MAN PrimeServ

PrimeServ Digital Services

Learn how to digitalise your Marine & Power business

Let's accelerate the digital transformation of our industries

As one of the world's largest manufacturers of marine-propulsion systems – with some 50% of world trade moved by MAN engines – and with a significant share of the power-generating segment, MAN Energy Solutions and MAN PrimeServ, its after-sales division, keep their finger on the market's pulse and are keenly aware of the trends that affect the way business is conducted. With change, the market tends to react and adapt and continue in ever-more efficient ways.

MAN Energy Solutions is also an innovative company that is often responsible for introducing such change. This was the case when it made digitalisation a cornerstone of its strategy back in 2018, and when it introduced its key 'PrimeServ Assist' service solution the following year.

While the pandemic has since acted as an accelerator for digital transformation and increased the acceptance for digital services, PrimeServ had previously laid the groundwork and was prepared for such a different work environment. As a result, already today more than 150 customers are benefiting from MAN digital services, like remote service and digital training, and acknowledging that they are here to stay.

+100%

of investment in digital transformation expected from 2022 to 2025

Learn now in 3 steps how our digital approach works.

1   2   3

Advantages   Digital Services   Case Studies
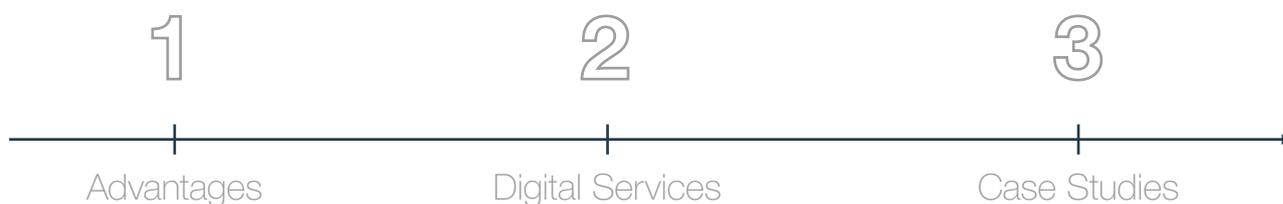
Advantages **1**

What advantages do digital services bring?

In the digital age, machinery generates vast quantities of data every single day. Remote servicing enables the exploitation of this wealth of data to – among other advantages – avoid downtime, optimise performance through data analysis, and anticipate customers' future needs.

Digitalisation takes advantage of sensors that measure every process and transmit/store the data instantaneously. The latest digital infrastructure technology supports in gathering data, advanced analytics allow real-time interpretation of it with the aim of interpreting it, and turning it into increased profits and a reduced environmental footprint. Greater and more sophisticated digital technologies such as autonomous plant operations, and more efficient electrical drives and controls, will assist these efforts.

Why are digital services gaining in importance?

While lockdowns and mandatory quarantines, have – as of late – become a new norm, MAN Energy Solutions was already well advanced in developing and introducing digital service solutions, including remote-service solutions. While the work environment for both MAN Energy Solutions' service engineers and its customers was altered drastically within a relatively short period of time, this has been in many ways for the better.

This disruption to the international community has sped up the acceptance of remote servicing and normalised it to a great extent as it represents a convenient way of retaining a customer's ability to maintain and repair their equipment through:

– fast reaction times;
– reduced equipment downtime;
– significant savings in travelling expenses and time.

Digital 2
Services

MAN PrimeServ

Digital services next level

PrimeServ offers a broad portfolio of digital services which can be accessed both: offline and online. Our aim is to support you anywhere and anytime. This could be by direct remote support or automated empowerment solutions.

We have a comprehensive digital infrastructure available, such as automation systems, connectivity solutions or cloud and edge platforms (MAN CEON) to accelerate the digital transformation and increase your competitiveness.
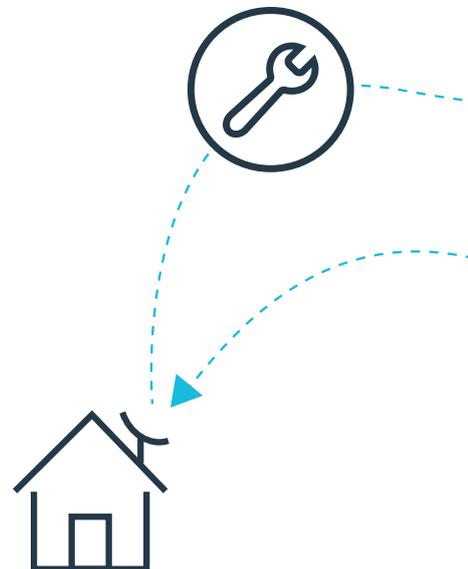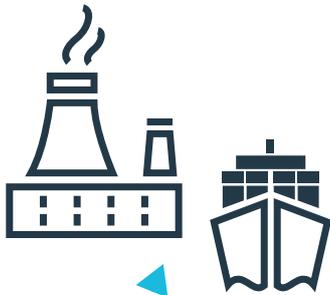
MAN Energy Solutions' current stable of remote-service solutions for four-stroke engines includes:

Our 4 part solution concept

#1 Advice & assist solutions
Pro-active advisory solutions based on the MAN CEON digital platform for machine data transmission, storage, processing and visualization (as well as on-demand 24/7 OEM expert monitoring

#2 Upgrade & customize solutions
Our soon-to-come software offering will update and upgrade (control) software based on customers' individual profiles and needs, enhancing engine operations and security

#3 Webshop PrimeServ MyPlace
Portal for easy access to technical documentation, spare parts ordering and shipment tracking

#4 PrimeServ eAcademy
Digital training solutions for personnel in the field

Digital service solutions by MAN

Advice & assist solutions

Customer equipment

Customer

Operation

Data

Advice

Reduce your OPEX

More uptime

Less performance degradation

Lower maintenance costs

Advanced analytics

Expert assistance
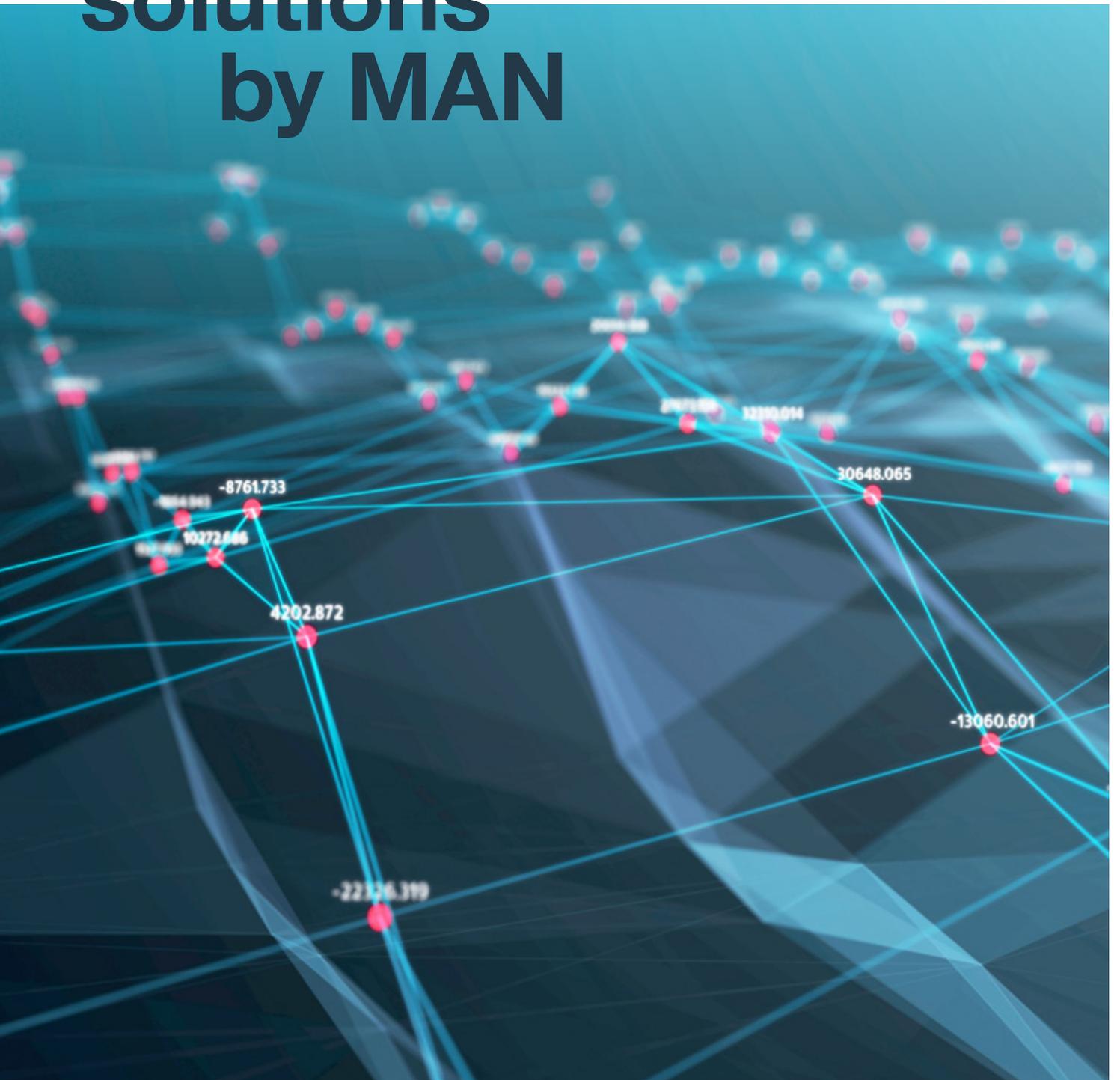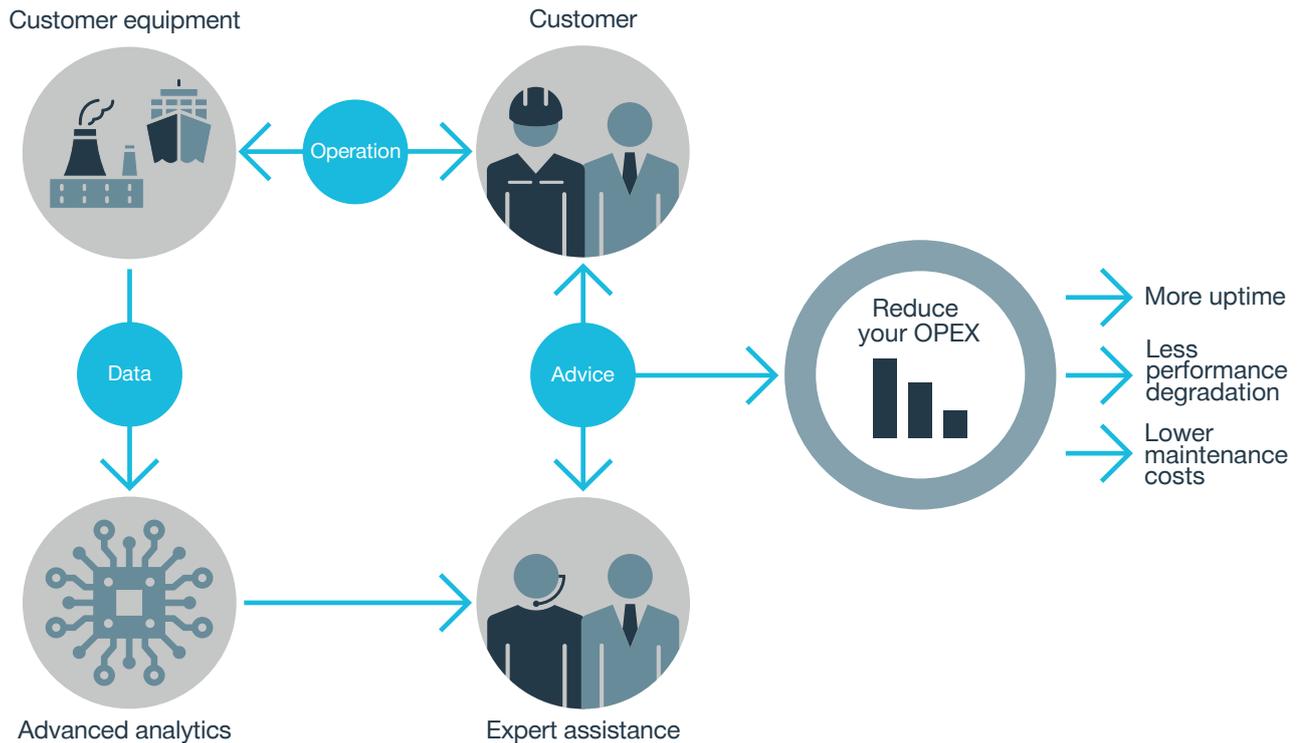
Ensuring engine availability is essential for today's business competitiveness and the best possible guidance for performance optimisation and trouble-shooting comes from the original engine designer. Using secure technology to connect to MAN PrimeServ's Remote Operating Centres, PrimeServ Assist is a proactive service solution – based on the MAN CEON digital platform – that constantly monitors and evaluates all parameters affecting engine perfor-mance. With the extensive data set and the history of the customer's en-gine at hand, service engineers sitting in Remote Operating Centres detect anomalies before potential breakdowns to optimise engine efficiency and en-sure equipment availability.

Since market launch in 2019, more than 80 customers – representing almost 600 MAN four-stroke engines and auxiliary systems – have already made PrimeServ Assist agreements

exploiting our advantage as OEM to optimise the availability, efficiency and maintenance of their equipment based on shared data.

PrimeServ Assist acts in different ways to optimise machinery performance to avoid damages or downtime. One way it achieves this is through ad-hoc notifications on engine performance (and auxiliary systems), including the type and severity of anomalies and recommended solutions. Another way is through newly developed, AI-based, advanced algorithms that predict the remaining lifetime of individual compo-nents and advise action accordingly.

PrimeServ service engineers also give recommendations on solving problems where appropriate with specific advice.

Data visualisation is an important el-ement of PrimeServ Assist that gives the opportunity to review on-screen charts generated from data collected

from your asset. These provide insights into engine performance and balance providing a basis for data-driven man-agement decisions. Similarly, historic data gives an overview of your engine's history to benchmark current engine performance against historical or even shop-test performance.

PrimeServ Assist also offers customers the use of 'write access'. This enables MAN PrimeServ superintendents to alter parameters in engine control-systems remotely and actively intervene where necessary. Ultimately, this access is controlled by the customer and secured against unauthorised intervention. This write access option makes it possible to change a parameter without travelling to the site, saving time and expense.

Recent Developments

Since late-2021, PrimeServ Assist has also become available for complete marine systems and the first customers are already on board such that the basic package now covers, not only the classic main engines, but also systems such as SCR, propellers, battery storage and gas-supply systems.

The derived data delivers further, in-depth knowledge to both the customer and MAN Energy Solutions on how MAN products interplay in practice. This, in turn, supports MAN Energy Solutions' R&D activities and can generate additional savings for customers in the ordering of retrofits, spare parts and technical-service jobs.

PrimeServ Assist is also venturing into machine learning to pre-identify the remaining lifetime of components – initially regarding the lifetime of spark plugs. It makes an estimation of spark plugs' remaining lifetime based on a prediction of component wear, itself based on an actual operating pattern derived from live data. As a result, this facilitates the on-demand exchange of spark plugs as opposed to general, scheduled maintenance. Such a system prevents unplanned outages through early planning for replacement and extends the component's useful life.

Add-on offerings

MAN PrimeServ aims to continuously increase PrimServ Assist's value for customers. The most recent example of this is the 'Lube-oil monitoring´ add-on that has recently become available for all MAN four-stroke, large-bore engines with the SaCoS control system. The add-on comprises an on-site MAN fluid-monitoring system that optimises lube-oil quality and recently helped an early adopter identify lube-oil quality issues at a power plant caused by an incorrectly functioning separator.

Another impending add-on is the so-called 'Performance Index'. This will give a visual indication of how optimally customers' equipment is operating – both at an overall level and for specific machinery – through colour coding and messages that prompt action where required. This Index incorporates several sub-indices, e.g., for turbocharger and cooling efficiency, and breaks our latest and detailed OEM know-how down into easily understandable numbers and advice. Further Add-Ons, targeting the reduction of emissions and maintenance cost, are currently being developed and will be ready for the market soon.

PrimeServ Automation Center

MAN Energy Solutions established the PrimeServ Automation Center in July 2021, whose premises offer the perfect environment for identifying and solving customer issues.
PrimeServ Automation Center's innovative portfolio includes a remote-service offering that reproduces and corrects faults to promptly offer customers definitive solutions to problems experienced in the field.

It also enables test setups to be carried out at hybrid workstations – all the way up to complete, functioning systems such as any of the SaCoS engine control systems – to maintain best practice with regard to customers.

EcoLoad

The operation of a plant with many components is a rather complex task. MAN EcoLoad is a standalone, digital tool that provides optimal operation advice for your MAN plants through continuous feedback on current statuses and recommends changes for greener and more economical operation.
EcoLoad's local and global optimisation functions visualise the potential for finding the optimal load distribution for your equipment, such as engines, gensets, and PTOs, individually or collectively with all information displayed with clear graphics and texts.

Upgrade & customize solutions

We believe in the power, robustness and reliability of our engines and we believe that they are made to last. But in a world that is changing fast and an industry with increasingly individualized demands, we know, it's the time for flexible solutions, that make our products last even longer and perform even better. That´s why we are introducing new Remote Upgrade and Update solutions to perfectly upgrade and update your equipment with flexible software features and special functionalities.

With our functionalities on demand, you only get what you need. The modules can be customized to your specific needs. With continious updates we guarantee you the best performance based on the lastest technical developments. Based on reliable enriched data, we make sure that your business and outcome stays reliable, predictiable and optimisable at any time.

Webshop PrimeServ MyPlace

MAN PrimeServ's 'MyPlace' is another digital service, a portal that offers increased efficiency for processes and workflows. It enables the placing, tracking and modifying of orders for spare parts and gives customers an invaluable overview of purchasing quotes, statuses and histories. It also grants instant access to critical technical documentation, as well as technical and after-sales support where necessary.
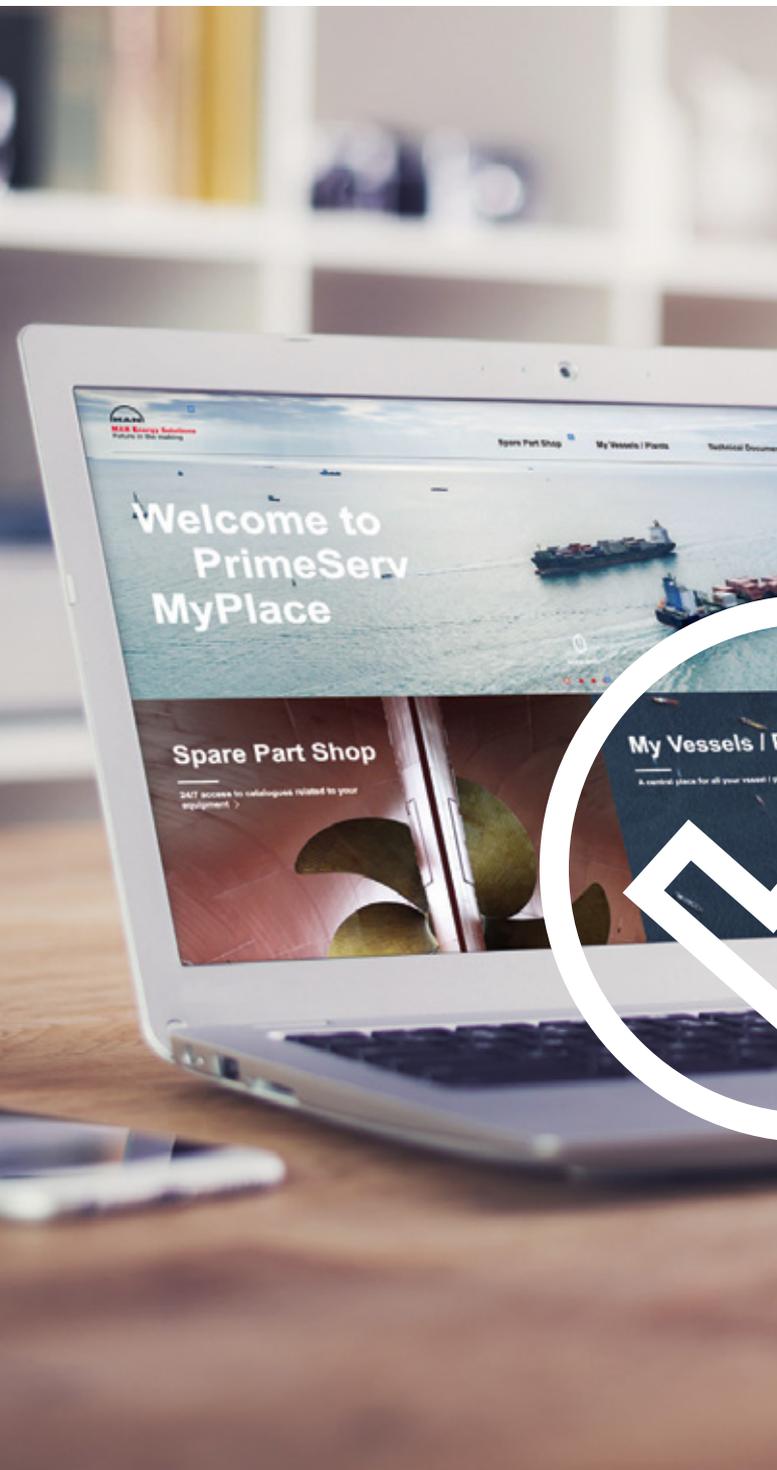
PrimeServ eAcademy

Digital Training and Courses

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**proficiency levels in
five areas of activity
ensure courses meet
you at your level**
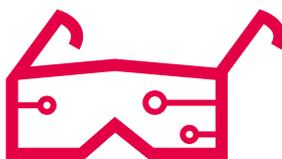
**To this point, this paper has discussed
remote servicing and the various solu-
tions available. This following section
explains how personnel in the field can
receive training and further education
using these tools.**

Virtual Reality

Blended learning (also known as hybrid learning) is a method of teaching that integrates technology and digital media with traditional, instructor-led classroom activities, giving students more flexibility to customise their learning experiences.

As an example, as part of their training, PrimeServ Academy students can wear a VR (Virtual Reality) headset, take a controller in each hand and virtually practice their skills on true-to-scale, virtual models featuring exploded views and X-ray vision, among other possibilities.

In virtual space, instructors can visually highlight view cross-sections or individual components for students, enabling important functions, work steps and questions to be explained and clarified directly on the model.
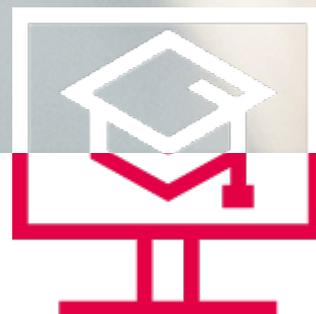
Simulators

Another training solution has been the development of a series of mobile training equipment units for specific training modules that can be shipped around the world to allow crew members to receive training as if physically attending a PrimeServ Academy training session. One of the first such demonstration units to be developed was a SaCoSone (engine control) simulator used for engine automation training.

Experience has subsequently shown that this form of real-time online delivery works well for both theoretical and practical elements, and that classes of between 8-10 participants can be managed with direct access to the lecturer hosted on a web meeting application such as MS Teams.

eAcademy

Besides instructor-based training, the MAN eAcademy provides training at a pace determined by the participant. By working through small, interactive eLearning modules, participants can educate themselves about, for example, SCR catalyst technology or engine fluids, from any location and at a time of their own choosing.

Proof-points

Digital services in practice
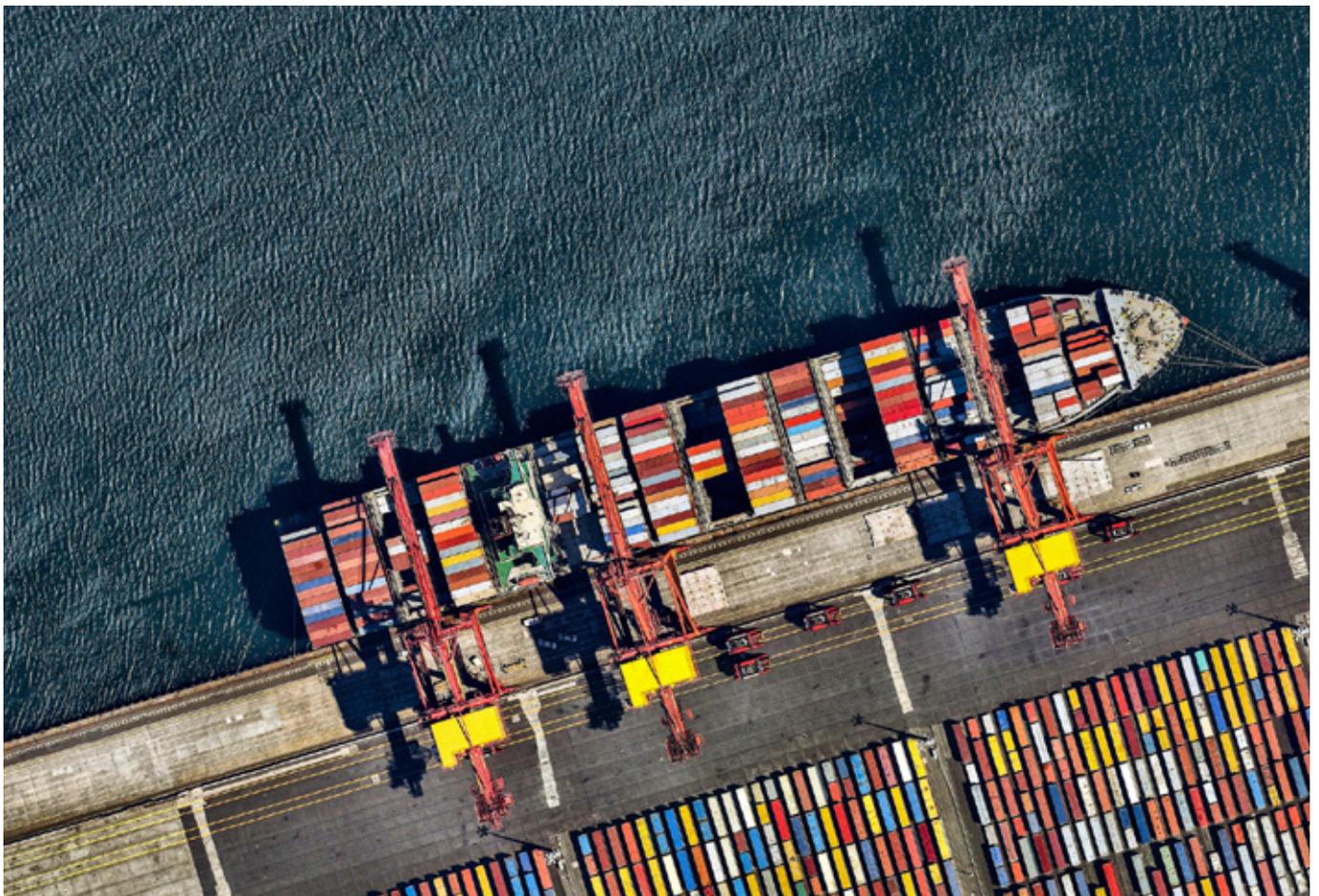
Marine Case Study:
Canada

A recent, confidential case from Canada involved a vessel built for a robust application that included an engine arrangement of 4 × MAN 6L32/44CR GenSets with GE generators and SCR systems.

On account of the Covid-19 pandemic, and in order to avoid the then mandatory 14 days of self-isolation period before Christmas for test personnel arriving from abroad, the pre-commissioning phase and first engine-start for each engine were successfully supported remotely from a remote service centre in Augsburg, Germany.

》 Necessary equipment on-site for remote operation included:

– a reliable and high-speed internet connection in the engine room, provided by the yard;

– a PC with internet connection and SaCoSone Service Token;

– ethernet cables and PCan adapter;

– AR/camera glasses, headset ear protection (communication while engine running).

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MAN PrimeServ Academies located worldwide

Microsoft's Quick Assist was used for remote control of the on-site computer as its response time is much higher than Microsoft Teams 'Remote Control'.

The exercise showed that untrained personnel can be supported by MAN superintendents, dispensing with travelling costs and compressing working time. It also showed that remote evaluation and release of data by superintendents during key steps in the commissioning process carried out by local personnel, such as load tests, can guarantee the quality of the commissioning process.

Digital Training Case Study:
SaCoSone simulators

Mobile training hardware is a perfect tool for training personnel in that they are easily shipped and it is possible to carry out a full training course with them that can match being physically present at a PrimeServ Academy course.

SaCaSone training for the MAN safety and control engine system was carried out in Australia over the winter of 2021/22. As travelling for a course to Germany would have been quite expensive and time-consuming for Australia-based participants, a digital solution was devised whereby courses were held locally with simulators shipped from Germany that October; the course instructor taught from Augsburg's PrimeServ Academy in Germany using the same simulator.
Teacher and class were connected via Microsoft Teams and PrimeServ Eye Tech.

》 The use of simulators proved very cost effective with PrimeServ Australia able to hold a number of courses in widely diverse locations that winter, including:

– SaCaSone courses for Serco Group personnel;

– training for personnel in Owen Springs, central Australia;

– qualification courses for PrimeServ engineers – held in parallel in Sydney and Perth at opposite ends of the country;

– Australian Navy

Once the series of courses was complete, the simulators were shipped back to Augsburg the following April.

Australian customer Testimonial

" Serco ASPAC invests heavily in training to build on the skills and expertise of our staff and as part of our management of Australia's new Antarctic Icebreaker **RSV Nuyina** (https://www.antarctica.gov.au/nuyina/), our Engineers and Electrical Technical Officers undertook a four-day SaCoSone engine-control-system training course hosted virtually by an instructor from the MAN PrimeServ Academy. Purpose-built SaCoSone simulators were flown in from Germany, which allowed our engineering team to get hands-on with this important aspect of the operation and maintenance of the MAN 32/44CR main engines installed on **'RSV Nuyina'**. The feedback from our engineering team has been very positive about the benefits of the course."

John East, **RSV Nuyina** – Operations Manager

Power Case Study:
Kenya

MAN PrimeServ O&M (Operation & Maintenance) operates and maintains the Triumph Power plant, featuring ten Himsen engines located in Kitengela, outside Nairobi, the capital of Kenya. A breakdown on one of the engines involving the replacement of a crankshaft and generator during 2020 led to capacity reduction, which PrimeServ O&M – along with the customer, Triumph Power Generation Company Ltd. – immediately sought a remedy.

Having assessed the root cause of the breakdown, MAN PrimeServ supported the customer with the identification and purchasing of the tools and spareparts necessary to repair the engine. Primarily, this involved replacing the engine's crankshaft and generator. However, with the team close to finishing the mechanical work on-site, the Covid-19 pandemic hit the region close to the power plant with ramifications

for civilian and business activity. In an uncertain situation, MAN PrimeServ decided to protect local O&M colleagues and to repatriate the Augsburg (Germany)-based commissioning-engineer and superintendent.

In the meantime, driven by the desire to find the best possible solution for the customer, MAN PrimeServ decided to execute an engine and generator commissioning remotely. The prerequisites, as agreed with the customer, were for continuous live communication (both visual and audio), and live operation data.

By involving the PrimeServ Assist services, access to real-time engine operation data was established via an MAN Datalogger Module (DLM), which can be connected to MAN CEON. Local use of the PrimeServ EyeTech solution then facilitated a remote video link to the Triumph engine room.

With reliable communication confirmed, commissioning proceeded with mechanical measurements and electrical tests followed through PrimeServ EyeTech with running advice from the remote operations centre in Augsburg. Similarly, coupling alignment and safety check-ups were verified remotely and all necessary documentation and test certificates drawn up.

Finally, the engine was started up with the commissioning team following every step and hot commissioning confirmed, including the full running-in procedure. The customer subsequently expressed its gratitude for an exceptional solution in such a unique situation.

exceptional solution in a unique situation

Outlook

Where to now for Digital Services? We are constantly developing PrimeServ Assist and its attendant services with the aid of artificial intelligence, machine-based learning, etc. In terms of software, we are committed to maintaining this newest generation of control system, fixing any issues, and providing updates and upgrades as required.

The next project in terms of digital learning is currently taking form at the MAN PrimeServ Academy in Augsburg, where an engine-room simulator can replicate different engine types, including a dual-fuel unit. Besides mimicking regular operation, failure scenarios can also be simulated to provide sophisticated training in trouble-shooting.

The course is performed as standard with instructor and participants sitting in a dedicated simulator room. However, as a next step, remote access will be provided so that students can take an online version of the course. This will still be fully led by the instructor and feature the same content but will negate the need for participants to travel to Augsburg, in the process saving unnecessary travel time and expense, as well as CO2 emissions.

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MAN PrimeServ – the service brand of MAN Energy Solutions