Stena Electric Ship

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THIS IS STENA AB

A family owned group of companies

REVENUE MSEK
36,417

ACTIVITIES ALL OVER
THE WORLD

15,000[1)]
EMPLOYEES

173[2)]
VESSELS INCLUDING NEWBUILDINGS

26,400[3)]
RESIDENTIAL AND COMMERCIAL UNITS

96
WIND TURBINES

1) Including seagoing personnel
2) Owned, chartered and managed
3) Owned and managed

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Stena Teknik

Providing maritime technology expertise to the Stena Sphere

Newbuilding project process

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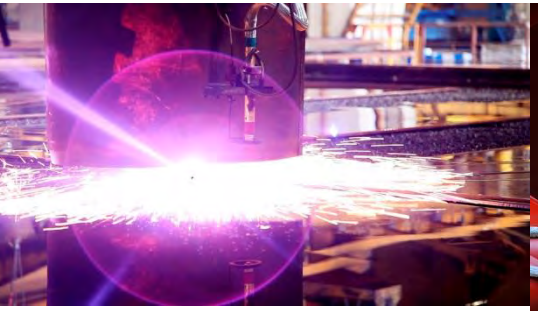
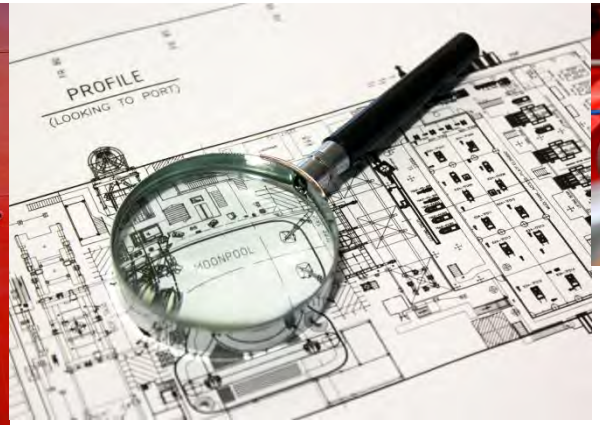
Stena’s newbuilding history –Last 20 years





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Stena newbuilding history - High Speed Service vessels

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Stena Newbuilding history - RoRo and RoPax ships

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Stena newbuilding history - Offshore Drilling vessels

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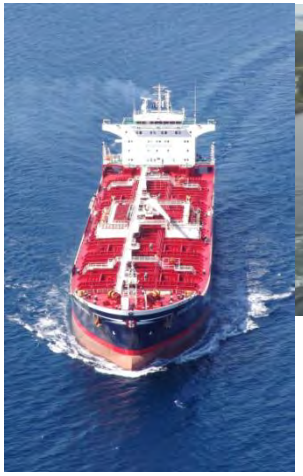
Stena newbuilding history - Tankers



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Current newbuilding projects

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Fuels for the Future

Muscles | Wind | Coal | Oil |

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Fuels for the Future

Our view is that we have to face a fuel mosaic as different ship types need different solutions.

- In a 10-15 year perspective **HFO with scrubber**
- **LNG** for new built ships in certain areas
- **Methanol/Ethanol** can be looked upon as a step towards fossil free shipping.
- **Battery** powered ships will be an attractive alternative for distances less than 100nm (6 hrs)
- In a longer perspective **bio fuels** and fuel cells will enter the market

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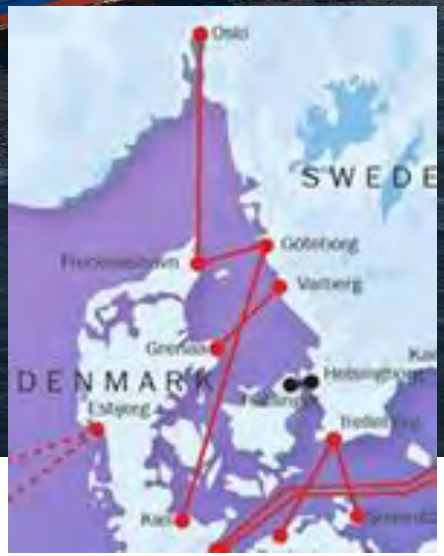
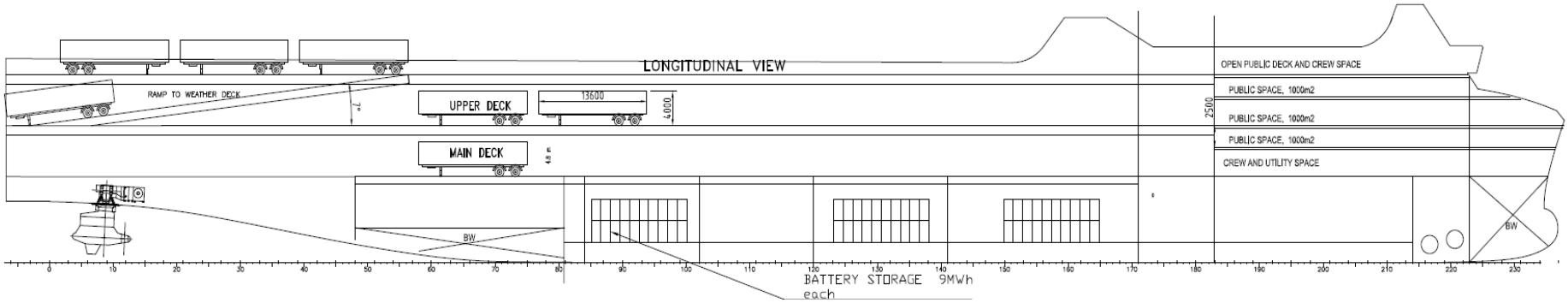
Stena Elekta –All electric RoPax

- **Why?**



Stena Rederi

- No engine room
- Smaller crew and less maintanance
- No oil fuel handling. Weight of fuel equals batteries
- Required battery capacity 20 MWh
- Mobile generator set for transit voyages with reduced speed

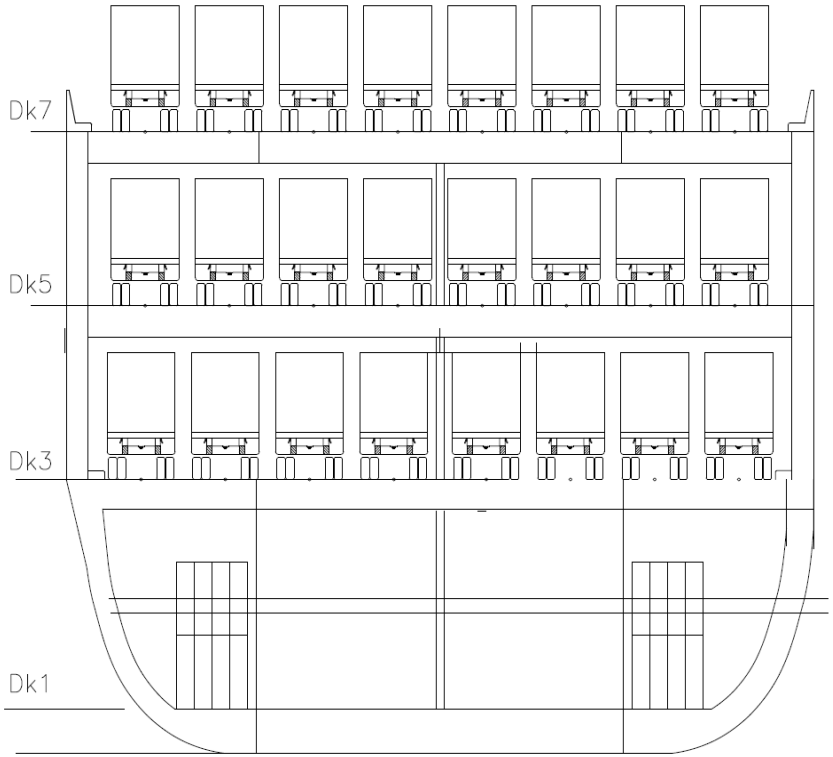


200 lorries and approx. 400 passengers

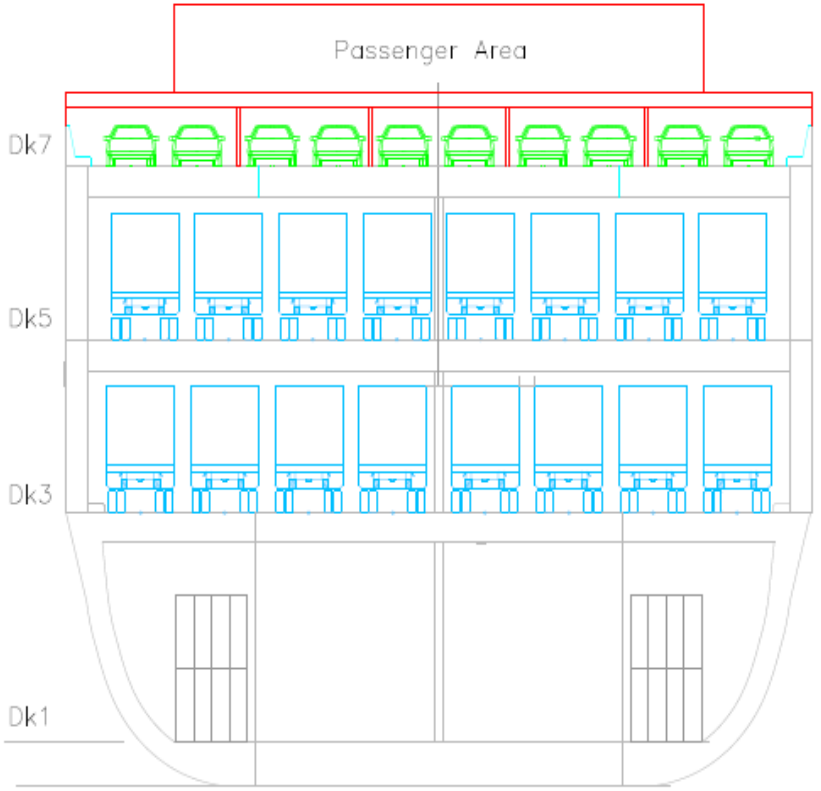
Stena Rederi

Flexible passenger capacity

”winter mode”



”summer mode”



Stena Rederi

- Low weight is essential to save on the electric power storage
- Purpose built for a specific route to save weight on unneccesary equipment
- Only stern loading enables a more efficient hull form

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Light weight focus on material and design

- **High tensile steel for the hull**
- **Aluminium or FRP for fixed and removable accomodation space**
- **Reduced amount of equipment e.g. ramps, bow doors, life boats, E/R sub systems**

- **Challenge the Class Rules by adopting ”first principle” dimensioning based on actual loads**

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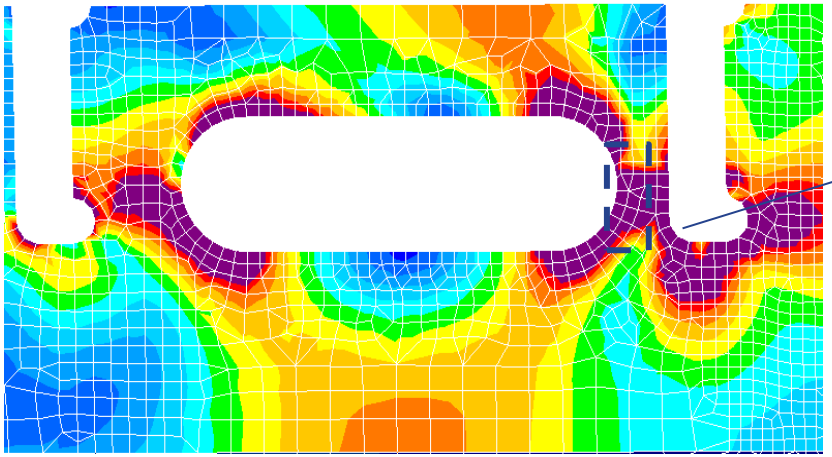
Non-linear analysis with cyclic loading can substantiate the strength redundancy with plastic deformation

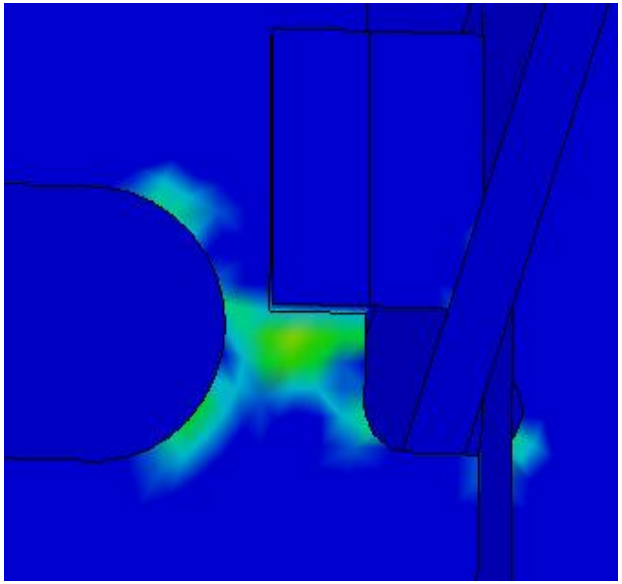
- Stresses around cut-out in deck web with increased deck load.
- Local stresses are above Yield limit

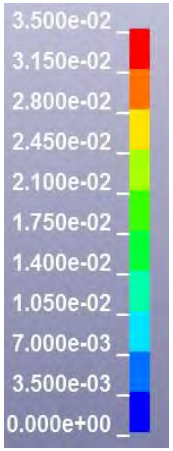


Average stress ≈295 Mpa
Is above yield limit

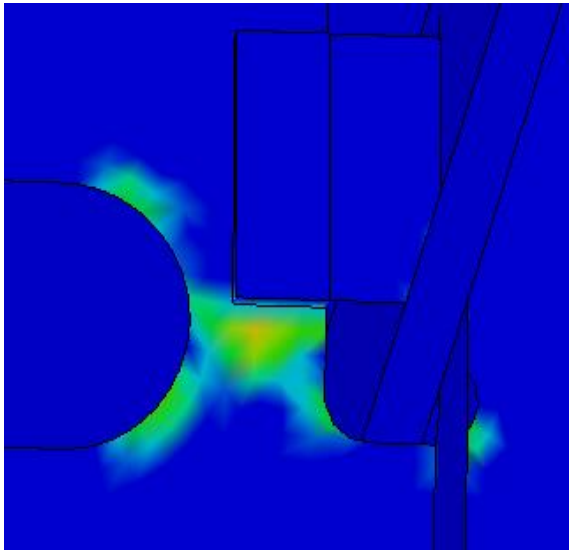
Stena Rederi

The plastic strain at the end of the 6:th loading cycle, 8.5s.





The plastic strain after the last loading cycle, 12s.



Result was approved by Class

Incentives and Barriers for electric drive

Driver:

- Reduced fuel cost
- More cost effective operation
- Greener environmental foot print

Barriers:

- High cost of batteries today
- Fast recharging of batteries during short port turn around

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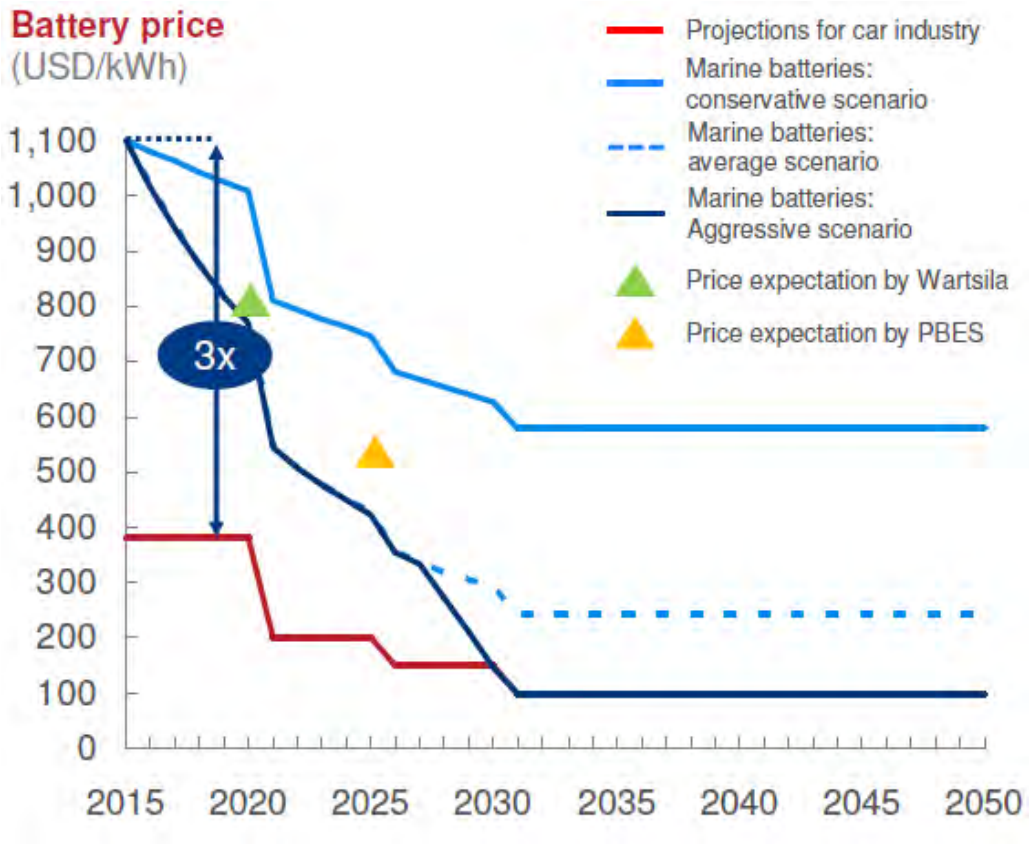
Fuels for the future – Battery price expectation



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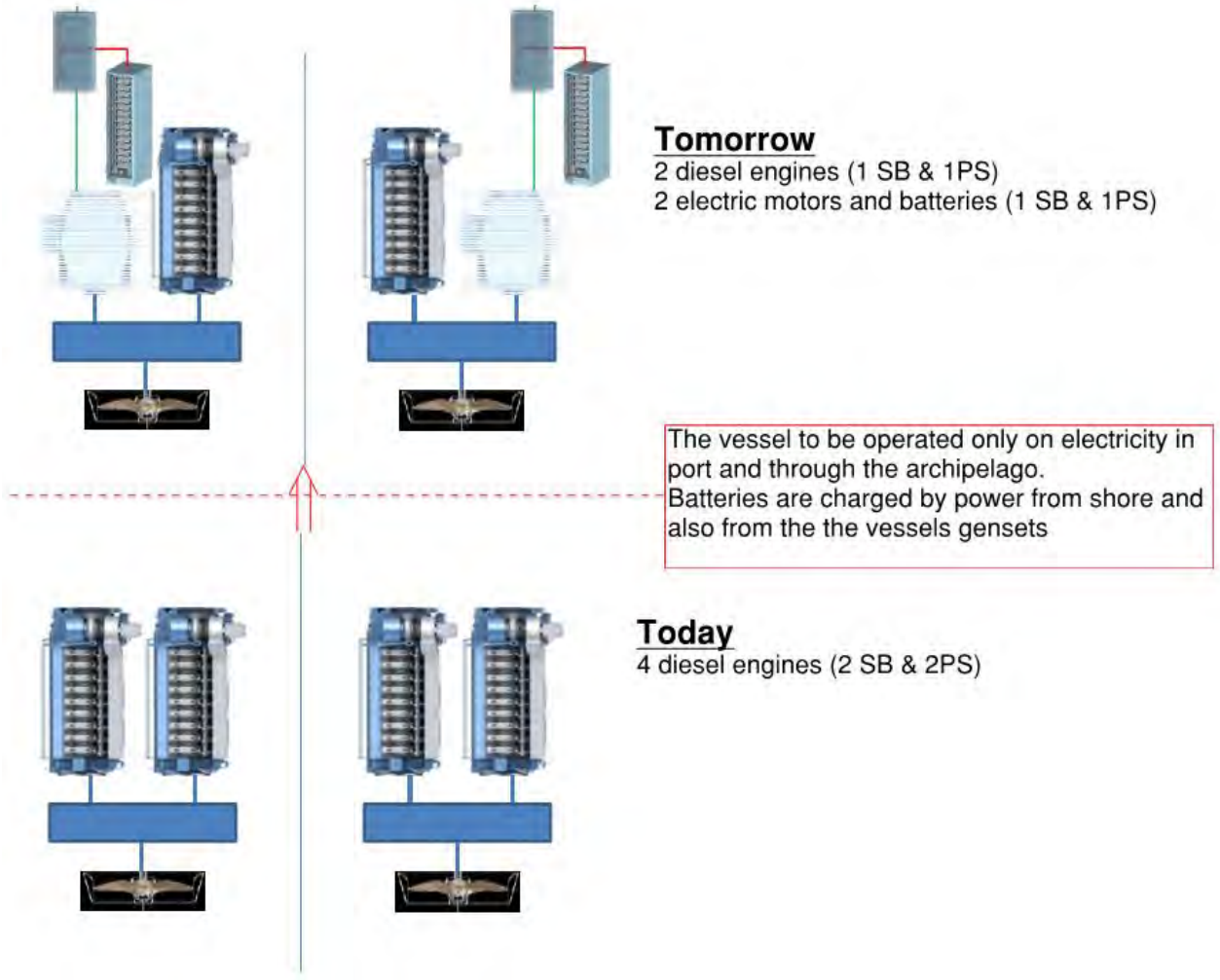
First Step – Replacement on two of the main engines on an existing ship



Tomorrow
2 diesel engines (1 SB & 1PS)
2 electric motors and batteries (1 SB & 1PS)

The vessel to be operated only on electricity in port and through the archipelago.
Batteries are charged by power from shore and also from the the vessels gensets

Today
4 diesel engines (2 SB & 2PS)

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Stena Elektra – A reality 2030!

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