

**MARINE  
SOLUTIONS  
BY  
ZEPPELIN  
POWER  
SYSTEMS.**



**LET'S DO THE WORK.™**

**ZEPPELIN®**  
Power Systems 

**THE ZEPPELIN  
BRAND –  
A PIONEER  
SPIRIT WITH  
SUCCESS.**



# CONTENT

Zeppelin Power Systems is the official partner of Caterpillar for Cat and MaK engines and a leading provider of drive, propulsion, traction, and energy systems. We have developed this successful partnership over the course of 60 years.

Our company is part of the successful Zeppelin corporate group. With around 800 employees, we offer our customers individual and highly efficient system solutions as well as comprehensive services for industrial and marine applications, the oil and gas industry, rail vehicles, and power generation.

Today, the Zeppelin Group has a presence at 190 sites worldwide, with around 7,800 employees.

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# ZEPPELIN POWER SYSTEMS

## MARINE PORTFOLIO.

Our business activities cover sales and consulting, project planning, construction, customizing, commissioning and service for all drive system and energy applications that are based on Caterpillar engines and systems. This includes diesel, gas, and dual fuel engines from the Cat and MaK brand as main and auxiliary engines, emergency generators, propellers, thrusters, complete drive trains, and the corresponding systems.

Whether you use diesel-mechanical, diesel-electric, gas-electric, or even hybrid drive systems – we provide individual solutions from a one-stop shop, perfectly customized to your application.

With our own workshop at our Hamburg site, we have the added capability in the field of turbochargers. Repairs for Cat, Napier, KBB, KKK and other manufacturers' turbochargers are carried out here.

We partner with Optimarin for ballast water treatment systems and provide all services for the Optimarin Ballast System (OBS) in addition to sales.





Cat® diesel engines  
10–5,650 kW



Cat® gas engines  
400–1,620 kW



MaK dual fuel engines  
3,000–15,440 kW



MaK diesel engines  
1,020–16,800 kW



Berg Propulsion



Cat SCR systems



Optimarin Ballast  
System



## THE ZEPPELIN GROUP – WORLDWIDE SITES.

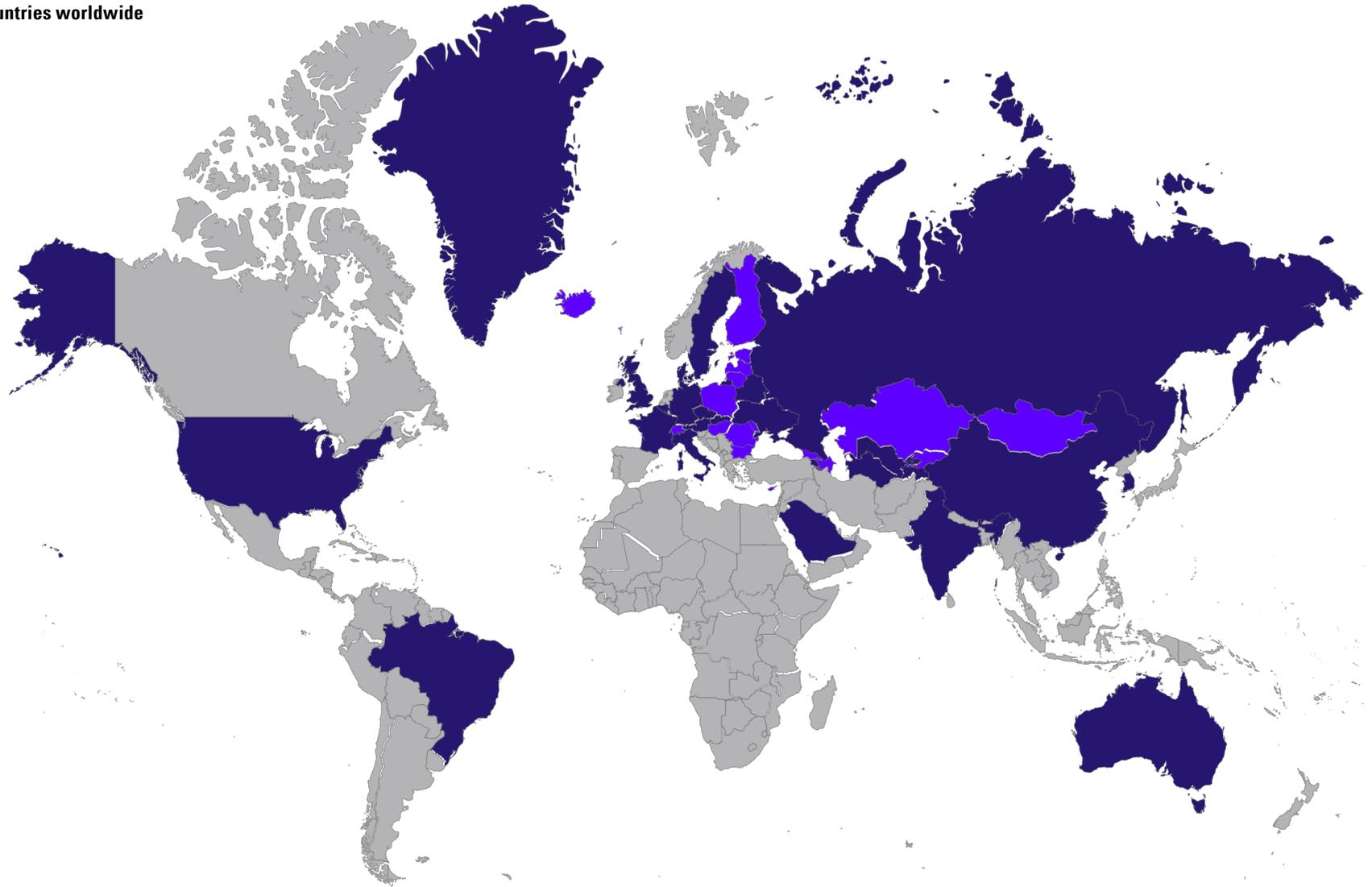
Our company is part of the successful Zeppelin corporate group.

Today, the Zeppelin Group has a presence at 190 sites worldwide, with around 7,800 employees. New international support points and branches are always emerging, helping us remain close to our customers.

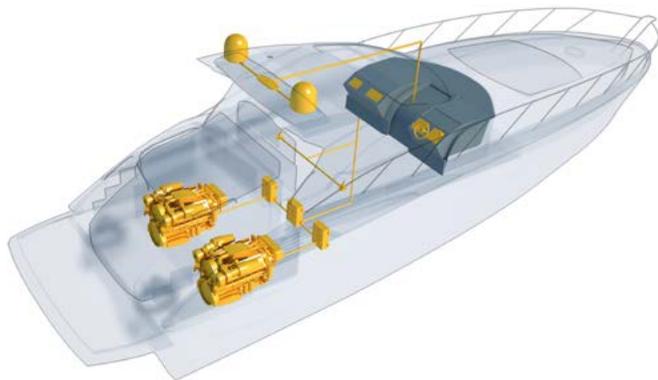
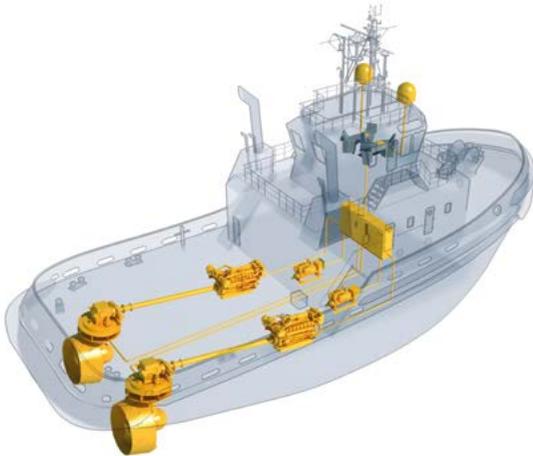
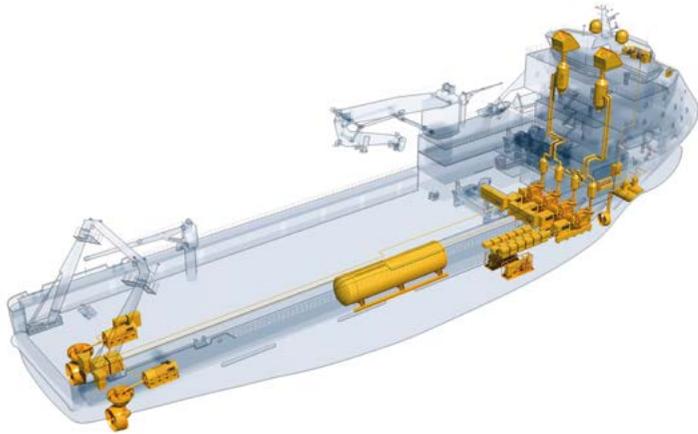
All Zeppelin sites with engine repair facilities enhance the Zeppelin network.

**Wherever our customers operate around the world, we are there.**

220 locations in 43 countries worldwide



- Armenia
  - Austria
  - Azerbaijan\*
  - Belarus
  - Belgium
  - Brazil
  - Bulgaria\*
  - China
  - Cyprus\*
  - Czech Republic
  - Denmark
  - Estonia\*
  - Faroe Island\*
  - Finland\*
  - France
  - Georgia\*
  - Germany
  - Great Britain
  - Greenland
  - Hungary\*
  - Iceland\*
  - India
  - Italy
  - Kazakhstan\*
  - Kyrgyzstan\*
  - Latvia\*
  - Lithuania\*
  - Moldova\*
  - Mongolia\*
  - Poland\*
  - Romania\*
  - Russia
  - Saudi Arabia
  - Singapore
  - Slovakia
  - South Korea
  - Sweden
  - Switzerland\*
  - Tajikistan
  - Turkmenistan
  - Ukraine
  - USA
  - Uzbekistan
- \*Distribution and service territory for MaK engines only.



## WE CREATE SOLUTIONS – ALL FROM ONE SOURCE.

We are your contact for complete system integration for your new build or retrofit projects. We provide you with all services, from main and auxiliary engines to propellers, bow thrusters, SCR and ballast water treatment systems and the integration of the whole LNG and control system.

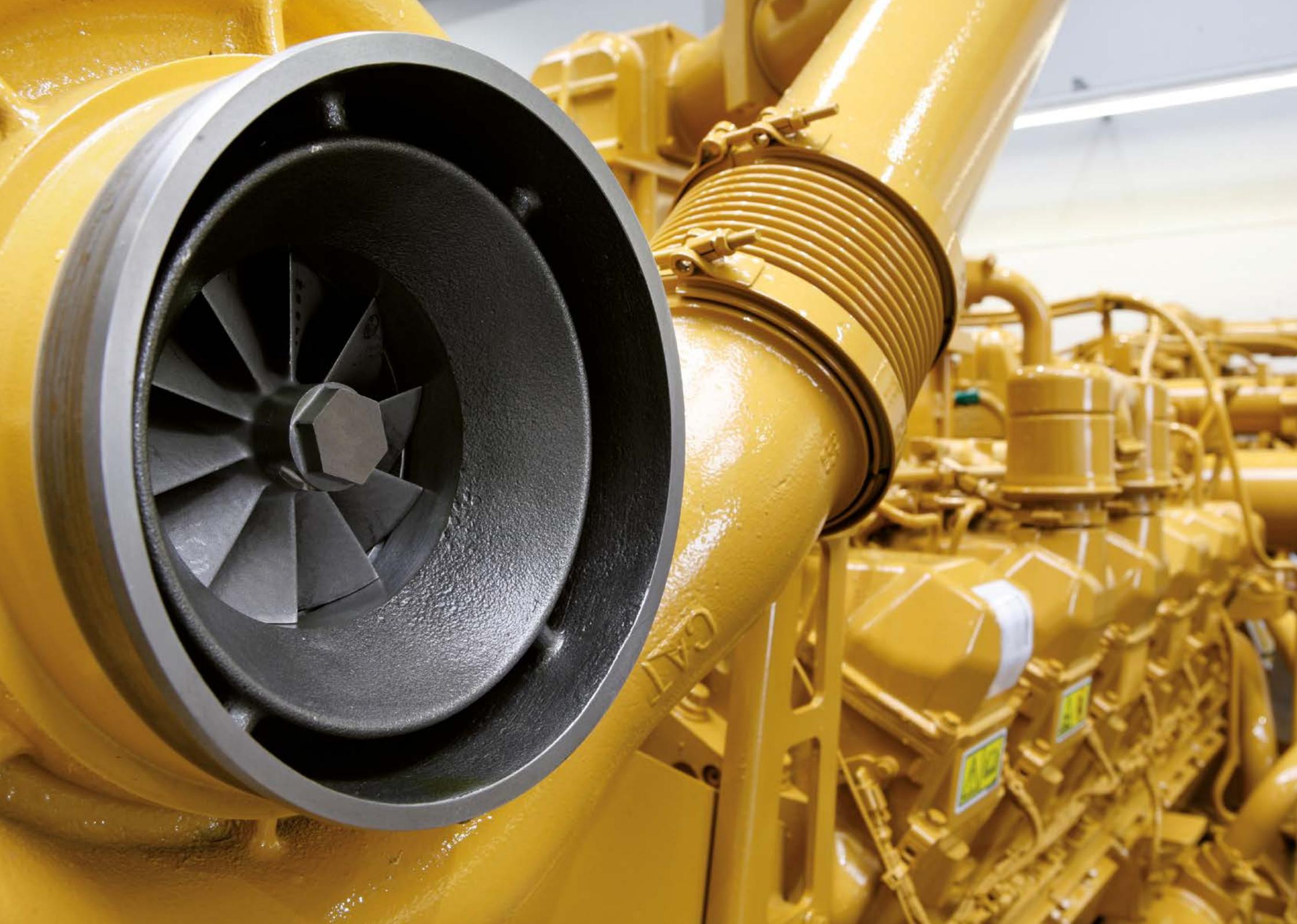
Following an in-depth consultation, you will receive customized ideas and the design and commissioning of your planned system all from one source, with our own construction in CAD design, state-of-the-art manufacturing sites and our own test beds.

The product portfolio includes the engine brands **Cat, MaK, Berg Propulsion propeller and control systems, and the Optimarin Ballast System.**

From planning to commissioning, we are at your side with our comprehensive worldwide service. Wherever you are – we're here for you!

Based on your specific project we are able to offer different financing options.

**What can we do today to support your business?**





# CAT ENGINES – RELIABILITY FOR ALL MARINE SEGMENTS.

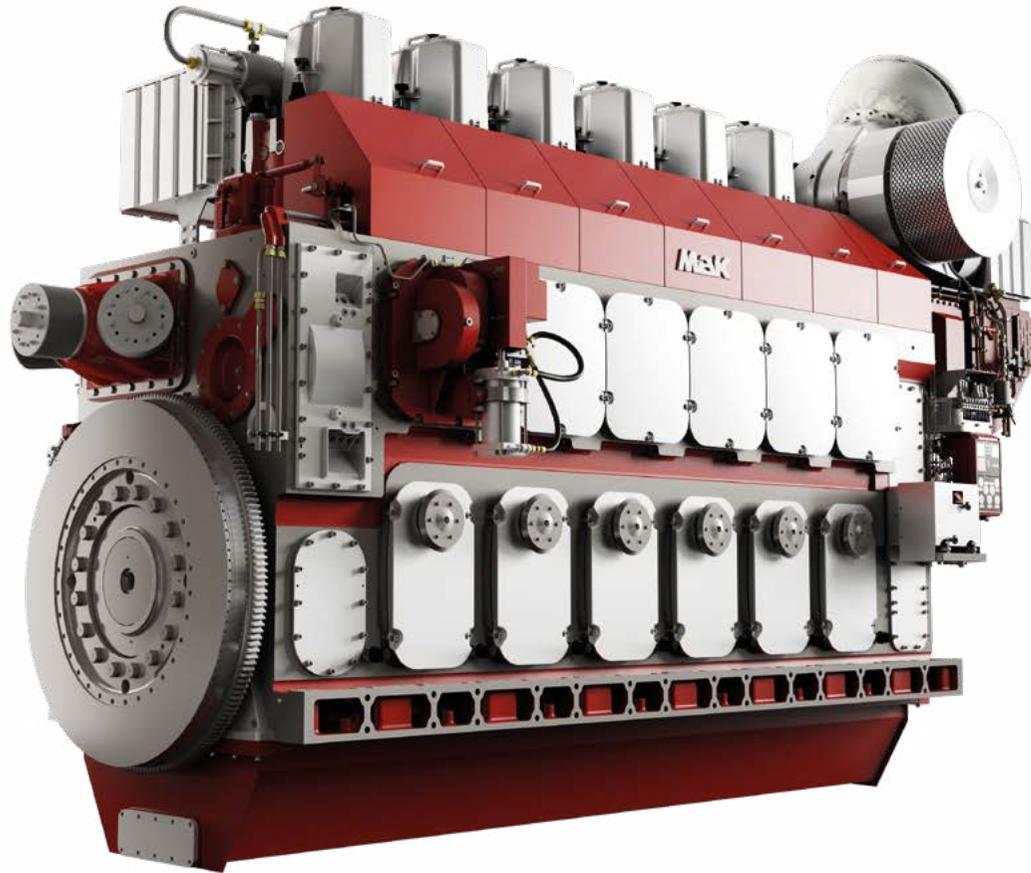
Caterpillar offers a complete range of conventional and electronic propulsion solutions spanning across commercial and leisure applications. With power ranging from 10 kW to 5,645 kW, Caterpillar has the right high-speed or medium-speed propulsion solution for you.

Whatever the application, and whatever the solution, Cat products are renowned not only for their reliability, durability and efficiency, but also for their design and manufacturing innovation.

They deliver the advanced control that vessel operators need to maximize power and efficiency as well as the enhanced monitoring that ensures peace of mind.

By leveraging the ACERT™ and Cat Common Rail technologies, Cat electronic engines are designed to meet every global emission standard.





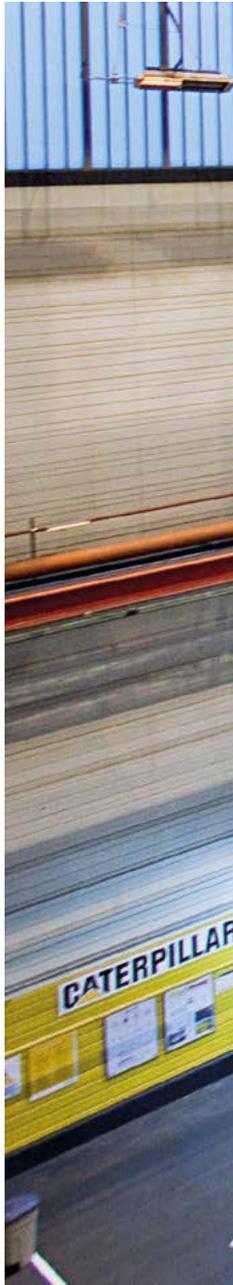
## MaK ENGINES – PERFORMANCE OF UP TO 16.8 MW.

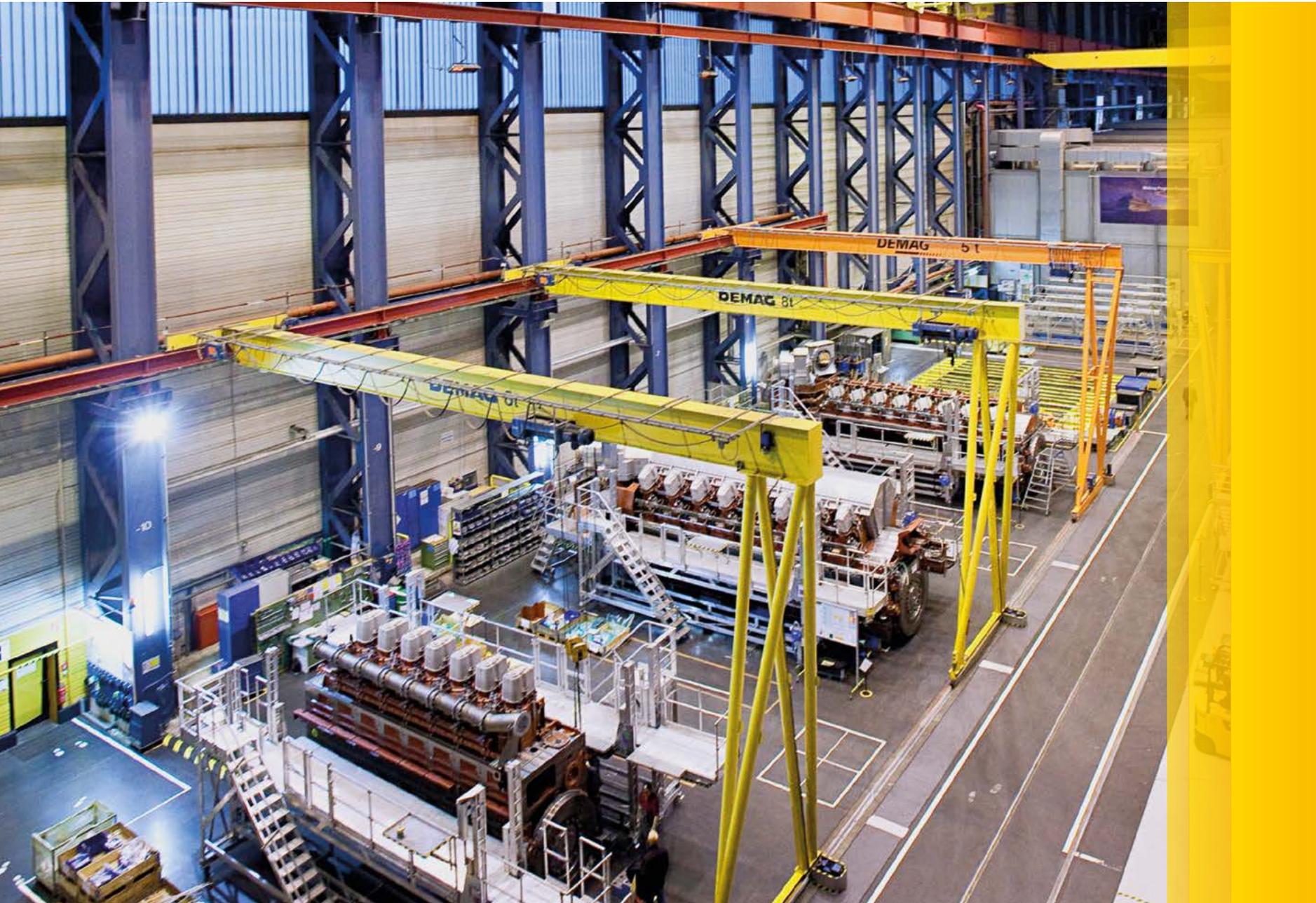
Caterpillar Motoren GmbH & Co. KG and the excellent reputation of the MaK brand are based on more than 90 years of experience in the development, manufacture, and service of gas, diesel, and dual fuel engines.

The current MaK product line, comprising six medium-speed, four-stroke diesel and dual fuel engine models, ranges in power from 1,020 to 16,800 kW. MaK engines feature an extremely high level of reliability, low operating costs and simple installation and maintenance, and they meet current and future engine exhaust emission standards.

MaK engines can be operated by economical heavy fuel oil (HFO), and meet NO<sub>x</sub> limits according to IMO Code Revised MARPOL, Annex VI, NO<sub>x</sub> Technical Code 2008, (IMO Tier II).

Operated with heavy fuel oil, marine diesel, gas or dual fuel MaK engines are available in a power range of 1,020 kW to 16,800 kW.







# EXHAUST GAS AFTERTREATMENT – CAT<sup>®</sup> SCR SYSTEM.

Governments are already incentivizing shipowners who invest in NOx emissions-reducing technologies. The Cat SCR System solution was designed by Caterpillar to meet future IMO III emissions requirements. Installation and operation of the Cat SCR System is a sustainable solution to reduce NOx emissions without sacrificing the typical marine engine efficiency, durability and reliability that our customers are used to.

The service- and maintenance-friendly design, remote condition monitoring and diagnostic capabilities as well as the unmatched global product support respond to the industry's desire to lower operational costs and downtime beyond today's standards.

Cat SCR Systems are available for Cat and MaK engines.

Retrofit solutions are also available upon request.



# PROPELLER AND CONTROL SYSTEMS – FROM BERG PROPULSION.

The products from Berg Propulsion expand the portfolio with solutions for propellers, thrusters and control systems. With this, we provide full marine propulsion systems from one source.

Zeppelin Power Systems has been awarded with the highest level of recognition by Berg Propulsion for the sales of propulsion equipment.



## **Marine Propulsion Propeller, MPP**

Berg Propulsion controllable-pitch propellers are available for high-power applications with and without nozzle, with a diameter of up to 8.50 meters, and for power outputs of up to 20 MW.

The patented feathering mode improves operational flexibility and efficiency in ships with twin propeller systems. In feathering mode, the blades run parallel to the current, minimizing resistance and reducing operating costs.



## **Marine Thruster Azimuth, MTA**

The systems are available with horizontal or vertical drive. The fixed-pitch or controllable-pitch propeller systems have a diameter of up to 3.40 meters, and are available for power outputs of up to 4 MW.



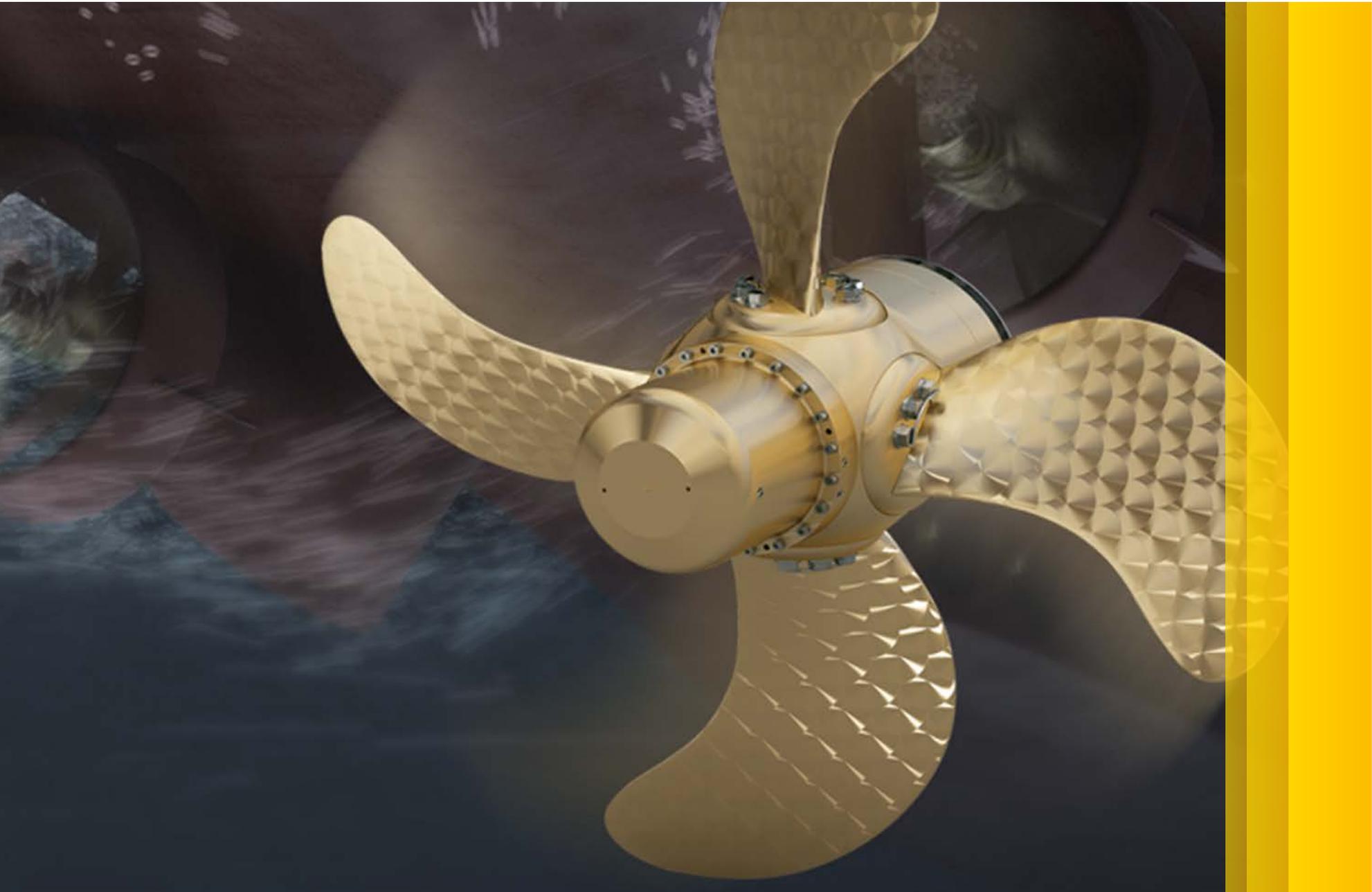
## **Marine Transverse Thruster, MTT**

Transverse thrusters are available with a selection of different controllable-pitch or fixed-pitch propellers. The MTT is available in two configurations: as high-power transverse thrusters (suitable for DP applications) and as auxiliary transverse thrusters for maneuvering in the port. The transverse thrusters have a diameter of up to 3.20 meters and are available for power outputs of up to 3.6 MW.



## **Marine Propulsion Control, MPC**

The MPC 800 remote control system enables operators to control and monitor all types of propeller application while delivering clear information based on graphic displays. It uses cutting-edge microprocessor technology and is a special development from Berg Propulsion. A range of operating modes can be individually configured using various combinator curves or constant speed.



# LNG SOLUTIONS – THE FUTURE FOR MARINE VESSELS.

SO<sub>x</sub> and NO<sub>x</sub> reduction will become one of the most important features for the marine industry in the near future. Shipbuilders and shipowners will have to ensure that their vessel meets all future legislative requirements to stay in operation. The Cat® LNG engines reduce SO<sub>x</sub> emissions by 99%, NO<sub>x</sub> emissions by up to 80%, and CO<sub>2</sub> by about 15%. Therefore, as soon as you are planning to implement a reliable, efficient and robust LNG system, consider contacting us.

**Key features:**

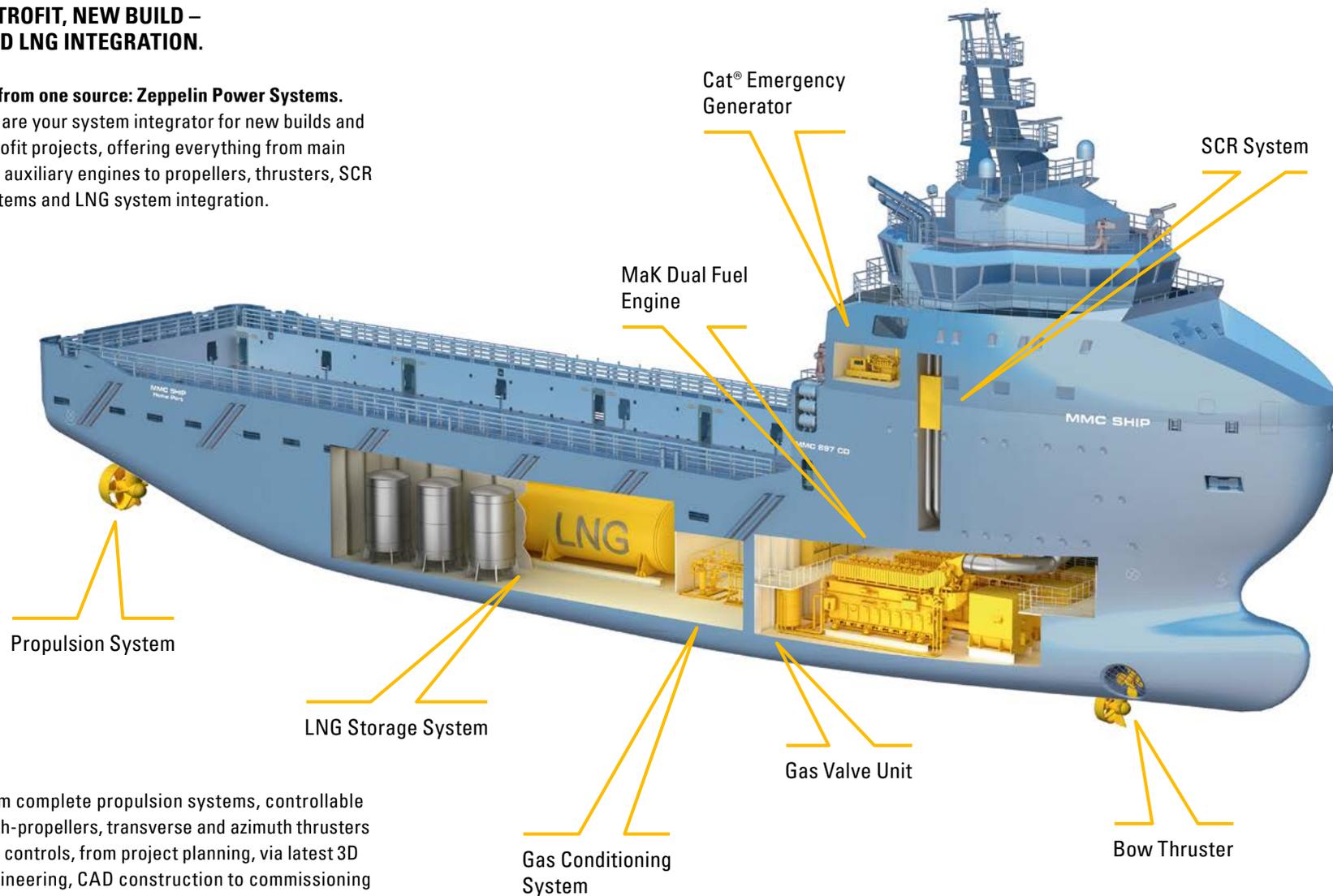
- Complete MCS-approved and certified solution
- IMO Tier III parent engine certification (Schema A), no additional certification on board the vessel necessary
- Combined development of SCR system and engine calibration for optimized performance and the lowest operating cost
- Corresponding maintenance schedule for the SCR system and engine for optimized operational availability



**RETROFIT, NEW BUILD –  
AND LNG INTEGRATION.**

**All from one source: Zeppelin Power Systems.**

We are your system integrator for new builds and retrofit projects, offering everything from main and auxiliary engines to propellers, thrusters, SCR systems and LNG system integration.



From complete propulsion systems, controllable pitch-propellers, transverse and azimuth thrusters and controls, from project planning, via latest 3D engineering, CAD construction to commissioning and 24/7 service around the world and 365 days a year.

**We work with you to find the best solution for your specific application.**

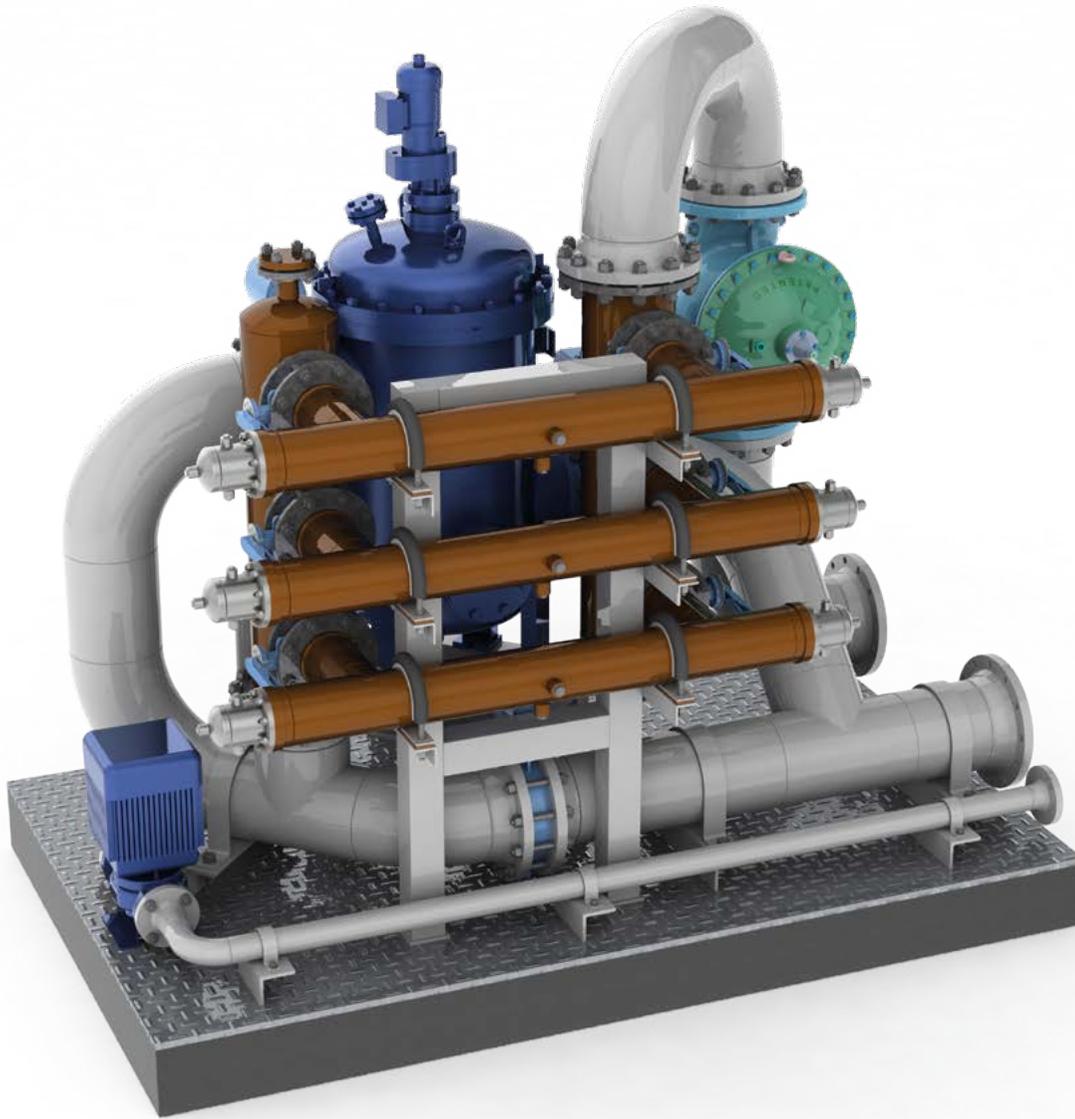


# OPTIMARIN BALLAST SYSTEM – SUSTAINABILITY FOR THE WORLD'S OCEANS.

The IMO Ballast Water Convention entered into force in September 2017. As of January 2016, all ships arriving in the USA must also have ballast water treatment on board.

The Optimarin Ballast System provides our customers with IMO- and US Coast Guard-approved technology. The technology is based on filtration and UV irradiation and has already been installed successfully on hundreds of ships worldwide.

As an official partner of Optimarin, Zeppelin offers shipyards and owners complete planning, realization, and delivery, from customized systems to complete turnkey solutions, supported by worldwide, on-site services for ongoing operations.



 Optimarin®

The Optimarin system is a ballast water treatment system which does not use or produce chemicals or biocides during its operation.

The small and simple systems can be flexibly integrated both on board existing ships as well as on new builds. The Optimarin Ballast System is certified for all salinities (fresh, brackish and seawater). The modulated system is very flexible – with a small footprint and weight, it fits vessels of all kinds and sizes.

The system can be delivered as a standardized complete skid or as a customized solution. Capacities ranging from 50 m<sup>3</sup>/h to 3,000 m<sup>3</sup>/h can be treated with the Optimarin system without problems.



## CAT<sup>®</sup> CONNECT – INTELLIGENT MACHINE AND FLEET MANAGEMENT.

### **Get the complete overview of efficiency and performance**

With Cat Connect, Caterpillar provides a clear state-of-the-art tool for analysis, consultancy and diagnostics for all maritime vessels – customized to your individual needs. With Cat<sup>®</sup> Marine Asset Intelligence (MAI) you get a complete overview of the efficiency and performance of your machine, system or fleet.

Cat<sup>®</sup> MAI provides system analyses based on the data evaluation of nearly 40 million marine engine hours. Alongside the analysis and consultancy for the operation of the engines, it also provides even more flexible functional overviews such as the condition of the engine, its fuel performance, and safety. It enables the monitoring of diesel engines from Caterpillar and other manufacturers as well as other parts and resources.



## 24/7 SERVICE.

Outstanding customer support for good value throughout the lifecycle – we support you at every step: from the sale and successful commissioning and beyond, you receive personalized service and aftersales service worldwide.

From maintenance and repairs to various stages of service and warranty contracts and the management of entire fleets – our service products help you to guarantee minimal downtime and maximum productivity for your vessel or system.

**Available to you worldwide – in the Caterpillar dealership network, in the Zeppelin company group or directly through our service center – we are here for you!**



# ACHIM FACILITY.

Visit us at our modern production and training site in Achim, near Bremen, in Germany. Here, we offer our customers the following additional benefits and services:

## TRAINING

In our advanced training center in Achim, we provide our customers with high-value technical training. We offer specialist training specific to your application; you determine the scope and will have a dedicated trainer as your point of contact.

## STATE-OF-THE-ART TEST BEDS

We have eight state-of-the-art test beds available at our Achim site. Factory acceptance tests are carried out here for each new engine. Three separable cells provide an opportunity for individual test runs for all mechanical and electrical power tests up to 6,000 kWel. If you like, you can attend the test rig run – and, of course, we will provide you with comprehensive service documentation to verify the process.



**By the way,**  
all manufacturers of machinery (OEMs) can test and improve their units on our test rigs.  
**Contact us!**



# CERTIFICATION AND AWARDS.

## **PLATINUM AWARD FROM DNV GL FOR ZEPPELIN POWER SYSTEMS CAT AND MAK**

### **We are one of the best:**

Zeppelin Power Systems has been awarded with the highest level of recognition by the classification company DNV GL for first-class customer service in the Cat and MaK divisions. Worldwide, we are one of three Caterpillar dealers to receive this award.

## **WE FOCUS ON CLEAN SOLUTIONS: AWARD FOR CONTAMINATION CONTROL**

We have been audited according to the Caterpillar contamination directive and given a 4-star rating. Contamination during maintenance or repair leads

to risks of breakdown or machine wear. Our repair work is undertaken in accordance with the strictest standards and regulations, in order to avoid the possibility of contamination of your machinery during maintenance and repair.

## **CERTIFIED ENERGY MANAGEMENT**

GUTcert certified Zeppelin Power Systems as having an effective energy management system in December 2016. All German companies belonging to Zeppelin GmbH were certified at this time.

## FASTER AIR FREIGHT DELIVERIES FOR YOU

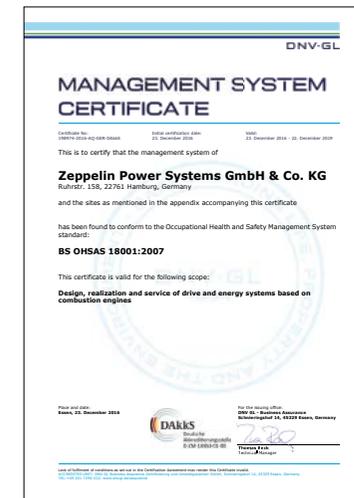
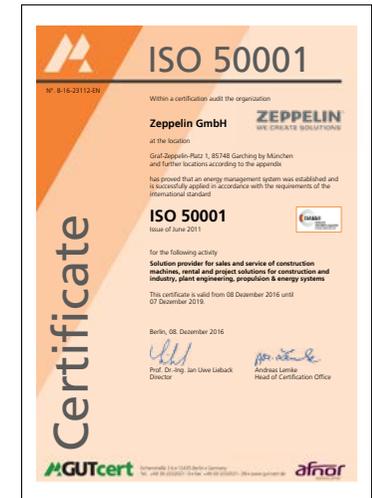
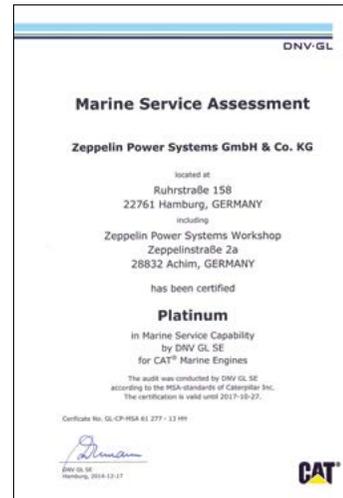
Zeppelin Power Systems is confirmed as a “Known Consignor” in Germany in accordance with EU Commission Regulation 185/2010. The certification is provided by the Luftfahrtbundesamt (German Aviation Authority, LBA) and is evidence of a completely verifiable, secure supply chain and compliance with all security requirements and standards for air freight deliveries. From now on, these will no longer require additional security controls at airports, enabling faster processing. This provides our customers with multiple benefits: Costs for security controls are reduced on account of the secure supply chain. The goods remain in their original, proper packaging and fast delivery times can be maintained, thereby avoiding unnecessary delays.

## CERTIFIED QUALITY MANAGEMENT AS A MATTER OF COURSE

Our customers’ satisfaction is of great importance to us. For that reason, our quality management systems ensure optimal services and products, designed to inspire you. However, we are not satisfied with simply staying on the course; we also want to constantly improve the range we offer. We therefore have our quality management system monitored by DNV GL, and are certified in accordance with DIN EN ISO 9001.

## OUR OCCUPATIONAL SAFETY AND HEALTH PROTECTION SYSTEMS ARE ALSO CERTIFIED

We also have our occupational safety and health protection systems externally monitored to ensure that our workforce can work safely for you. Since 2016, we have also been certified in accordance with BS OHSAS 18001.



# REFERENCES – ON ALL THE SEVEN SEAS AND BEYOND.

For seagoing vessels, mega yachts, inland waterway ships and workboats – customers worldwide rely on our experience, engineering competence and broad marine solutions portfolio for their application.



**Recreational Boating and Yachting**  
2x CAT 3512, 3x CAT C18, 1x CAT C9



**Inland Waterway**  
2x CAT C32, 2x CAT C18, 1x CAT C7.1



**Offshore**  
6x MaK 9 M 32 C, 1x MaK 9 M 20 C, 1x CAT C32



**Tug and Salvage**  
2x MaK 8 M 25 C, 4x CAT C9, 1x CAT C4.4



**Governmental**  
1x CAT C32



**Fishing**  
1x MaK 6 M 20 C, 2x CAT C18, 1x CAT C9



**Dredge**  
4x CAT 3516



**Cargo**  
2x MaK 8 M 46 DF, 2x MaK 6 M 34 DF



**Ferry and Cruise**  
3x MaK 12 VM 43 C, 1x MaK 12 VM 46 DF, 1x CAT 3516

# SOLUTIONS YOU CAN COUNT ON – THERE FOR YOU 8,760 HOURS A YEAR.

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**LET'S DO THE WORK.™**

**ZEPPELIN®**  
Power Systems

