

Electrical gensets

DC gensets can optimize vessel load, improving performance, reducing emissions and saving valuable onboard space

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Yacht and superyacht owners, as well as naval architects, are beginning to realize, and be confident with, new opportunities regarding the electrical systems on board yachts.

Traditional yacht design has, until now, been typified by the use of oversized AC generators. These types of systems create a number of challenges. For example, 1,500rpm for a 50Hz board network requires heavy engines, as they are limited at 50Hz. AC must be dimensioned for peak load (for

example, air-conditioning, hydraulics, bow thrusters and others) as it cannot be stored, and therefore needs to be produced and used immediately.

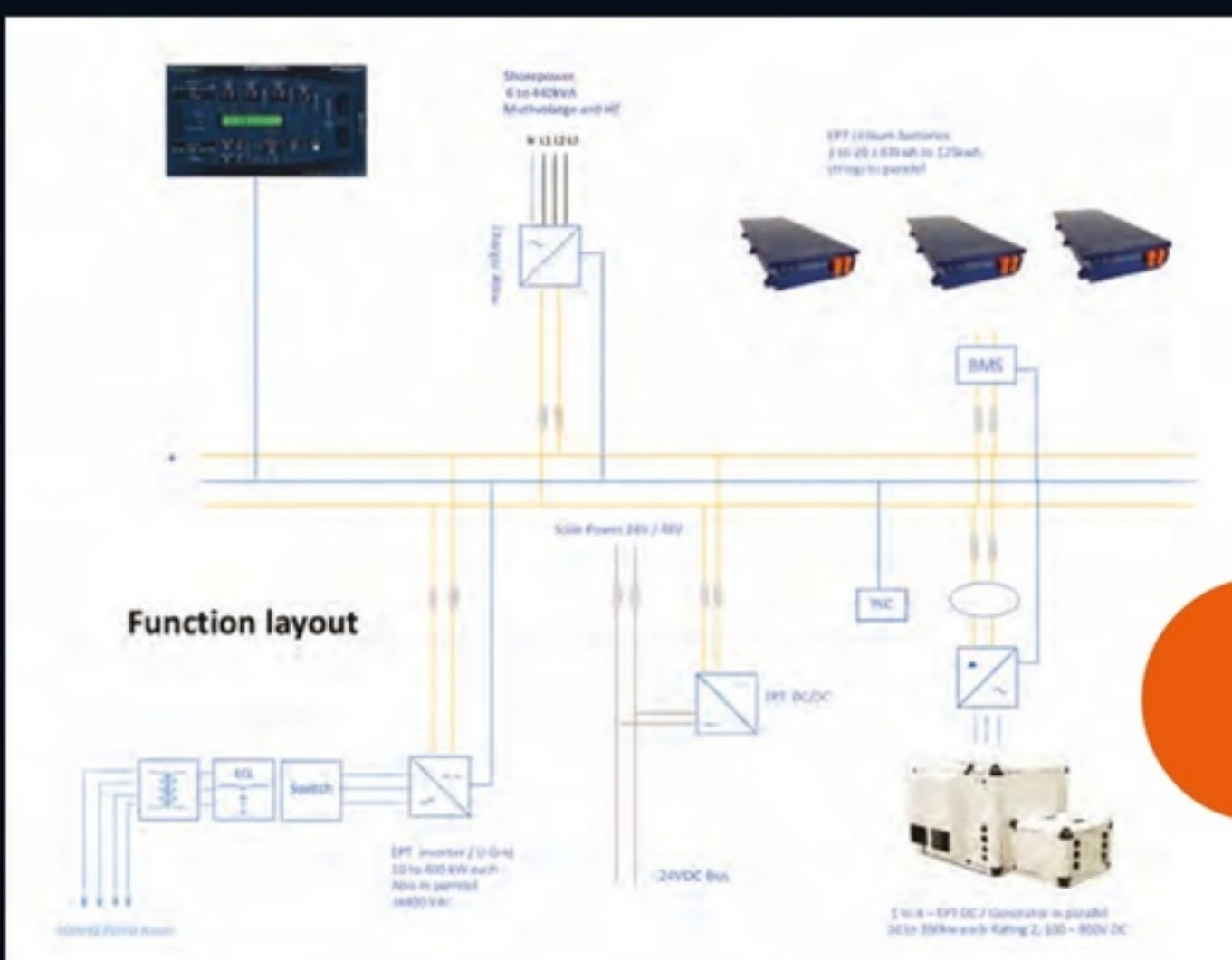
Efficient DC systems

The yacht would normally run at only 30-40% of peak load, and at night this could be as low as 20%. These are very inefficient fuel load points. Moreover, it creates soot in the exhaust, which clogs the DPF systems. An AC system is heavy, inefficient, polluting,

noisy, creates vibration and is maintenance-intensive as it runs 24/7. A standard 116kW AC genset 50Hz is around 1,544kg.

In comparison, the EPTechnologies' 150kW R2 variable-speed DC genset, 400V to 800V, weighs 700kg. This weight saving creates an opportunity for a 160kWh battery bank, and the EPTechnologies system has a 30% stronger genset. The DC genset is run at optimum settings and gas temperatures, optimizing exhaust emissions and fuel consumption. On an efficient system, the genset runs for a two-hour period twice a day, rather than constantly. This decreases the run time, noise levels, vibration and maintenance requirements. Large electric consumers are run over to the DC HV link (including air-conditioning, hydraulics, bow thrusters and others). The remaining consumers are served via inverters that are specified to be 50% stronger than the largest AC peak load. Inverters are small, cost-effective and easy to replace, and these can be installed in parallel.

Not using DC gensets on board yachts and superyachts simply doesn't make sense anymore. EPTechnologies can help customers perform an in-depth analysis on how they can refit or equip their vessel, bringing the onboard system to the next level. +



1. System schematic for optimizing vessel load

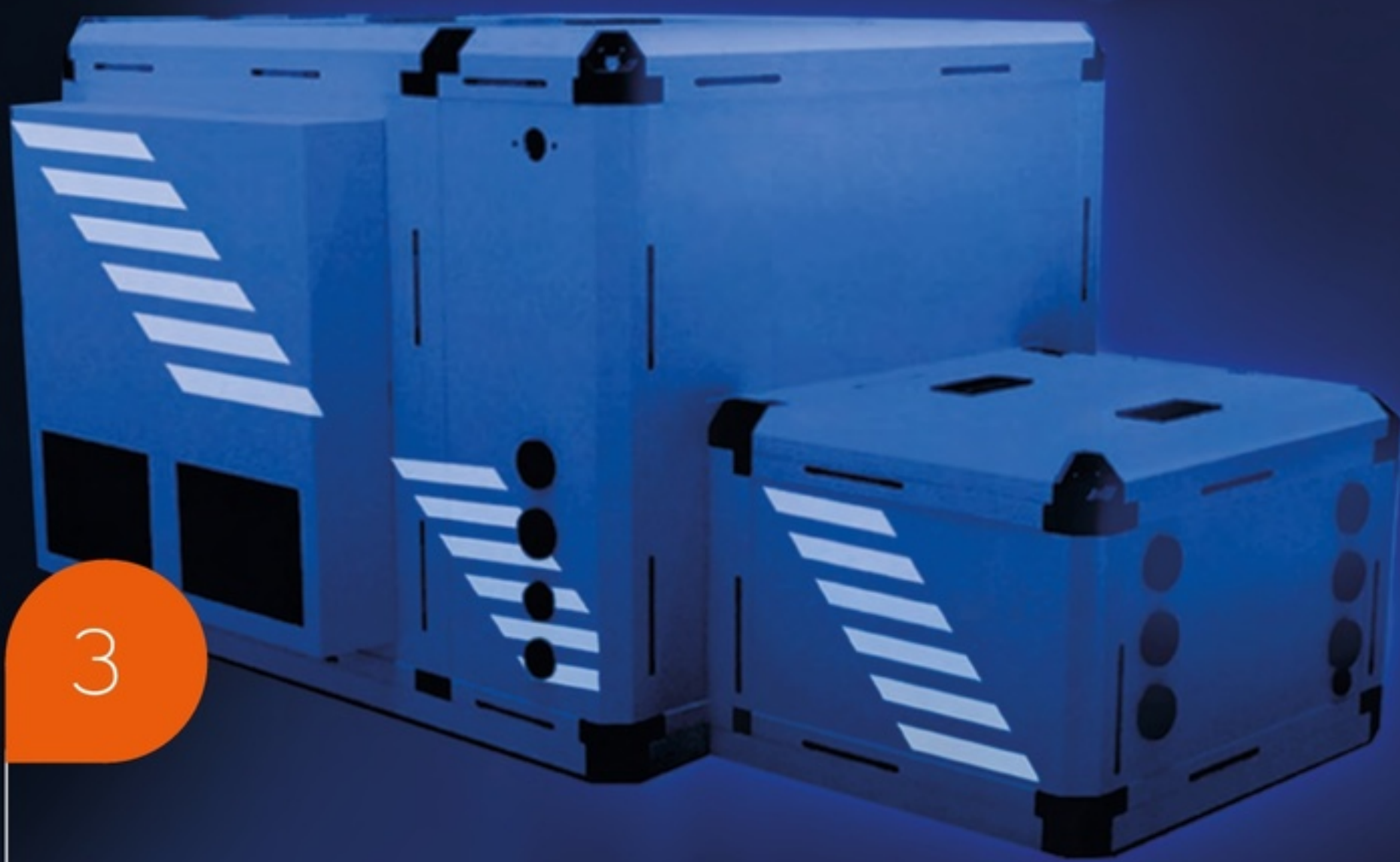
SILENT SAILING

ADVANTAGES: STANDARD AC GENSETS	ADVANTAGES: VARIABLE-SPEED DC GENSETS AND BATTERY
Proven technology	Lower fuel costs due to optimized setpoints
Standard maintenance	Less maintenance as not in 24/7 operation
Up-front price	In-service price
	Less noise and vibration
	Weight approximately 35% of equivalent AC genset
	Fewer side loads (ventilation, pumps and so on)
DISADVANTAGES: STANDARD AC GENSETS	DISADVANTAGES: VARIABLE-SPEED DC GENSETS AND BATTERY
Inefficient, fuel costs	Up-front price
Maintenance costs	Lesser known technology
Constant noise and vibration	
Side loads (such as ventilation)	
Rapidly aging system	
Heavy engines	

EPT D4 150kw variable speed DC Genset including sound enclosure



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2. A comparison of AC and variable DC genset systems
3. EPTechnologies' generator and battery setup