

Caterpillar Presence at SMM Hamburg 2010

Your Success. Our Commitment.

Overview

Caterpillar Marine Power Systems, together with representatives from Cat Financial and the global Cat dealer network, will feature a wealth of solutions with an increased focus on the company's commitment to sustainable development at SMM Hamburg 2010.

In 2010, "Your Success. Our Commitment." will be the overarching theme for the Caterpillar stand at SMM – promoting the company's dedication to work with the customer to achieve their goals. Under the headline "Sustainable Solutions for Your Success," Caterpillar will promote its commitment to sustainable development. All of the products and services to be highlighted at the show booth influence the support of customer needs while also supporting sustainability and environmental protection.

Each of the subsequent individual documents supports the four key focus areas for the exhibition stand:

- Responsibility and Reliability: our dedication to safety
- Reengineering and Recycling: innovations in maximizing resources
- Reaching Out and Renewing: we are where you are, with what you need
- Reflecting and Reducing: intelligent ways to minimize costs

These four focus areas underscore the intense focus on developing solutions that will fulfil customer requirements without sacrificing the sustainability goals of customers and Caterpillar. Please reference the individual documents to learn more about our Caterpillar and visit us at SMM 2010 at Hall A4, Stand 210.

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For more information, visit MARINE.CAT.COM

For Worldwide Release: August 1, 2010

Release Number: M20PR10

Caterpillar Poised to Reach IMO III Requirements for MaK Marine Engines

Pioneering today for a cleaner tomorrow.

As the global marine industry continues to evolve based on increasingly stringent regulations, Caterpillar Marine Power Systems has been focused on maximising research and development to satisfy requirements whilst minimising the impact on owning and operating costs. The introduction of IMO II regulations from the International Maritime Organization (IMO) on January 1, 2011, will reduce the levels of Nitrogen Oxides (NOx) by approximately 20% in comparison to the current IMO I regulations. With these regulations in mind, Caterpillar Motoren, the manufacturing arm that manages the production of MaK engines in Germany and China, has fully completed a strategy to release IMO II-compliant versions of the four MaK engine series.

However, the MaK engineers in Kiel, Germany, are already looking forward to the next major regulations milestone which will impact the marine industry – IMO III regulations. This new set of emission requirements will be enacted on January 1, 2016, for Emission Control Areas (ECAs) to further reduce NOx emissions from marine vessels. While most engine manufacturers are expecting to meet IMO II standards through combustion process optimization, reaching IMO III standards will typically require a great deal more engineering and development from the engine manufacturer.

MaK engineers are currently developing and testing a range of the following four solutions, which will be part of a “tool box” offered to customers to assist in meeting IMO III regulatory standards. While none of these solutions are fully developed at this time, engineers at Caterpillar Motoren believe that the final solution offering for customers to meet IMO III standards will be a package of one or more of these solutions, based on individual customer needs. Further testing will ensure full compliance with the IMO III standards without sacrificing performance levels on the MaK engines. The following key technologies depict some of the most prominent solutions that are being tested.

Exhaust Gas Recirculation (EGR)

EGR is an “on engine” technology which recycles part of the exhaust gas stream back to the air intake side after cooling and scrubbing. The technology reduces the NO_x levels and may provide a path towards reaching IMO III required NO_x levels. Testing by MaK engineers is currently on-going to ensure a suitable outcome. The advantage of EGR is the potential, together with other ‘on engine’ developments, to have an IMO III compliant engine without further after-treatment. In turn, the added technology increases the engine complexity, impacts fuel consumption and may include sensitivities to certain fuels with higher sulfur levels. Additionally, the EGR concept works hand in hand with other internal measures such as common rail fuel injection, series turbocharging and other carefully interwoven developments.

Selective Catalytic Reduction (SCR)

SCR is an aftertreatment technology which uses an additional agent (urea) to reduce NO_x levels at least to IMO III levels. For customers operating both inside and outside of protected or controlled emission areas, the SCR option may be optimal, as the technology can be switched on and off as necessary to meet local regulations. Thus, the SCR solution promotes sustainability by limiting emission output as long as a certain temperature (typically around 320° C) is maintained to maximize the efficiency of the technology.

Scrubber

Scrubber is an aftertreatment technology to reduce sulfur levels in the engine exhaust when low sulfur diesel is not available. Various scrubber technologies exist, which extend to areas such as wet scrubbers, dry scrubbers and plasma technology, which can reduce fuel costs by allowing customers to purchase normal diesel fuel and reducing the sulfur levels, rather than purchasing the typically more expensive low sulfur fuel. While global sulfur limits vary, the limits are going down step wise over the next years so the need to reduce this emission will become quite important.

Dual Fuel

Dual Fuel is an engine technology that allows the engine to run on a combination of both diesel fuel and gas to reduce NO_x, SO_x and CO₂. The current challenge for this strategy is the low global infrastructure established for gas distribution, the ongoing development of a regulatory framework, and the ongoing development of Marine Classification Society (MCS) approvals. However, there has

been a clear increase in interest from the global marine industry into the dual fuel option, and Caterpillar Motoren has launched a New Product Introduction (NPI) project to develop a dual fuel engine with a pilot launching in 2014. The dual fuel strategy has clear environmental commitment for customers.

For more information about MaK power solutions, visit your local MaK dealer or visit MARINE.CAT.COM.

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More information is available at: MARINE.CAT.COM/pr

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For Worldwide Release: August 1, 2010

Release Number: M21PR10

Unique Tilt Testing Demonstrates Reliability of MaK M 32 C Engine

Reliability and safety at 25° tilt.

Earlier this spring, Caterpillar Motoren set out to complete a unique test accomplishment before launching the MaK diesel engine line for the offshore petroleum market – a 25° tilt test. While the MaK brand has been recognized for decades for extraordinary reliability in marine applications, the launch into the oil and gas industry prompted the desire for the additional test to demonstrate the reliability for the benefit of the customer.

To obtain a certification from a global Marine Classification Society, such as Det Norske Veritas (DNV), an engine manufacturer is required to demonstrate the 22.5° inclination capability for rolling motion (side to side) that can easily occur when a vessel is on the open seas. This can be proven through simulation and calculation. In fact, only the Norwegian Marine Directorate (NMD) requires a physical test for semi-submersible drilling platforms in offshore applications. However, the physical completion of the 25° tilt test further confirms the reliability and durability of the MaK VM 32 C engines and generator sets, which have the highest piston speed of all MaK engines. The engine is in compliance with the highest inclination regulatory requirements, such as the 25° inclination in all directions, which can be now assumed for all four MaK engine lines.

The testing was completed on an IMO II-compliant MaK VM 32 C generator set over 35 days at the engine center in Rostock, Germany. Known for its state of the art testing center, including six test beds for the testing of every MaK engine manufactured at the facility, the Rostock employees completed the test, which logged more than 100 hours on the test engine, far greater than the four hours required by the NMD.

“While many of our competitors choose to complete the same requirement by using computer-driven simulations, we sought out to really uphold our promises regarding engine reliability by completing the physical test at an actual test cell,” explains Jens-Peter Reinkens, Facility Manager at Caterpillar

Motoren in Rostock. "We were pleased to see such fantastic results from the VM 32 C test, and we are now in the process with the Marine Classification Societies to gain the same certification for our other MaK engines as well. This really demonstrates the true value for the customer in terms of reliability of MaK engines for both the marine and petroleum industries."

As recent events in the petroleum industry demonstrate, safety while at sea can quickly be threatened for even the most experienced employees. Thus, the additional steps taken to complete the comprehensive tilt test further demonstrate the focus on safety by Caterpillar for all customers and employees.

For more information about MaK power solutions, visit your local MaK dealer or visit MARINE.CAT.COM.

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<p>MaK 12 VM 32 C Generator Set on the Test Bed in Rostock, Germany</p>	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageId=C609822</p>
<p>MaK 12 VM 32 C Generator Set on the Test Bed in Rostock, Germany</p>	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageId=C609823</p>

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For Worldwide Release: August 1, 2010

Release Number: M22PR10

Upgrade Kits for Cat® 3500 Marine Engines Released for Global Sales

Upgrade technology, lower operating costs.

As previously announced, Caterpillar has heavily invested in engine development and proprietary technologies to meet exhaust emissions requirements around the world without sacrificing engine performance to continue meeting customer needs. One of these projects is the development of engine retrofit kits for the Cat® 3500 series of marine engines, which will allow customers to upgrade Mechanical Unit Injector (MUI) engines to Environmental Protection Agency (EPA) regulated levels.

Caterpillar Marine Power Systems is now pleased to announce the release of these retrofit kits at this time for sale in all countries not governed by the Environmental Protection Agency (EPA). Caterpillar is currently working closely with the EPA to gain certification for sale in the United States as soon as testing and analysis is completed. The sale of the kits will be managed through the global Cat dealer network and will begin shipping early in the autumn.

Aside from the clear environmental benefits of reducing emissions of carbon dioxide and NO_x, the upgrade from a mechanical engine to an electronic engine (through the addition of an electronic control module) will also have numerous performance improvements, including lower fuel consumption.

“Despite the variety of technologies which could be used to affect the requisite reductions in particulate matter, Caterpillar believes the engine retrofit option will prove most beneficial to our customers,” notes Terry Sears, Caterpillar Emissions Solutions Product Manager. “By upgrading a mechanical engine to an electronic engine, the operator will gain smoother operation, easier diagnostics, and improved fuel economy above and beyond reducing emissions. The ease of installation is also another win because the entire retrofit can be accomplished in hull without major modification of the design or structure of the vessel.”

Two kits will be available for customers interested in upgrading 3500 series engines to reduce emissions to Environmental Protection Agency (EPA) regulated levels:

- Pre-IMO I to IMO I regulated level / Pre-EPA Tier 1 engine to Tier 1 regulated level
- IMO I to IMO II regulated level / Pre-EPA Tier 1 engine to Tier 2 regulated level

The development of the upgrade kits underscores the focus from Caterpillar on helping customers reach their sustainable development goals. Caterpillar Marine Power Systems has long been a leader in environmental issues, allowing customers to focus on business progress.

For more information about engine retrofit kits from Caterpillar, visit your local Cat dealer or visit MARINE.CAT.COM/repair.

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Caterpillar technician servicing a Cat® 3508 marine engine	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageld=C172753</p>

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For Worldwide Release: July 16, 2010

Release Number: M23PR10

Quick Turnaround for Marine Engine Overhaul Demonstrates Commitment from Cat® Dealer, Aids Gulf of Mexico Oil Crisis

Commission from BP requires a rapid overhaul for the Potomac to reach Louisiana in time for assistance with the oil spill.

As one of the leading petroleum transportation companies on the eastern seaboard of the United States, Vane Brothers has developed a strong reputation for ethical business and a commitment to sustainability in all aspects of their business. So after hearing news of the oil spill off the coast of Louisiana in the Gulf of Mexico, Vane Brothers quickly closed a deal with British Petroleum (BP) to supply six tug boats which would maneuver six 50,000 barrel barges next to the skimmers that are collecting the oil from the gulf before pumping the oil out of the skimmers for transport to a disposal point at an oil refinery.

While Vane Brothers, a marine transportation company headquartered in Baltimore, Maryland, was definitely supportive of the task, the commission from BP could not have come at a more inopportune time for the vessel the *Potomac*. Just three days prior, Vane Brothers had ordered a top end overhaul kit for twin Cat® 3516B engines onboard the *Potomac*. Unfortunately, when the direction from BP was that *Potomac* would be needed on the scene within weeks, Vane Brothers made a plea with their local Cat dealer, Alban Tractor, to complete the engine overhaul as quickly as possible so they could commit to assistance during the crisis.

To achieve this aggressive goal (the turnaround for an overhaul typically takes 25 days, including lead time for parts), fantastic teamwork was necessary between Vane Brothers, Alban, Caterpillar and CDS Transportation. First, the overhaul kit was ordered from Caterpillar Logistics Services in Morton, Illinois, USA, for parts to be packaged, shipped, and delivered. These parts were immediately transported by CDS Transportation directly to Alban, where the overhaul on both engines was then completed in just eight days, one-third of the normal turnaround time. The overhaul was thus completed in time for the

Potomac to be on its way to the Gulf of Mexico, where it arrived in time to join the other Vane Brothers boats in assisting with the situation.

“This was a definite success story do to the commitment of the Alban technicians and the Caterpillar staff that put forth the extra effort to get the parts and complete the work in support of this customer’s critical needs,” noted Rusty Steele, Marine Business Manager at Alban. “Faced with the confines to complete a ‘normal’ process with a quite ‘abnormal’ timeframe, both the Alban and Caterpillar teams worked through and around obstacles to get the job done. In fact, the Alban technicians completed the overhaul by volunteering to work on Father’s Day and 18-hour days throughout the overhaul.”

This commitment from Alban and Caterpillar underscores the exact reason why Vane Brothers has chosen Cat propulsion engines for the vast majority of their tug boat fleet – the assurance of quality product support from Cat dealers in all major ports of call. Congratulations to Vane Brothers and Alban for this fantastic accomplishment and providing assistance to this international crisis.

For more information about Cat power solutions, visit your local Cat dealer and visit MARINE.CAT.COM.

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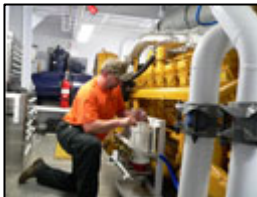
Cat® 3516B Marine Engine



High Res:

<http://xml.catmms.com/servlet/ImageServlet?imageId=C539357>

Alban technician inspects overhaul of Cat® 3516B marine engine on the Potomac



High Res:

<http://xml.catmms.com/servlet/ImageServlet?imageId=C609602>

Tug boat *Potomac*, which completed an overhaul on the twin Cat® 3516B engines



High Res:

<http://xml.catmms.com/servlet/ImageServlet?imageId=C609603>

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Release Number: M24PR10

MaK Engine Overhaul Demonstrates Continued Reliability of the VM 43 C Marine Engine

Scheduled maintenance for reliability and longevity.

Since launching in its first marine application in 2000, the MaK M 43 C medium speed diesel engine has become not only the most demanded engine from Caterpillar Motoren, but also one of the most reliable and durable. Built at the Rostock assembly facility in Rostock, Germany, about 600 engines in both inline and Vee-configurations have followed over the past ten years to be installed in a variety of applications, including cruise, ferry and cargo vessels. With upwards of ten years of service on the books, many of these M 43 C engines are now passing the first major maintenance hurdle – the 30,000 hour mark.

To inspect the overall quality of the engine components, engineers from the Kiel Engine Center worked with Brittany Ferries, a French ferry company that operates between France, United Kingdom, Ireland, and Spain. The *MV Pont Aven*, which was put into service in 2004 as the first marine application of an M 43 C in Vee-configuration, is powered by four 12 VM 43 C engines, which generate 43 MW for the passenger ferry. The engines are in operation approximately 6,200 hours each year and constantly operating on Heavy Fuel Oil (HFO) 380.

During a scheduled overhaul just after 30,000 operating hours, MaK engineers were able to review the condition of various components on the engine to identify overall engine quality following this milestone. Several notable findings are listed below:

- Bearings – All main bearings were dismantled from the engine for inspection and exchange. The lower shells show the expected, even running pattern. No cavitation marks or other material ruptures were found. The upper shells show only a hardly visible, even running pattern. All bearings safely reached the operating hours.

- Connecting Rods / Piston Pin – No unusual wear marks were found, the wear pattern was even and within the expected range. The diameter of the piston pins was also measured for wear, but no wear was measurable. All parts were good for further use.
- Piston – All pistons were removed from the engines. No wear marks, fretting or other corrosion were found on the crowns or skirts. Over all cylinders, the calculated average wear rate of the first piston ring groove was 0.008mm/1,000 operating hours and on the average piston crown, the first ring groove had not even reached half the wear limit yet.

“The result of this maintenance is certainly a proof for the reliability and longevity of the inspected components of the MaK M 43 C, even under a highly demanding ferry operation,” explained Karl Vollrath, Customer Service Manager. “This inspection also clearly demonstrates how proper attention to the engines from knowledgeable operators and scheduled maintenance to the manufacturer’s recommendations can truly extend and maximize the life of these investments. The goal is simply to reduce total cost of ownership for the engines while retaining safety at sea – and I believe that these findings show that the VM 43 C clearly accomplishes both of these tasks.”

For more information about the MaK M 43 C engine, visit your local MaK dealer or visit MARINE.CAT.COM/mak-m43C.

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MV Pont Aven	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageld=C611242</p>

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For Worldwide Release: July 15, 2010

Release Number: M25PR10

Caterpillar Manufacturing Facility in Germany Recognized with Sustainability Award

Kiel Engine Center in Germany has been recognized with environmental award for the state of Schleswig-Holstein.

As the world's leading manufacturer of diesel engines, Caterpillar is committed to developing power systems solutions to meet customer needs. Along with a clear focus on the customer, Caterpillar has been focused for years on developing engines and generator sets that reduce the emissions levels produced during operation to meet global regulation levels. However, the work done at the Kiel Engine Center in Kiel, Germany, during the manufacturing process for MaK and Cat® engines up to 16,000 kW is now being recognized through an impressive environmental protection award.

In June, Caterpillar Motoren, the manufacturing arm focused on the production of MaK and Cat engines for marine, petroleum and power generation applications, was awarded an Environmental Award from the Economic Association of Schleswig-Holstein, the northernmost state in Germany. At a celebration including the governor of Schleswig-Holstein, Caterpillar was recognized for the enormous efforts on reducing energy consumption, resource reduction and elimination of green house emissions through the manufacturing process.

"This award truly underscores our commitment to sustainable development at the Kiel Engine Center specifically, and also at Caterpillar more generally," explained Richard Case, Vice President of the Marine and Petroleum Power Division, headquartered in Hamburg, Germany. "We have individual teams throughout our division working hard to help our customers be more sustainable in their operations and meet global regulatory requirements, and also to increase the sustainability in our own factory and office environments. We are very honored to receive this award which helps show the great progress we have made working towards our sustainability goals."

Specific actions noted by the nomination team for the award include changes to many of the buildings at the Kiel Engine Center, such as the installation of new cooling towers and replacement of lighting systems, both of which resulted in significant energy savings. For example, because all engines manufactured in Kiel are fully tested before shipping to the customer, the cooling system on the testbed is a vital process which requires a great deal of energy. A project was completed to automate the cooling process so that the previous manual control was replaced to individually cool the engine as necessary during different load ranges during the testing, thus aligning the cooling with actual demand. This work has already amounted to an annual CO₂ reduction by 525 tons or 58 percent less energy consumption of the cooling system.

For more information about the company's commitment to sustainability in the marine industry, visit MARINE.CAT.COM/sustainability.

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<i>Kiel Engine Center Representatives Receive Environmental Award from the German State of Schleswig- Holstein</i>	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageId=C609125</p>
<i>Assembly Hall at the Kiel Engine Center in Kiel, Germany</i>	 <p>High Res: http://xml.catmms.com/servlet/ImageServlet?imageId=C228343</p>

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For Worldwide Release: July 20, 2010

Release Number: M26PR10

Caterpillar Delivers Early on IMO II Compliance for MaK M 20 C Marine Engine

Caterpillar Motoren announces early availability of the IMO II-compliant configuration of the popular MaK M 20 C marine engine.

With the implementation of IMO II regulations for the marine industry on 1 January 2011, marine engine manufacturers are finalizing strategies and development for modifications on engines to meet the strict requirements. Caterpillar Motoren, the manufacturing arm of Caterpillar Inc. which manages the manufacture of MaK engines, has been working for nearly three years on a strategy for each of its four medium-speed engine series.

Now, nearly six months before the enactment of the IMO regulations, Caterpillar Motoren is announcing the advance availability of the IMO II-compliant configuration of the M 20 C medium speed engine. After months of focused work on the smallest MaK engine series, the M 20 C is available for purchase globally in both 6- and 8-cylinder configurations, both which meet the IMO guidelines. Based on the configuration, the M 20 C engine will produce between 1020-1520 kW at 900-1000 rpm and is capable of operating on Heavy Fuel Oil (HFO) or Marine Diesel Oil (MDO).

Manufactured at the Kiel Engine Center in Kiel, Germany, the M 20 C has been a very popular engine for a variety of tug and fishing applications around the world due to its high power output at a relatively small footprint. In fact, since its initial manufacture in 1992, more than 1,200 M 20 C engines have been manufactured and sold through the global MaK dealer network.

To meet the additional regulations, which are aimed at reducing engine emissions, specifically NOx, MaK engineers were able to make minor modifications to the engine to achieve the desired emission levels. The focus of the design changes to the engine is the injector pump, depending on the application, which

was redesigned with a new plunger for emission optimization in alignment with new timing for fuel injection, combustion inlet, and exhaust outlet. Additionally, the IMO II-compliant configuration utilizes redesigned gas piping to optimize the flow of exhaust gas. In the end, these engineering changes will ensure full compliancy without sacrificing efficiency or reliability for Fixed Pitch Propeller (FPP), Controllable Pitch Propeller (CPP), or variable speed auxiliary and generator set configurations.

Along with new builds coming from the Kiel Engine Center, a retrofit kit is also available for existing 6- or 8-cylinder M 20 C customers who are looking to meet the IMO II regulatory requirements.

The other MaK medium-speed engine series are currently in the testing phase of the New Production Introduction (NPI) process and will be fully IMO II-complaint and available for sale world-wide on by the end of 2010.

For more information about the MaK M 20 C engine, visit MARINE.CAT.COM/mak-M20C.

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About Caterpillar Marine Power Systems

Caterpillar Marine Power Systems, with headquarters in Hamburg, Germany, groups all the marketing and service activities for Cat and MaK marine engines within Caterpillar Inc. The organisation provides premier power solutions in the medium- and high-speed segments with outputs from 93 to 16,000 kW in main propulsion and 10 to 7,680 kWe in marine generator sets. The sales and service network includes more than 2,100 dealer locations world-wide dedicated to support customers in ocean-going, commercial marine and pleasure craft wherever they are.

More information is available at: MARINE.CAT.COM/pr

About Caterpillar

For more than 80 years, Caterpillar Inc. has been making progress possible and driving positive and sustainable change on every continent. With 2009 sales and revenues of \$32.396 billion, Caterpillar is a technology leader and the world's leading manufacturer of construction and mining equipment, clean diesel and natural gas engines and industrial gas turbines.

More information is available at www.cat.com.

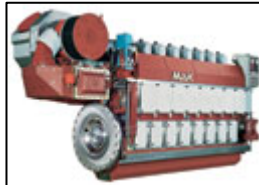
CAT, CATERPILLAR, their respective logos, MaK, "Caterpillar Yellow", the "Power Edge" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

Image Downloads

Click On Images Below for High Res

**Most images are provided in .EPS format for high quality, appropriate software will be needed to open the zip file

MaK 8 M 20 C Marine Engine



High Res:

<http://xml.catmms.com/servlet/ImageServlet?imageId=C609662>

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Cat® Common Rail System

Higher efficiency with lower fuel costs

Executive Summary

In 2004, Caterpillar Motoren, the division within Caterpillar focused on the development, design, engineering and manufacturing of MaK medium speed engines, began a development program for a common rail solution. Applied for several years on smaller diesel engines, a common rail system improves the typical fuel injection process by replacing the multiple fuel pumps, one for each cylinder, with a single high pressure fuel pump which feeds a fuel distribution rail. This change to a distribution rail offers not only greater operating flexibility without sacrificing reliability or safety, but also better overall fuel consumption. In order to meet future emissions regulations, such as the IMO III legislation in 2016, common rail will become an integral part of engine emission reduction technology.

Process

The three major improvements through the Cat Common Rail technology are the addition of electronic components, improved combustion and the reduction of the number of mechanical fuel pumps:

- The installation of a standard Cat ADEM™ 4 control system and two PL1000E communication modules takes the mechanical MaK engine to an electronic engine for improved performance and reliability
- Developing a fuel system that has a supply pressure independent of engine speed allows the operating profile and specific fuel consumption to be more efficiently matched to the required engine load, providing increased flexibility to the operator
- The number of fuel pumps is reduced to one (plus a second fuel pump in case of emergency). This pump then fuels a common distribution rail which works with the electronic control system to supply fuel to the engine's individual injectors

The current Cat Common Rail system has created an excellent basis for the further development of electronically controlled injection systems of the future. The system has demonstrated its basic capability for heavy fuel operation under the severe conditions prevailing aboard a ship.

Caterpillar Motoren has been testing the common rail technology on the engine series and Cat Common Rail technology will be a viable option for many of the MaK engine series in the future.

Benefits

- *Sustainability*

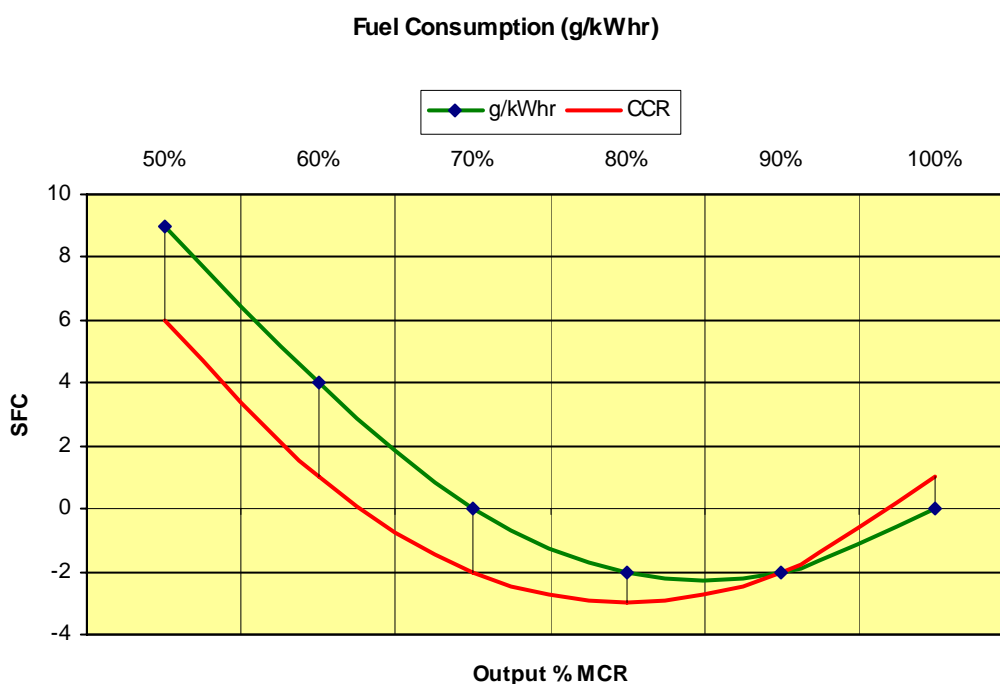
The Cat Common Rail technology is aimed at lowering operating costs and CO₂ emissions while meeting regulatory requirements. In fact, current analysis of a fleet of large container vessels estimates a potential CO₂ emissions reduction over 500 tonnes per year, bringing an additional and significant environmental bonus without sacrificing overall performance.

- *Quality & Reliability*

The MaK engines equipped in 2006 with the common rail technology have logged more than 8000 hours without major incident or significant equipment failure with very positive feedback from the operator. Thus, the common rail technology continues the legacy of reliability and dependability from the MaK engines.

- *Reduction in Total Cost of Operation*

By detailing the cost of engine operation and maintenance along with the fuel savings, the common rail technology demonstrates that the reduction in fuel consumption clearly outweighs the total cost of ownership – meaning an overall savings benefit to the operator.



For more information, visit MARINE.CAT.COM

Flex Cam Technology

Reduce soot and improve performance.

Executive Summary

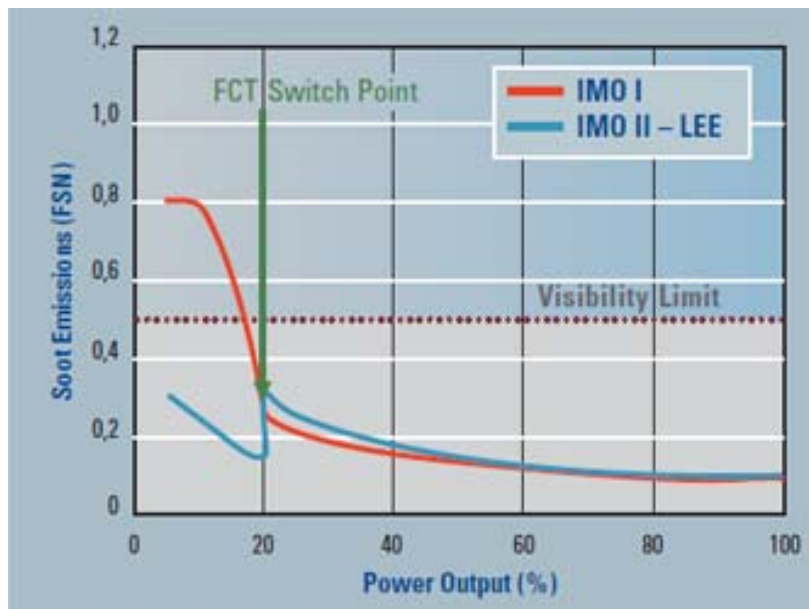
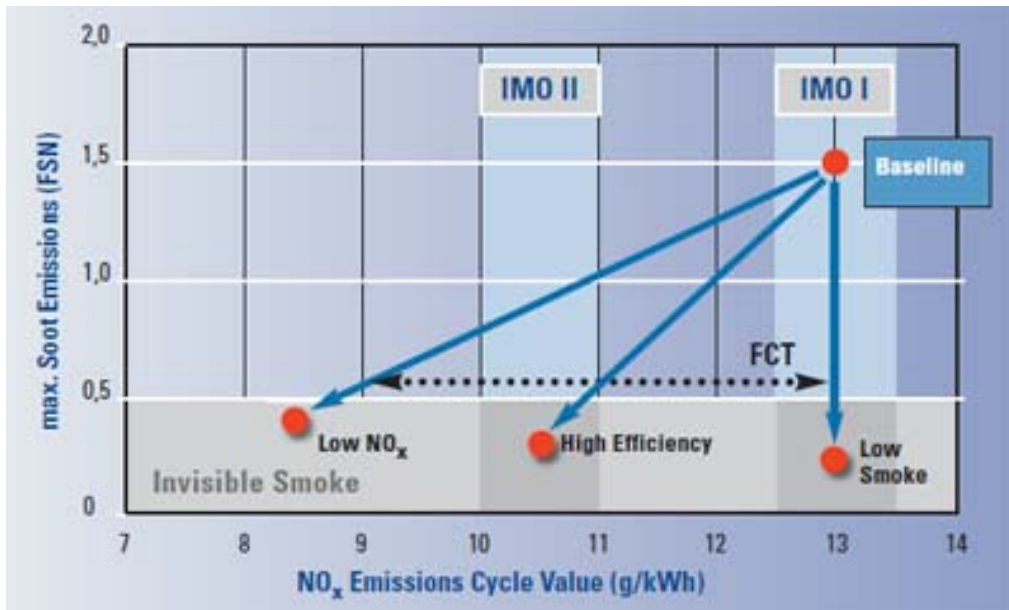
Building upon the Emission Reduction System integration concept, Flex Cam Technology (FCT) achieves synergy between flexible fuel systems and advanced air systems with maximum utilization of the current engine design. For customers operating in applications or harbors with more stringent legislative rules, the FCT technology reduces overall smoke emissions and improves load pickup and acceleration. One application that has been very receptive to the technology is cruise ships, where the MaK engines guarantee invisible smoke at all loads whilst maintaining NOx emissions in compliance with current IMO (International Maritime Organization) regulations. In addition, certain MaK engines can be easily converted to include FCT at any time if the operator desires.

Process

- While maintaining high fuel injection pressure over the whole operating range, fuel injection and inlet valve timing are load controlled and influenced by a lever shaft which affects injection timing/pressure and inlet valve events.
- Valve timing changes at part load to raise effective compression and enhance complete combustion.
- In addition, shifting the relative position of the lever to the fuel cam increases injection pressure, producing a finer atomization of fuel in a load range where it would otherwise be difficult to control smoke.

Benefits

By advancing the start of fuel injection and increasing injection pressure, combustion is improved and soot emissions are reduced by 50%. Shifted inlet valve timing switches off the Miller Cycle and contributes another 25% reduction in soot. Overall, MaK FCT reduces soot emissions at part load by 75% while improving engine performance during transient operation. The engine load required to activate the lever can be flexibly set according to the vessel operator's needs. Either way, visible smoke is eliminated while IMO standards are complied with at all loads.



For more information, visit MARINE.CAT.COM

Continuous Product Improvement

Continuous customer input, continuous improvement.

Executive Summary

While Caterpillar is renowned for outstanding product quality, work is consistently done to ensure that the quality is upheld over the life of the product. One of the major processes utilized throughout Caterpillar is Continuous Product Improvement (CPI), which allows dealers and service representatives to identify product issues through customers that need to be rectified for the individual customer and the entire engine population. This means that the factory is in frequent communication with customers to ensure their long term product satisfaction.

Process

- A repeat failure is identified by a Cat dealer or Caterpillar representative and logged into the CPI system – providing all necessary product information. This information is then scored along with other noted issues to identify the issue’s severity – including cost of repair, commercial impact, engine population, etc.
- To best understand the full grief the customer is facing with the product failure, a discussion with the customer often takes place to bring attention to the issue and communicate its importance to the customer view.
- CPI project is launched by a CPI Black Belt, who assigns a full team to investigate the issue. The 6 Sigma methodology is utilized to provide a strict process to identify and correct the root cause of the issue.
- The results from the project are communicated to global customers through a priority letter, which may require specific action. Cat dealers will also communicate with owners of the affected engine population. Thus, customers have peace of mind for a long term resolution of issues, including issues that have not even emerged.
- The solution is also implemented into the New Product Introduction (NPI) process to ensure that all future product development incorporates the change. The product is then constantly evolving to improve any issues that have been identified.

For more information, visit MARINE.CAT.COM

Genuine Cat® and MaK Parts

99% of parts shipped within 24 hours.

Executive Summary

Whether a customer is managing a single yacht or an entire fleet, having quick access to quality parts is critical for business or pleasure. It can make all the difference in keeping engines running and staying profitable. Genuine Cat® and MaK parts are engineered for a long life and maximum reliability because the same quality manufacturing processes are used for the engine and the spare parts. The sale of parts is managed through the Cat dealer network, so parts are available wherever and whenever needed. Investments into additional facilities and employees continue the improvement of parts logistics, including the launch of the MaK Spare Parts Logistics Centre in Henstedt-Ulzburg, Germany. This 15,000 sqm (161,450 sq ft) facility will increase velocity for parts availability to customers and reduce costs.

Benefits

- *Parts Availability*

Sales of MaK parts are available from a simple phone call to the local dealer, while Cat parts can also be purchased through the PartStore online system. Caterpillar also has strategically located 70 parts distribution centers in 24 countries on six continents shipping to more than 200 countries throughout the world to provide unparalleled availability. Over 99% of the parts ordered by Cat dealers are shipped from Caterpillar distribution centers within 24 hours.

- *Quality*

Cat engine parts are designed and manufactured to work hard as a complete system and be rebuilt for a second life. Design and manufacturing techniques are continually improved to ensure you get state-of-the-art new and remanufactured parts every time. Tests have consistently proven that the use of Cat and MaK parts (as opposed to competitive parts) greatly improves engine performance and reliability, and reduces overall owning and operating costs.

For more information, visit MARINE.CAT.COM

PartStore™

Efficient, quick, online parts ordering.

Executive Summary

PartStore provides a convenient way for customers to order parts from their local Cat® dealer, 24 hours a day, seven days a week. Customers don't have to leave their office or even pick up a telephone, reducing transportation costs and reducing printed paper. They would simply select the parts they need online and have them delivered directly to their job site. The PartStore system currently contains more than 800,000 genuine Cat parts – everything from new to remanufactured, Cat Classic™ Parts, and dealer exchange and used parts. PartStore is now available in two versions: PartStore Web and PartStore Integrated Procurement.

Process

Registration for PartStore Web is quick and easy, but must be completed through a local Cat dealer on their website. PartStore Integrated Procurement integrates with many ERP systems, including SAP, Oracle, and JD Edwards.

Benefits of PartStore Integrated Procurement

- *Easy access to parts inventory*
Through the existing Enterprise Resource Planning (ERP) system, customers can utilise the Cat PartStore System's Integrated Procurement version to access the local dealer's inventory without any Internet browser.
- *Real time pricing and availability*
Online order maintenance lets customers verify pricing, choose and confirm delivery times, and track and manage orders – all without making a phone call or visiting the parts counter.
- *Invoices are automatically reconciled*
Orders are forwarded directly from the ERP system to the Cat dealer's business system. These invoices are reconciled with original purchase orders to eliminate duplicate order entry and margin for error for improved order accuracy.

For more information, visit MARINE.CAT.COM

S-O-SSM Fluid Analysis

Maximize uptime, minimize costly repairs.

Executive Summary

Cat® S-O-SSM Services provide information to help customers make maintenance decisions, reduce owning and operating costs, and maximize component life. The S-O-S fluid analysis tests have been developed by Caterpillar engineers and chemists to identify problems before they become major repairs and protect against performance losses. By sampling both engine oil and coolants, this is a quick and easy program to help marine engines remain productive, and maximize the value of the investment. S-O-S Services combined with regular inspections, analysis of engine operating conditions, electronic data, and service history will enable you to evaluate the engine's overall health.

Process

The S-O-S Fluid Analysis process consists of two major parts: sampling and analysis.

- The maintenance program can be performed by the customer or a Cat dealer at any level of preventive maintenance that will keep the engine running at peak performance. This sampling method requires a Brass Probe and approximately 15 cm (6 in) of tubing. Using a new piece of tubing for each sample is critical to avoid contaminating other samples.
- Caterpillar engineers will then evaluate the conditions of the engine through several tests, including wear rate analysis, oil condition analysis, and oil contamination analysis. These tests are a snapshot of the engine oil and cooling system at the time of sampling but can also show or even predict major problems with the cooling system. These results are available quickly on the internet, as well as through email, fax, or mail.

Benefits

- *Accurate analysis using tests designed by Caterpillar for Cat engines*

Only Caterpillar engineers know exactly what metallurgical specifications were designed into each part and component. The accurate interpretation from the fluid samples are available quickly (typically within 24 hours of receipt of a sample) and provided from the engineers that know the engines best,

- *Limit down time and drive down costs*

S-O-S sampling and analysis identify particular engine component problems before errors are noticeable. Early detection is the key to reducing downtime and driving down costs.

Performance losses and major repairs of lubricated compartments can often be avoided by monitoring fluid samples.

- *Easy instructions to put results into action*

S-O-S Services results are presented in a clear, concise, easy-to-understand report. Trained personnel provide recommendations or specific, immediate actions on each report to review the most critical components, optimize a maintenance schedule and optimize component life.

For more information, visit MARINE.CAT.COM

Customer Support Agreements

Increase uptime and productivity.

Executive Summary

A Customer Support Agreement (CSA) is one of the most convenient and affordable ways for marine customers to take advantage of Cat® dealer resources, covering aspects of inspection, maintenance, and repair. A CSA is any arrangement between you and your Cat dealer that helps you lower your cost per unit of production. Agreements are tailored to fit your business needs and can range from scheduled inspections and preventative maintenance to before-failure overhauls. Every CSA has one primary goal: to save customers valuable time and money. In the end, a CSA is a partnership between a customer and a Cat dealer that will help you succeed by leveraging the equipment management expertise of Caterpillar.

CSA Options

- *Inspection CSA*

An Inspection CSA includes scheduled, highly specialized technical and visual inspections of the engines. Minor adjustments are made during the inspection and customers receive full diagnostic reports for each engine, as well as a list of recommended preventive actions.

- *Preventative Maintenance CSA*

A Preventive Maintenance (PM) CSA can cover all Cat or MaK engines regardless of age and usage hours. With a PM CSA, the Cat dealer takes responsibility for all maintenance based on the service intervals prescribed in the Operations and Maintenance manual. A PM CSA provides flexibility when arranging repair schedules and reduces labor overtime charges.

- *Total Maintenance & Repair CSA*

A Total Maintenance & Repair (TM&R) CSA provides complete coverage for new Cat or MaK engines. All maintenance and repair is placed in the hands of the Cat dealer, so customers have greater confidence in your engines' reliability and complete control over costs. A TM&R CSA means an end to the uncertainties of arranging and undertaking repair and maintenance, leaving highly skilled technicians to take care of everything.

For more information, visit MARINE.CAT.COM

Extended Service Coverage

Peace of mind, today and tomorrow.

Executive Summary

Extended Service Coverage with one of four valuable plans offers customers total confidence for the life of the engine. Plans for new, used, or overhauled engines are available with a wide range of deductibles and coverage term options. More importantly, all of the plans are backed by the expertise of Caterpillar trained service professionals and the guaranteed quality of Cat® parts.

Plan Options

- Platinum Extended Service Coverage: coverage for new engines
- Platinum plus Extended Service Coverage: coverage for new engines, plus: Cat controls, displays, and associated wiring
- Platinum Advantage Extended Service Coverage: coverage for used engines
- Platinum Overhaul Protection Coverage (OPC): coverage for overhauled engines

Benefits

- *Keeps customers on budget*
Helps to avoid unexpected costs for unexpected repairs by providing a hedge against inflation by allowing customers to lock in costs up front and budget the costs of unexpected repairs.
- *Maximizes productivity*
Trained dealer service technicians perform repairs accurately and get the engine back up and running quickly. Customers can manage to the bottom line by coupling a Customer Service Agreement with Extended Service Coverage for total maintenance & repair coverage.
- *Protects safety and meets regulatory requirements*
An Extended Service Coverage reduces the potential for injury during repairs by outsourcing the more challenging repair work to the product experts at the local Cat dealer, who have the training and tools to do the work safely, as well as returning the engine to original operating specifications to meet all mandated requirements.

For more information, visit MARINE.CAT.COM

Remanufacturing

Like new reliability and warranty, fractional cost.

Executive Summary

Marine Classification Society (MCS) certificates and approved IMO/EIAPP technical files are required for propulsion and auxiliary machinery aboard classed vessels and offshore applications. For years, Caterpillar has worked through the global Cat® dealer network to handle the ordering and processing of requests for such certificates for engines in dealer inventory and stock engines.

Caterpillar has now received IMO Supplemental Certificates from Germanischer Lloyd (GL) for Cat remanufactured NOx Critical parts for the vast majority of their engine families. With the increase of customers utilizing remanufacturing to support sustainability and their business goals, the availability of these documents is vital to ensure full compliance with MCS requirements.

Benefits

- Off-the-shelf availability
- Same as new warranty and quality
- Fraction of new price
- Lower owning and operating costs
- Worldwide availability

With a sustainable business model and a high-quality, lower cost product support option, Cat Reman is good for business, good for customers and good for the environment.

For more information, visit MARINE.CAT.COM

Global Dealer Network

Wherever and whenever, we are there.

Executive Summary

For more than 80 years, Caterpillar has been building the world's infrastructure and has helped drive positive and sustainable change on every continent. This success has been made possible through the partnership with a global network of Cat® dealers who manage the relationships with customers in their territory. Thus, while Caterpillar is manufacturing the equipment, power systems, and services worldwide, Cat dealers provide a local presence to discuss and develop solutions for customers in their territory. For marine customers, Caterpillar Marine Power Systems is continually working to ensure that the level of service is at a maximum level regardless of which port a customer visits around the globe.

Benefits

- *Superior levels of service and understanding*

Cat dealer employees have two major focus areas: understanding the Cat and MaK product line and understanding the needs of their customers. With more than 135,000 dealer employees globally, customers are insured top-notch quality for service and maintenance to ensure that the superior Cat products are working at an optimal level for the long run.

- *Parts Availability*

Global dealers contain an inventory of genuine Cat and MaK parts to ensure customers receive the necessary parts as quickly as possible. Additionally, many dealers allow customers to order parts from the convenience of their office or home through PartStore™, an interactive website that puts parts just a click away.

- *World-Class Parts Facility Network*

Caterpillar Distribution Services supports Cat dealers and customers through its world-class network of 20 facilities around the world, operating 24 hrs a day, 7 days a week, 365 days per year. This network is currently expanding and modernizing to increase capacity, velocity and provide quality parts through more efficient systems and common processes.

For more information, visit MARINE.CAT.COM