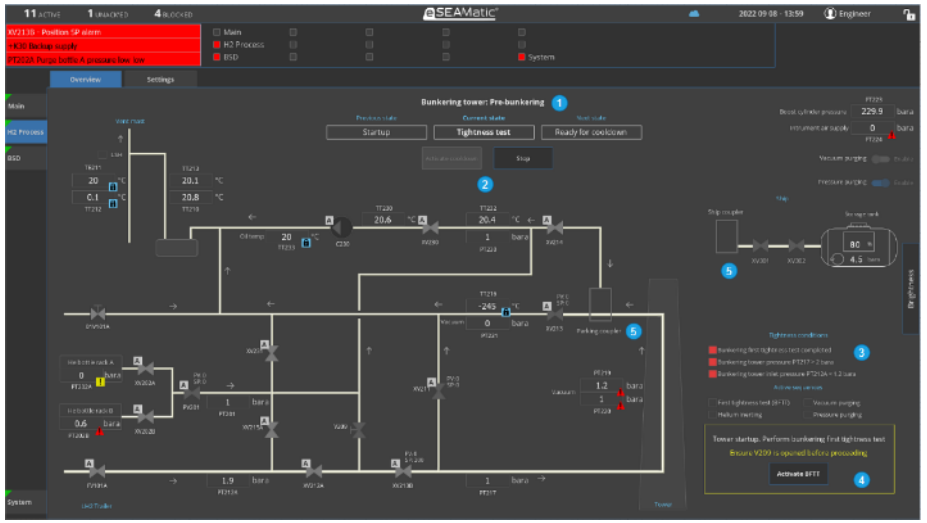
Hydrogen Projects

MF HYDRA

Integrated Automation & Control System
Energy & Power Management System
Hydrogen Automation & Control System

- Hydrogen Emergency & Shutdown System
- Hydrogen Bunkering Process Control System





TORGHATTEN NORD

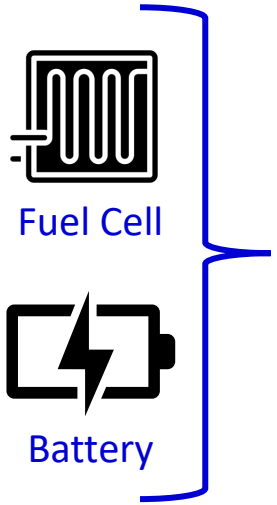
2 x long-distance hydrogen ferries, for Norway's longest state ferry connection.

- Compressed hydrogen storage
  - More frequent bunkering than LH_2
  - Demands more space than LH_2
  - Less expensive than LH_2
- Hydrogen safety and control systems
- Energy & Power Management System
- 6,4 MW Fuel cells (PowerCell)
- Battery system
- e-SEAMatic® IAS
- e-SEAMatic® EPMS

VeerGroup: Veer.Voyage

- The challenge onshore is availability of hydrogen and stadardized storage and bunkering of hydrogen

Hydrogen
- Liquid or
- Compressed



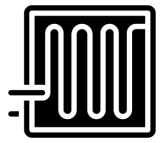
Electricity

- The challenge onboard is mainly solved: Power, automation, safety and control of hydrogen fuel cell plants is proven

WahKwongMaritimeTransportHoldings Limited

- The challenge onshore is availability of hydrogen and stadardized storage and bunkering of hydrogen
- The challenge of huge energy demand and hydrogen storage onbard is the large size (and shape) of the tank

Hydrogen
- Liquid or
- Compressed



Fuel Cell

Battery

Electricity

- The challenge onboard is mainly solved: Power, automation, safety and control of hydrogen fuel cell plants is proven
- The challenge of 10 to 12 MW Fuel Cell power is solvable

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