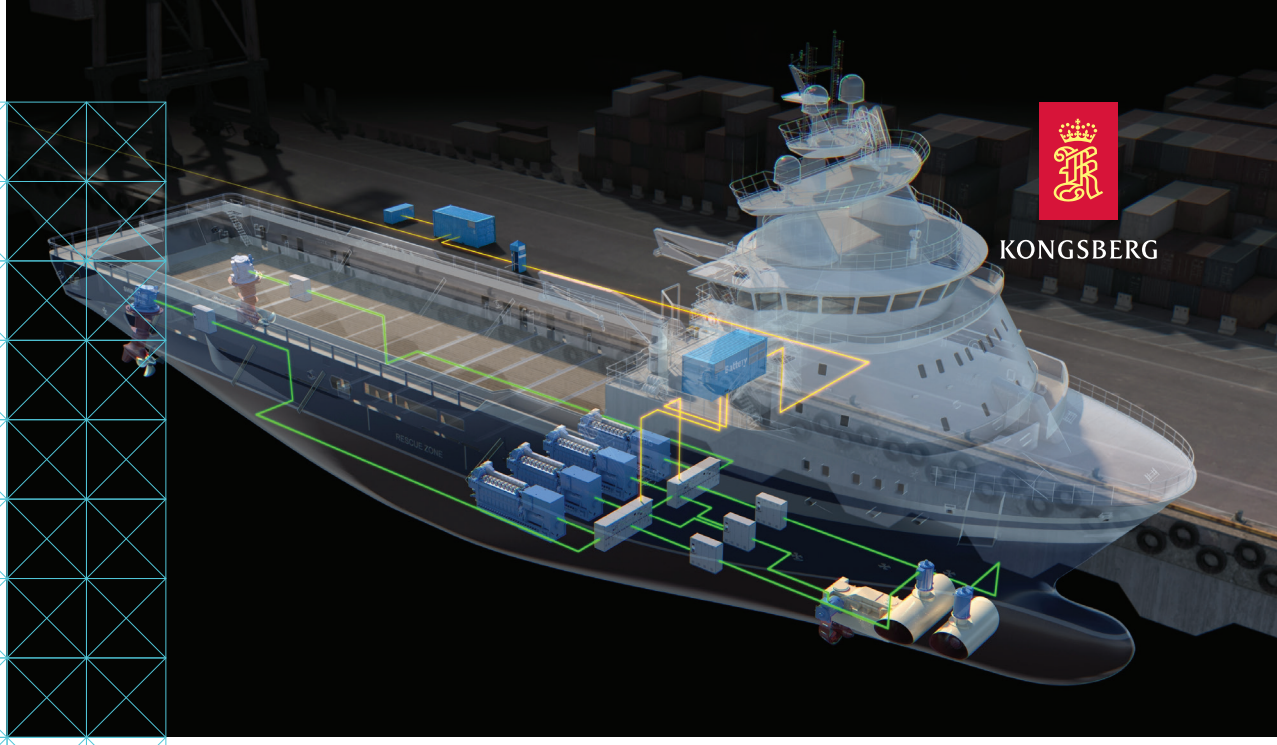
SHORE POWER



KONGSBERG

The demand for green solutions in the maritime industry is driving an increased use of clean electrical power systems that utilise shore connection. Kongsberg shore power is a flexible solution designed to be implemented in conventional power systems as well as complex power systems. It can easily be integrated with our power management system to achieve additional energy savings.

BENEFITS

Eliminate fuel consumption, emissions and lower maintenance cost with shore power

KONGSBERG ENERGY STORAGE SYSTEM

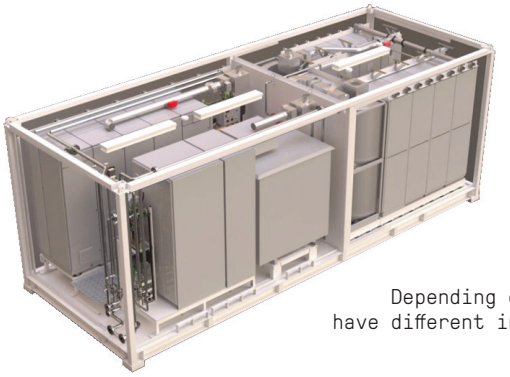
Shore power

About

Kongsberg Maritime offers solutions for shore power connection. The solutions will reduce fuel consumption and lower the maintenance cost of the gensets and therefore accommodate for the limits of emission and local harbor regulations

Kongsberg Maritime provides shore power solutions for safe and reliable power transfer from the onshore electric power grid to the vessel while in port. We have high focus on sustainable shore power solutions and all designs are according to IEC 80005-1 and IEC 80005-3.

In addition to delivery of shore power we can deliver optimized solutions for the vessels with a combined ESS and shore power for increased energy savings



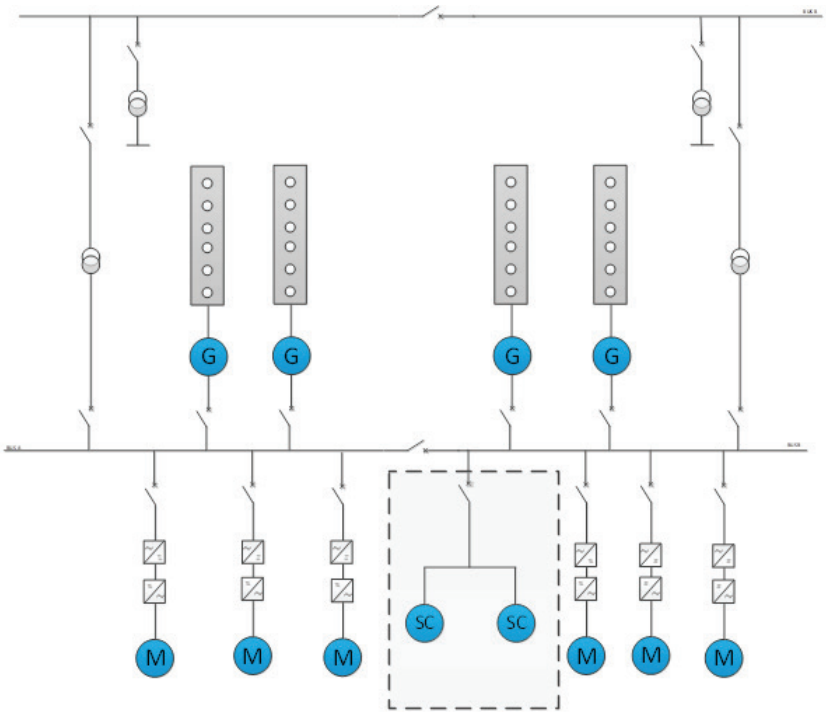
Depending on preferred solution we have different integration architectures

LV AC SHORE POWER CONNECTION

This solution will connect shore power to the vessel's AC switchboard.

The Low Voltage solution includes:

- Shore connection panel in switchboard
- Circuit breaker and required protections
- Control equipment and synchronizer
- IEC LVSC connector cabinet

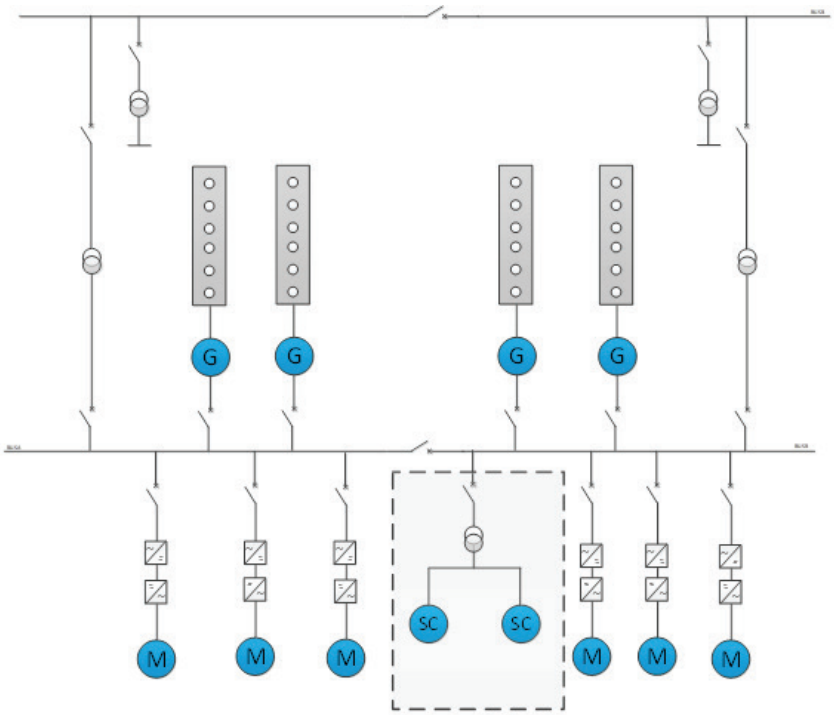


HV AC SHORE POWER CONNECTION

Our HV solutions offers the same functionality as our LV solution. The difference is that it requires an additional voltage transformation due to the difference between shore voltage and ship voltage.

The High Voltage solution includes:

- IEC HVSC connector cabinet
- HV SWBD sections
- HV/LV Transformer
- Incomer panel in LV switchboard
- LV Circuit breaker
- Required protections
- Control equipment and synchronizer



LV SHORE DRIVE UNIT POWER

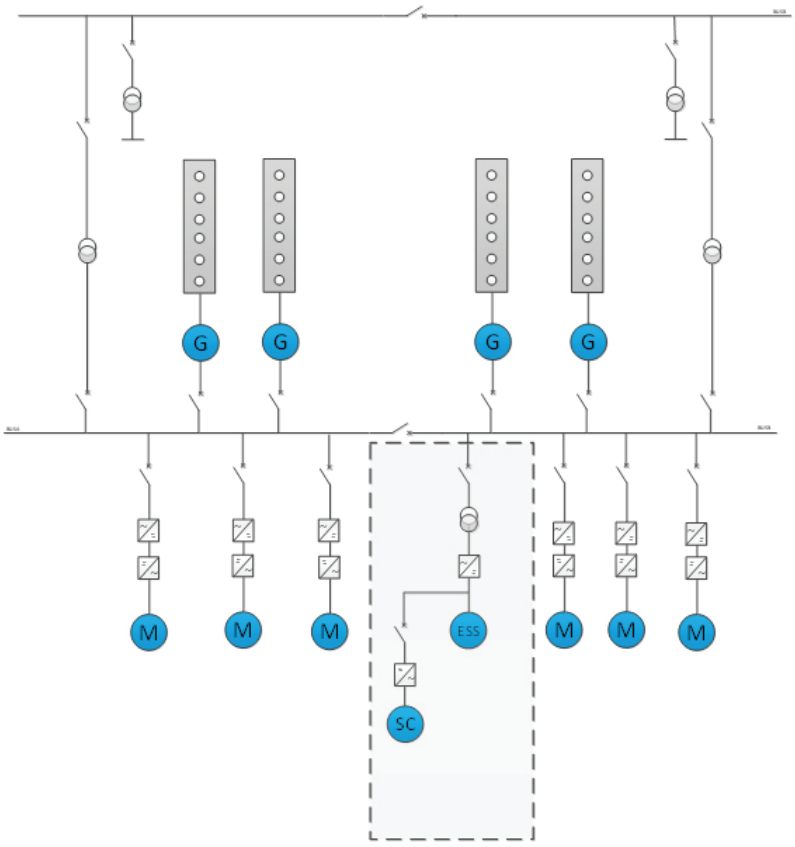
This solution will supply a fixed voltage and frequency to the vessel's LV AC switchboard regardless of the shore voltage and frequency utilizing a power converter.

With this solution the vessel can connect to any harbor if it offers a power connection point.

The Shore Drive Unit allows for change over to shore supply without blackout and the possibility to run onboard generators in parallel with the shore supply and optional onboard energy storage.

The LV Solution includes:

- Shore connection panel in switchboard
- Shore Drive Unit
- Transformer
- Control equipment, synchronizer and PMS interface
- Connection panel with automatic voltage selection
- IEC LVSC connector cabinet

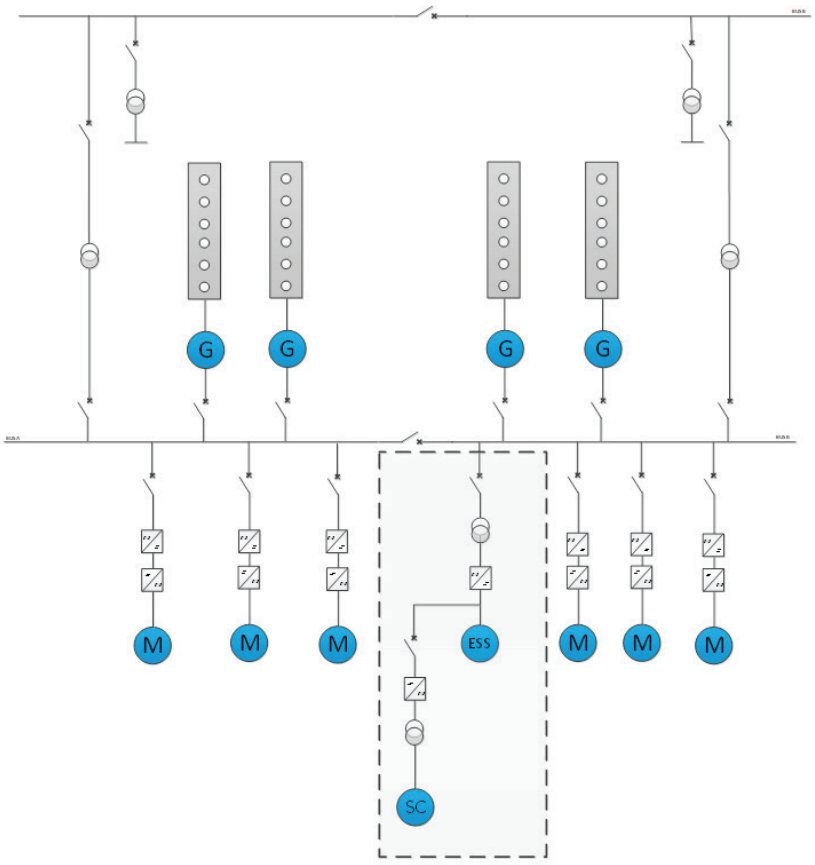


HV SHORE DRIVE UNIT POWER CONNECTION

Our HV solutions offers the same functionality as our LV solution. The difference is that it requires an additional voltage transformation due to the difference between shore voltage and ship voltage.

The HV Solution includes:

- IEC HVSC connector cabinet
- HV SWBD sections
- HV/LV 12P Transformer
- Shore Drive Unit
- Incomer panel in LV switchboard
- LV Circuit breaker
- Required protections
- Control equipment and synchronizer



Shore power connection systems

If required Kongsberg can deliver a variety of connection systems as a part of a shore power system delivery. This is based on products from well-known suppliers engineered to fit each installation. These systems vary in complexity and functionality, from simple cable dispensers onshore to fully automatic connection systems for fast charging of batteries.

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